

https://dspace.org/

Law, regulation, and the promotion of renewable energy in South Africa

Murombo, Tumai

2016

http://hdl.handle.net/10539/22155

Murombo, Tumai (2016) Law, regulation, and the promotion of renewable energy in South Africa, University of the Witwatersrand, Johannesburg, <http://wiredspace.wits.ac.za/handle/10539/22155|>

Downloaded from a DSpace repository. https://dspace.org/



LAW, REGULATION, AND THE PROMOTION OF RENEWABLE ENERGY IN SOUTH AFRICA

by

TUMAI MUROMBO

thesis submitted in fulfilment of the requirements for the degree of

DOCTOR OF PHILOSOPHY (PhD)

in the School of Law at the University of the Witwatersrand

Supervisor

Professor Jonathan Klaaren
School of Law, University of the Witwatersrand

Co-Supervisor

Professor Jan Glazewski
Faculty of Law, University of Cape Town

School of Law
Faculty of Commerce, Law, and Management
University of the Witwatersrand, Johannesburg

DECLARATION

I, **TUMAI MUROMBO**, declare that this thesis is my own unaided work. It is submitted in fulfilment of the requirements of the degree of Doctor of Philosophy (PhD) in the Faculty of Commerce, Law, and Management at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

SIGNATURE ……

Tumai Murombo

STUDENT 215782

25 March 2015

This study commenced in 2009 and wherever possible the law is stated as at 30 November 2014.
The citation conventions of the South African Journal on Human Rights (SAJHR) were used.

Abstract

Many countries are under pressure to transition from fossil to renewable sources of energy. This pressure comes from multiple points including sustainable energy and climate change imperatives. The energy industry, especially electricity generation, is the main source of greenhouse gases, hence the significance of reductions in this industry. The purpose of this study was to conduct a legal analysis of the renewable energy law in the context of energy law generally in South Africa, to understand the regulatory function of law in promoting renewable energy. The study analysed government legal and policy positions, and the response by non-state actors to such policy positions and laws.

Through a qualitative analysis of primary and secondary sources of law and public participation documents, the study found that; while South Africa is committed to renewable energy, its socio-economic, cultural, and environmental context superimposes other priorities that impede progress towards renewable energy. Several obstacles to renewable energy were identified, some internal to energy law and others external to it, coming from other areas such as environmental law, governance, economics, and behavioural sciences. Analysis at the convergence of environmental and energy law revealed misalignment and fragmentation as major obstacles to renewable energy. While barriers are common across the globe, countries cannot apply the same responses with the same results. Regulatory responses, beyond the traditional 'command and control' tools are context specific and tools that have worked, in other countries, may not be as effective in South Africa. Socio-economic dynamics determine the legal responses to the barriers to renewable energy or the efficacy of economic incentives to promote renewable energy. However, overall, law and regulation can, and must, play a crucial enabling role by removing barriers to renewable energy. Nevertheless, there are limits to the use law 'as regulation.' Renewables will not replace fossil sources yet; rather in the long-term, renewables should become a big part of the energy mix. Despite gaining price competitiveness, it is too early for renewables to displace conventional fossil sources in a context of entrenched structural and institutional obstacles. Concomitant technical, market, economic, and environmental and resource governance interventions are necessary to effectively promote an energy mix substantially composed of renewables.

The study recommends that law should create an enabling regulatory environment for renewable energy. South Africa has not used law effectively enough to create this environment, thereby impeding the integration of renewable energy into its energy mix. Aligning energy and environmental law, among other incentives, can enhance this role of law. Legal reforms are necessary to remove the regulatory advantage afforded to conventional sources of electricity and level the playing field.

Acknowledgements

The biggest learning from my experience with doctoral research is that one needs more than ever before, colleagues to bounce ideas off, to get sympathy, inspiration, and the occasional kick to keep working on it. My supervisors Prof Jonathan Klaaren (Wits) and Jan Glazewski (UCT) (who voluntarily found time to co-promote my research) provided much of this. My family provided a lot of support and were very patient with me during my writing trances, thank you.

Financial support from the National Research Foundation (NRF) through Prof Klaaren came timely for my 2011 fees. The CLM, Faculty Research Committee (FRC) supported my participation at several international conferences to present on-going research, these include *Energy and Environment Summer Academy*, in German (2010, also partially supported by the DAAD) and Brussels (2013). The *Law and Society Association* through the *International Research Collaborative (IRC 20) Financial and Climate Crises: Global Regulatory Responses* also co-funded my participation in the Law & Society Conference in Hawaii at which I presented drafts of Chapter 5 and 6.

Earlier on, Wits Law School had enabled me to participate in the *Harvard Law Staff Exchange Programme*, 2010. The exchange visit proved very useful and provided me with opportunity to access excellent library resources and to present a public lecture on my PhD topic. The Harvard visit kick-started my earnest engagement with the research agenda.

Colleagues in the environmental law academic and civil society networks, IUCN Academy of Environmental Law, Pace Energy Law Centre, Environmental Law Association (ELA), Centre for Environmental Rights (CER), Zimbabwe Environmental Law Association (ZELA), Centre for Applied Legal Studies (CALS) – too many to mention by name – thank you all for the constant urging on at the various platforms we met. Special thanks to Prof Willemien du Plessis for taking special interest in my research, our several conversations on energy law and co-authoring with me a chapter on *Energy* in South Africa in a peer reviewed book in press.

Publications and conferences papers

During my research, the following peer-reviewed publications were published or are being published from parts, sections, or ideas in this thesis:

'Regulating energy in South Africa: Enabling sustainable energy by integrating energy and environmental regulation.' (2015) *Journal of Energy & Natural Resources Law*, http://dx.doi.org/10.1080/02646811.2015.1089113

Murombo T 'Green Economy, Sustainable Development and the Constitution' in Corder H, Federico V and Orru R (eds) *The Quest for Constitutionalism: South Africa since 1994* (Ashgate 2014) 227-240.

Du Plessis W & Murombo T 'Energy' Chapter 24, in Du Plessis A (ed) *Local Government and Environmental Law in South Africa,* (Juta & Co 2014*)* 885-916.

Conference Paper Presentations

The 12th Annual Colloquium of the IUCN Academy of Environmental Law, Rovira i Virgili University, Tarragona, Spain 30 June - 5 July 2014. Presentation: *'Legal and policy responses to renewable energy obstacles in South Africa.'* (Chapter 6 of thesis).

The 10th Annual Energy and the Environment Summer Academy – 'Climate Change and the Energy Challenge: Integration of energy efficiency and renewable resources' 15-21 September 2013, Brussels, Belgium. Presentation: *'Developing countries and the low- carbon economy: Regulatory responses to climate change in South Africa.'*

Law and Society Association, International Conference 2012: 'Socio-legal Conversations across a Sea of Islands' 4-9 June 2012, Hilton Hotel, Honolulu, Hawai'i USA. Presentation: *'Regulatory Constraints to the Transition to Renewable and Sustainable Energy in South Africa.'*

Harvard Law School and Wits Law School, Staff Exchange Visit, 19 September - October 2010. Public lecture topic: *'Renewable Energy Regulation: Promoting Sustainable Development in Developing countries'* 28 September 2010, Harvard Law School.

The 7th Annual Energy and the Environment Summer Academy, Greifswald University, Greifswald and Berlin, Germany, 18 July – 31 August 2010. Presentation: *'Regulation and Renewable Energy in Southern Africa: The Case of South Africa.'*

Abbreviations and Acronyms

COP	Conference of the Parties (to a treaty)
EIP	Environmental Implementation Plan
EMP	Environmental Management Plan
ERA	Electricity Regulation Act
FITs	Feed-in Tariffs
GG	Government Gazette
GHGs	Green House Gases
GN	Government Notice/General Notice
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
IRP 2	Integrated Resource Plan 2010-2030 (Nov 2013 update)
ISMO	Independent Systems and Marker Operator
JESA	Journal of Energy in Southern Africa
LJ	Law Journal
LR	Law Review
MPRDA	Minerals and Petroleum Resources Development Act
NEMBA	National Environmental Management: Biodiversity Act
NEMPA	National Environmental Management: Protected Areas Act
NEMWA	National Environmental Management: Waste Act
NEMA	National Environmental Management Act
NERSA	National Energy Regulator of South Africa
NWA	National Water Act
PER/PELJ	Potchefstroom Electronic Law Journal
REIPPPP	Renewable Energy Independent Power Producers Procurement Programme
S	Section
SS	Sections
SA Public Law	Southern African Public Law
SAJELP	South African Journal on Environmental Law & Policy
SAJHR	South African Journal of Human Rights
SALJ	South African Law Journal
SAPP	Southern African Power Pool
SDF	Spatial Development Framework
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UN GA	United Nations General Assembly
WEC	World Energy Council

Table of Contents

DECLARATION ..... **ii**
Abstract ..... **iii**
Acknowledgements ..... **iv**
Publications and conferences papers ..... **v**
Abbreviations and Acronyms ..... **vi**
Table of Contents ..... **vii**

Chapter 1 Towards Renewable Energy in South Africa **2**
1. Towards renewable energy in South Africa 3
Introduction 3
1.2. Background to the research problem 5
1.3. Articulating the research problem 9
1.4. Purpose and significance of the study 13
1.5. Hypothesis and research questions 18
1.6. Delimitation of the study 20
1.7. Conceptual overview, definitions and technical terms 23
1.7.1. Renewable energy, alternative energy and energy law 24
1.7.2. Environmental law and policy 26
1.7.3. Sustainable development, sustainability, and sustainable energy .. 27
1.7.4. The concept of regulation 31
1.7.5. Feed-in-Tariffs 35
1.7.6. Renewable Energy IPP programme (REIPPPP) 35
1.8. Major premises underlying the study 36
1.9. On the methodology 37
1.10. Synopsis of chapters 40

Chapter 2 The Imperatives for Regulating Energy **42**
2. Introduction 43
2.1. The analytical context of the study 44
2.1.1. The energy-environment interface 51
2.1.2. The international landscape for energy industry regulation 63
2.1.3. Sources of energy in South Africa and domestic challenges 68
2.2. Why regulate the renewable energy sector in South Africa? 72
2.2.1. Justification and imperatives in existing laws 74
2.3. Role of regulation in energy markets 93
2.4. Conclusion 95

Chapter 3 Barriers to Renewable Energy in South Africa **98**
3. Introduction 99
3.1. Economic obstacles to renewable electricity 104

3.2. Social and behavioural barriers 116
3.3. The ethical challenge 120
3.4. Institutional fragmentation and political conservatism 124
3.5. Legal and policy inertia: *The double-edged swords* 132
3.6. Conclusion 139

Chapter 4 Regulatory Framework for Energy 142
4. Introduction 143
4.1. Regulation of the energy industry in South Africa 144
4.1.1. Regulating primary sources of energy 145
4.1.2. Regulation under the Minerals and Petroleum legislation 147
4.2. The energy policy environment 156
4.2.1. White Paper on Energy Policy for South Africa of 1998 157
4.2.2. White Paper on Renewable Energy Policy of South Africa 2003 . 160
4.2.3. Climate Change Response White Paper 2011 167
4.2.4. A note on the National Development Plan 173
4.2.5. On free alternative energy and efficiency 174
4.3. Electricity legal framework 175
4.3.1. National Energy Act 177
4.3.2. The Electricity Regulation Act 179
4.3.3. The New Generation Capacity Regulations 2009/2011. 186
4.3.4. Managing the distribution of electricity 191
4.4. Existing framework for integrated energy planning 193
4.5. Conclusion 195

Chapter 5 Environmental Law: Enabler of Renewable Energy 198
5. Introduction: Environmental law as a catalyst 199
5.1. The crucial role of the constitution 200
5.2. The NEMA and renewable energy 207
5.3. Promoting renewables through EIA and land use planning 215
5.4. Water, nature conservation and energy 219
5.5. Promoting renewable energy through air quality legislation 225
5.6. Implications of environmental law for renewable energy 232
5.6.1. Conclusion: *Regulating for a transition to renewable energy* 233

Chapter 6 Regulatory Tools to Promote Renewable Energy 236
6. Introduction 237
6.1. Potential legal tools to promote renewable energy 241
6.1.1. Legal certainty and regulatory reorientation 243
6.1.2. Constitutional and institutional responses 246

6.1.3. Integrated energy resources planning 251
6.2. Towards an energy market and economic incentives 254
6.2.1. Subsidies and direct state funding in the energy market..... 258
6.2.2. Procuring energy from Independent Power Producers (IPPs) 265
6.3. Indirect drivers for renewable electricity..... 269
6.3.1. Environmental fiscal and tools to promote renewable energy 270
6.3.2. Climate change as a launch pad for renewables..... 274
6.3.3. Managing demand through energy efficiency..... 279
6.4. Lessons unlearnt – from REIPPPP to nuclear resurgence. 282
6.5. Conclusion 287

Chapter 7 The Future of Renewable Energy in South Africa 289
7. Introduction..... 290
7.1. Summary of insights 291
7.2. The social, economic, and cultural context of recommendations..... 294
7.3. Reinventing the role of law in energy regulation 295
7.4. Recommendations: *A comprehensive renewable energy framework* 302
7.5. Conclusion 310

8. BIBLIOGRAPHY 311
8.1. BOOKS, MONOGRAPHS & BOOK CHAPTERS..... 311
8.2. JOURNAL ARTICLES 323
8.3. GOVERNMENT PUBLICATIONS..... 343
8.4. TREATIES, REPORTS AND THESIS 347
8.5. INTERNET & OTHER MEDIA ARTICLES 354

9. TABLE OF CASES..... 361
10. TABLE OF STATUTES AND REGULATIONS 363

FIGURES

Figure 1: Global Energy Demand 1993-2020…....……71

Figure 2: Barriers, adapted from Müller et al 'Renewable Energy: Policy Considerations for Deploying Renewables' (OECD/IEA, 2011)……..104

Figure 3: Electricity Value Chains, adapted from a Department of Energy Report, South Africa, 2007……..……....150

Figure 4: World Energy Trilemma: Time to get real – the case for sustainable energy policy, World Energy Council (2012)……..286

Chapter 1
Towards Renewable Energy in South Africa

1. Towards renewable energy in South Africa

Introduction

While energy is indispensable for economic growth, this growth could be hampered by the lack of effective, facilitative laws to promote sustainable renewable energy.[1] South Africa remains one of the largest per capita greenhouse gas (GHG) emitters in the world, mostly from energy generation.[2] Attempts at reforming the energy regulatory framework have proceeded lackadaisically, since the drafting of a White Paper on Renewable Energy in 2003 (Renewables White Paper)[3] and amendments to the Electricity Regulation Act 4 of 2006 (ERA). No specific renewable energy legislation has materialised and this has *partly* obstructed efforts to move from unsustainable sources of energy to renewable sources. Thus, researches on what law and policy reforms are necessary to enable renewable energy are timely.

Compounding this slow movement, the country persists with the expansion of fossil fuel power plants under Eskom's Build Programme.[4] Nuclear energy is now being pursued with more rigour, featuring in the country's energy plans, the Integrated Resource Plan for Electricity (IRP 2),[5] the Nuclear Energy

---

[1] This research focuses on 'renewable energy' which in this study carries a *narrower* meaning of *renewables in the electricity sector*, excluding technologies in the liquid fuels, transport sectors as more fully set out in the delimitation of study section.

[2] Department of National Treasury 'Reducing Greenhouse Gas Emissions: The Carbon Tax Option' Discussion Document for Public Comment (December 2010) 'South Africa's Eskom has been ranked as the second-largest power producer in the world – in terms of carbon dioxide (CO2) emissions. And South Africa is placed eighth overall in a new ranking of countries by CO2 emissions.' 'SA Rises in the Ranks – of Polluters' (15 November 2007). <http://it-online.co.za/content/view/175330/142>; see also J Eilperin 'World's Power Plant Emissions detailed'<http://www.washingtonpost.com/wpdyn/content/article/2007/11/14/AR2007111402010.html>

[3] White Paper on the Renewable Energy Policy of the Republic of South Africa, November 2003 published as GN 513 in GG 26169 of 14 May 2004.

[4] More information on this Eskom expansion programme available at < http://www.eskom.co.za/Whatweredoing/NewBuild/Pages/New_Build_Programme.aspx >

[5] Electricity Regulations on the Integrated Resource Plan for Electricity 2010–2030 GN R 400 in GG 34263 of 6 May 2011 (November 2013 update) (IRP 2) 3-4, analysed in detail in Chapter 6. The IRP is the energy resource-planning tool used to forecast and project electricity supply, demand and resource projection in South Africa. Once approved it guides the further development of generation capacity and choice over sources.

Policy[6] and recent announcements of a nuclear procurement programme.[7] In total not less than three new coal-fired power plants are planned, and little effort is made to move away from fossil sources of energy as it is argued that there is no legal obligation to do so. Going nuclear is counter intuitive and against global trends, apart from concerns with financial cost to the country. [8]

Despite, the preparedness of investors and the private sector to promote renewable energy, the government has been slow to develop an appropriate specific legal framework to facilitate the development of these sources of energy.[9] Concomitant with an investigation of the need and desirability of a renewable energy law, this study analyses the role such a law could play in promoting such energy sources. It is submitted that the role that law generally can play to foster sustainable energy, depends on how suitable the law is to the task as well as political will to enforcement and implement the law. The thesis explores the barriers to renewable energy and how existing energy and environmental laws could be used to address the barriers and promote renewable energy. This includes, among many other approaches, by ensuring the alignment of energy laws to other laws that impede the transition to renewable energy as explored in Chapter 4 and 5. Broader governance issues and poor implementation of brilliant policies and laws add to the challenges, but detailed analysis of those issues is not the purpose of this study.

---

[6] Department of Minerals and Energy *Nuclear Energy Policy for the Republic of South Africa* GN 1347 of 2008 in GG 31695 of 12 December 2008 <http://www.energy.gov.za/files/policies/policy_nuclear_energy_2008.pdf >

[7] Energy on Nuclear Procurement Process Update <http://www.gov.za/speeches/nuclear-procurement-process-update-14-jul-2015-0000>

[8] F Farouk 'The Green Economy and Sustainable Development in Sub-Saharan Africa' in N Netzer & J Althaus (eds) *Green Economy Turning Over a New Leaf Towards Sustainable Development?* (2012) 17, 19. The Eskom generation capacity expansion programme is valued at R200-billion, and work has already started at the first coal-fired plant constructed in more than two decades, the Medupi base load plant in Lephalale, Limpopo. Demand estimates and the cost of nuclear to 2030 have been revised under the Integrated Resource Plan for Electricity 2010–2030 (November 2013 update) 3-4.

[9] It is argued in this study that the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) is not sufficient as a legal framework to promote renewable electricity. The programme is essentially a project to supplement the supply gap left by Eskom's lack of capacity. See infra Chapter 6.

Environmental law provides the justifications for renewable energy, in addition to economic and aesthetic imperatives beyond law.[10] The current legal and governance frameworks developed in a political and economic environment dominated by fossil fuels and are providing inadequate as instruments to promote renewable energy. This is not only limited to energy and environmental laws but pervades the whole legal edifice including laws of property, land use planning, agriculture and natural resources governance laws. However, the great transition to renewable energy requires more than just legal reforms going to the core of how we live and our energy choices and attitudes towards natural resources.

The energy intensive economy has served South Africa very well that it is hard to imagine a future industry that any less energy intensive. The culture of cheapo energy and perceptions of abundance of fossil fuels in particular coal fostered a culture of energy inefficiency. In a small way the integration of energy and environmental regulation can assist in reducing the impact of other non-legal barriers to renewable energy and thereby act as the trigger for a shift towards an energy mix where renewables have a substantial share than is currently the case.[11] Integration is only one step towards creating an enabling environment for renewable energy. The legal system itself and instruments of governance have to be transformed through a green economy revolution.

1.2. Background to the research problem

In 2003, the then Department of Minerals and Energy produced the Renewables White Paper, which laid out the country's policy and strategy for promoting renewable energy technologies. Among other things, the Renewables White Paper acknowledged that dependence on 'fossil fuels does not go without a price,'[12] and the environmental impacts are huge, as evidenced by the global problem of climate change. The Renewables White Paper also

[10] See Chapter 4 for further analysis of how environmental law builds the case for renewables.
[11] While this was more the case when this study commenced in 2009, a measure of integrated regulation has been achieved going into 2015.
[12] Renewables White Paper (note 3 above) i.

acknowledged that 'while South Africa is well endowed with renewable energy resources that can be sustainable alternatives to fossil fuels, so far these... remained largely untapped.'[13] The specific obstacles to renewable energy use identified include the fact that:

> [m]any renewable energy technologies remain expensive, on account of higher capital costs, compared to conventional energy supplies for bulk energy supply to urban areas or major industries; [i]mplementation of renewable energy technologies needs significant initial investment and may need support for relatively long periods before reaching profitability; [t]here is a lack of consumer awareness on benefits and opportunities of renewable energy; [t]he economic and social system of energy services is based on centralised development around conventional sources of energy, specifically electricity generation, gas supplies and, to some extent, liquid fuel provision;...[t]here is a lack of non-discriminatory open access to key energy infrastructure such as the national electricity grid, certain liquid fuels and gas infrastructure; [m]arket power of utilities.[14]

These untapped energy sources include solar, wind, hydro, biomass (including biofuels), natural gas, and waste-to-energy technologies.[15] These primary renewable energy sources are either directly deployed or used to produce electricity through various energy conversion processes. Thus, solar energy can be used directly for water heating and cooking while it can also be used as photovoltaic cells (PV) or concentrated solar power (CSP) for electricity. The technology regarding each of these sources is at different stages of commercial development and this aspect is explored in detail in the thesis.[16]

In addition, the government acknowledged that there are a number of barriers to the integration of renewable energy technologies into the mainstream energy supply sector[17] of South Africa. Chief among these barriers was, and

---

[13] Ibid vii. see W du Plessis 'Energy Law' in Kurt Deketelaere et al *South Africa: International Encyclopaedia of Law* (2015) 121-121.
[14] Ibid 9.
[15] I briefly explain the technological status of each of these below, but note that this is not the focus of this thesis, which is essentially concerned with law and policy study.
[16] See section 1.2.2 below.
[17] RT Watson, MC Zinyowera & RH Moss *Technologies, Policies and Measures for Mitigating Climate Change* (1996) 37. ('The energy supply sector consists of a sequence of elaborate and complex processes for extracting energy resources, converting these into more desirable and suitable forms of energy, and delivering energy to places where the demand exists').

remains, the absence of an enabling legal environment. In this regard, the Renewables White Paper states that:

> if the use of renewable energy is to be successfully, implemented Government should create an *enabling environment* through the introduction of fiscal and financial support mechanisms within *an appropriate legal and regulatory framework,* to allow renewable energy technologies to compete with fossil-based technologies.[18]

These and other barriers are fully analysed in Chapter 3 in this thesis, but the absence of an enabling legal framework is the central concern of this thesis. In line with the aspirations in the Renewables White Paper, the government set itself renewable energy targets to be achieved by 2013, which target has been missed already.[19] It is imperative therefore that we assess, among other things, why the policy aims set out in the Renewables White Paper have not been fully met. This is particularly relevant given the turnabout that the South African government recently made in 2014 to focus more on the further development of fossil-based and nuclear energy ahead of renewable energy technologies.[20]

In order to achieve sustainable development (and energy sustainability), it is necessary to move towards renewable and sustainable energy[21] coupled

---

[18] Ibid 5 and 27 *(my emphasis).*

[19] According to the Renewables White Paper (note 3 above) 25 the targets set were as follows: '10,000 GWh (0.8 Mtoe) renewable energy contribution to final energy consumption by 2013, to be produced mainly from biomass, wind, solar, and small-scale hydro. The renewable energy is to be utilised for power generation and non-electric technologies such as solar water heating and bio-fuels. This is approximately 4% (1,667 MW) of the estimated electricity demand (41,539 MW) by 2013. This is equivalent to replacing two (2 x 660 MW) units of Eskom's combined coal-fired power stations.' The revised target in the Integrated Resource Plan 2 (IRP 2) (2013 update) is 9% contribution by renewables to South Africa's electricity supply by 2030.

[20] IRP 2 (November 2013 update); 'Green Groups Challenge Eskom Plans' *LegalBrief Environmental* 0134 (20 October 2009) 1; Baseload IPP Procurement Programme 2012, GN 1075 in GG 36005 of 19 December 2012 and the Request for Proposals issued in December 2014.

[21] IS Russell 'The Sustainability Principle in Sustainable Energy' (2008) 44 *Tulsa LR* 121; J Goldemberg 'Development and energy' in AJ Bradbrook & RL Ottinger *The Law of Energy for Sustainable Development* (2005) 37; 'Renewable energy' is defined in s 1 of the National Energy Act 34 of 2008 as 'energy generated from natural non-depleting resources including solar energy, wind energy, biomass energy, biological waste energy, hydro energy, geothermal energy and ocean and tidal energy.'

with improved energy efficiency.[22] Research indicates that the most threatening global environmental problem currently is climate change caused by the release of greenhouse gases (GHGs) into the atmosphere.[23] The single largest source of the GHGs is the energy industry, particularly electricity generation.[24] While South Africa is suitably positioned, among Southern African countries to lead in the transition to sustainable energy, it has not done enough in terms of using energy and environmental regulation to steer the energy industry towards sustainability particularly using renewable sources.[25] Rather, South Africa remains the biggest per capita emitter in Africa with 40% and ranked 12th globally,[26] while unsustainable mining, iron, and steel multinational corporations that sometimes ship their profits to foreign shareholders consume most of this cheap electricity under uneconomic contracts.[27]

---

[22] FP Bosselman, J Rossi & JL Weaver *Energy, Economics, and the Environment: Cases and Materials* (2000) 21; UN Energy for Sustainable Development, Report of CSD 14 (2006). Contrary to this, the South African government is reinvigorating its drive towards a nuclear dispensation and augmenting its coal and gas-based power generation.

[23] The scientific link between climate change and GHGs is still to an extent contested, see *Commonwealth of Massachusetts v Alliance of Automobile Manufacturers 367* US App D.C 282; 415 F.3d 50 (2005); on appeal *Massachusetts v Environmental Protection Agency* 127 S. Ct. 1438; 167 L. Ed. 2d 248; 2007 US LEXIS 3785; N Stern *The Stern Review: The Economics of Climate Change* (2006) 7-8.

[24] IPCC 5th Assessment Report, Working Group I (2014); Energy includes power generation, transport systems, buildings, industrial processes and other energy related life processes-global energy consumption (Power 24%, Transport 14%, Industry 14%, Buildings 8%, other energy 5%).

[25] The White Paper has largely remained a white paper while efforts are now under way to construct more coal and nuclear fired power plants to meet the increasing demand for electricity; highlight the shortcomings of the Electricity Act, Energy Regulator Act and Nuclear Energy Act. What accounts for this energy policy shift from 2003 to 2008? South Africa is better positioned given its capacity in terms of financing such programmes, and developing new technologies.

[26] UNDP 'Human Development Report (HDR) 2010: Fighting Climate Change – Human Solidarity in a Divided World' (2007/2008); T Letete, M Guma & A Marquard 'Information on Climate Change in South Africa: Greenhouse Gas Emissions and Mitigation Options' Energy Research Centre (2009) <http://www.erc.uct.ac.za/Information/Climate%20change/Climate_change_info-complete.pdf >.

[27] See generally D Hallowes 'The World Bank and Eskom: Banking on Climate Destruction!' (2009) *Groundwork*; Banktrack 'Dodgy Deal: Medupi Coal Power Plant South Africa' (22 April 2014); see also *BHP Billiton PLC Inc & another v De Lange & others* 2013 (3) SA 571 (SCA); [2013] 2 All SA 523 (SCA) (concerning the refusal by Eskom and BHP to disclose the terms of one such deal).

1.3. Articulating the research problem

The heavy reliance on conventional fossil fuels to generate electricity is unsustainable and poses serious threats to the environment. Global climate change caused by GHG emissions shows that the energy industry contributes over 90% of these emissions. Despite South Africa's energy intensiveness and heavy reliance on coal, energy and environmental laws do not sufficiently facilitate transition towards sustainable renewable sources.

Existing energy laws were formulated to facilitate a conventional energy industry and the laws have entrenched fossil fuels as the most viable source of energy. The problems in the current situation are the laws that are not sufficiently promote renewable energy. The effects of reliance on fossil fuels are not the problem, but only a symptom of this bigger challenge. The background above shows that the lack of an appropriate legal framework for renewable energy is hampering efforts to develop and deploy sustainable and affordable renewable energy sources in South Africa.[28] It must be emphasised that this is only one of many other challenges standing in the way of renewable energy technologies.[29]

The lack of an appropriate legal framework is an overriding obstacle and has implications on whether and how the repercussions of the other obstacles, especially economic and institutional, can be mitigated or eliminated.[30] The obstacles are dissected in Chapter 3 and possible strategies to respond to them explored in Chapter 6 and 7.

---

[28] Other obstacles in this context may connote issues such as lack of political will, powerful lobbying by established energy industries or lack of awareness; see also 'Achieving the G-20 call to Phase out Subsidies to Fossil Fuels' *Global Subsidies Initiative Policy Brief* (October 2009) (75% of subsidies to the energy sector in the G-20 and developing countries are towards fossil fuels and electricity).

[29] R Lyster & AJ Bradbrook *Energy Law and the Environment* (2006)

[30] This hypothesis is supported by observations by various energy law scholars on the significance of the legal framework among many factors militating against renewable energy. (See for instance BK Sovacool 'The Importance of Comprehensiveness in Renewable Electricity and Energy Efficiency Policy' (2009) 37 *Energy Policy* 1529, 1531; D Leary & M Esteban 'Climate Change and Renewable Energy from the Ocean and Tides: Calming the Sea of Regulatory Uncertainty' (2009) 24 *The Int J of Marine and Coastal Law* 617, 619.

Technology forcing through legal regulation may be required if public utilities are to make that transition and if the private sector is to invest in the development of renewable energy.[31] Although South Africa is implementing sustainable development generally,[32] it has not yet taken concrete steps to create a supportive legal framework for renewable energy. Admittedly, many social, economic, and historical factors prevent a drastic or wholesale transition towards renewable energy. This is especially so in the South African socio-economic context where poverty is an overriding issue (including energy poverty), and the country has a constitutional obligation to promote social and economic rights.[33] The development of an effective legal framework to guide the gradual transition to renewable energy is a potential solution to support sustainable development and promote socio-economic and environmental rights.

South African energy and environmental law have, for the large part, remained focused on preserving the status quo of the electricity sector. There has been no sustained legal research conducted on the potential of existing energy and environmental laws to promote a gradual transition to an energy mix where renewable energy features in noticeable proportion to fossil fuels.[34] For example, this has been done in countries such as the European Union,[35] and Germany[36] for example. Broadly, research in energy law in South Africa has mainly focused on technological developments, policy, poverty alleviation and

---

[31] J Goldemberg & TB Johansson (eds) *World Energy Assessment Overview: 2004 Update* (2004) <http://www.undp.org/energy/weaover2004.htm> 71 (identifying technology forcing as one of the policy options to address barriers to renewable energy).

[32] It is reported that South Africa leads in the growth of solar PV deployment in Southern Africa: IRENA (2015), Africa 2030: Roadmap for a Renewable Energy Future. IRENA, Abu Dhabi, 14 < http://www.irena.org/DocumentDownloads/Publications/IRENA_Africa_2030_REmap_2015_low-res.pdf >

[33] See s 7 (2) of the Constitution of the Republic of South Africa 1996.

[34] This issue is the central theme and expounded in Chapter 4.

[35] See generally M Muñoz, V Oschmann & JD Tàbara 'Harmonization of Renewable Electricity Feed-in Laws in the European Union' (2007) 35 *Energy Policy* 3104.

[36] M Nast, O Langniβa & U Leprich 'Instruments to Promote Renewable Energy in the German Heat Market - Renewable Heat Sources Act' (2007) 32 *Renewable Energy* 1127.

the electricity crisis[37] and climate change adaptation. While very valuable, these, often technical, economics and scientific studies have neglected to highlight the role of law in regulating *for* renewable energy, a gap that this study seeks to fill.

Therefore, there is need for legal research at a deeper level into the utility of the recent disciplines of renewable energy and environmental law towards achieving sustainable energy by focusing on the development of an effective renewable energy legal regulatory framework.[38]

The Renewables White Paper states that faster deployment of renewable energy technologies has been hampered further by lack of investment and funding.[39] Financing and investment in energy depends on the legal environment to incentivise and provide certainty and guarantees to investors.[40] For instance, despite some preparedness by investors and the private energy industry to promote biofuels, the government has moved slowly in developing an appropriate framework to facilitate the development of this type of renewable energy. Investors desire to have guarantees of returns on their investments.

---

[37] Despite being in denial, some Cabinet Ministers are clear that we have an electricity crisis see Q Hunter 'At the Heart of Eskom's Darkness' *Mail & Guardian* (16 January 2015) (citing one Minister conceding that, 'There has to be Self-criticism in the ANC government. We made unwise decisions and locked ourselves in bad contracts [on electricity]. When technical people advised us about the problems we are facing today, government ignored it').

[38] I use energy law and environmental law together because the distinction between the two is somewhat artificial in the context of the drive towards sustainable development or sustainability, which emphasises integration. Energy law concerns the regulation of the various energy resources, whilst environmental law concerns the same natural resources in a broader sustainable development sense. For instance, in order to construct a dam for the purposed of building a hydro power plant the proponent must at the same time comply with energy regulations as well as regulations made under environmental statutes like the National Water Act 36 of 1998; to transmit the generated electricity the proponent must carry out environmental impact assessments which are carried out in terms of environmental regulations. A coal based/thermal power plant must meet the air quality standards laid out in terms of the National Environmental Management: Air Quality Act 39 of 2004 (Air Quality Act). The two cannot therefore be strictly separated especially when it comes to renewable energy which seeks to use renewable natural resources like wind, water, plant waste or biomass, among others, to generate electricity. This issue is explored in depth in Chapter 3.

[39] Renewables White Paper (note 3 above) 9.

[40] P Lowe 'Regulating Renewable Energy in the European Union' (2010) 1 *Renewable Energy Law and Policy Rev* 17, 17-18 (the establishment of legally binding obligations to achieve renewable energy creates an incentive for member states to put in place policy frameworks); generally, P Curnow, L Tait & I Millar 'Financing Renewable Energy Projects in Asia: Barriers and Solutions' (2010) 1 *Renewable Energy Law and Policy Rev* 101.

A particular concern is the weak focus on promoting renewable energy in existing body of laws ranging from property laws, land use planning laws, and more apposite for this study in the environmental and energy laws. The latter includes framework environmental legislation such as the National Environmental Management Act 107 of 1998 (the NEMA) and the regulatory framework for energy production and consumption. As far and existing environmental and energy laws are concerned misalignment between these fields of law and policy has a particularly negative impact on the utility of law in fostering pathways towards sustainable renewable energy.[41] However, merely aligning energy and environmental laws will not per se see renewable energy breaking through into the South African energy mix.

While environmental law aims to promote sustainable development through integrated planning and land-use planning, pollution prevention, biodiversity conservation and sustainable use of natural resources,[42] these principles may be seen as obstacles to the use of natural resources in energy production through, for example, hydropower and coal. It is interesting to note how key principles of environmental law can and should inform the development of energy policy and regulation, but they have played an insignificant role in the development of the South African energy policy generally and very minimally so far on renewable energy.

Regulatory inconsistencies exist in relation to other areas of the law such as property, agriculture,[43] land-use planning and zoning, and environmental impact assessment (EIA). I fully discuss this complex interface and regulatory inconsistencies in Chapters 4 and 5, suffice to state here by way of background that it is one of the many barriers to renewable energy; and one which this study

---

[41] Johansson (note 31 above) 49; AJ Wildermuth 'Is Environmental Law a Barrier to Emerging Alternative Energy Sources?' (2010) 46 *Idaho LR* 509, 511 and 543 ('Currently environmental law does not appear to pose a barrier to emerging alternative energy development. But it does not help.'), LL Davies 'Alternative Energy and the Energy-environment Disconnect' (2010) 46 *Idaho LR* 473, 490. ('To the extent that alternative energy is seen as promoting environmental objectives – less pollution, more conservation – the fact that energy law and environmental law promote different goals clearly has restrained the adoption of more renewables.')

[42] Objectives drawn from s 24 of the Constitution of the Republic of South Africa 1996, (right to an environment not harmful to health or well-being).

[43] RL Ottinger & SE Miller 'Bioenergy in Developing Countries: Potential and Risks' (2010) 1 *Renewable Energy Law & Policy Review* 23, 25–6 (food *versus* fuel).

engages with in detail to the exclusion of other non-legal barriers. A legal regulatory framework would bring certainty and clarity on the other barriers including addressing concerns with some of the new renewable energy technologies.[44] This focus on the legal uncertainties and consequent slow progress towards renewable energy, does not mean that other barriers discussed in Chapter 3 are irrelevant. Rather, this being a juridical study, it seeks to make a contribution in terms of how the 'legal' barriers, as exemplified by the misalignment and fragmentation between energy, environmental and mining laws- are a major obstacle to the transition to an energy mix where renewables play a bigger role.

1.4. Purpose and significance of the study

The purpose of this thesis is to investigate the potential role of law and regulation in promoting the increased use of renewable energy in South Africa. Existing energy and environmental laws legitimate and entrench conventional fossil sources of energy. The entrenchment of fossil fuels creates a regulatory environment that does not adequately promote renewable sources. Among other problems, the internal and external fragmentation between, and within, energy, and environmental law are one of the legal impediments to the use of renewable energy in South Africa. This, however, is not the only factor preventing renewables from becoming a big part of the energy mix. However, addressing this problem has an unlocking, *though not eliminative*, effect on other obstacles to renewable energy. Regulatory integration can play a role in transforming law and regulation broadly to enable renewable energy technologies, but it is not the exclusive solution. Economic market interventions, changing societal attitudes to enable informed energy choices, and political will are required to address most of the non-legal obstacles to renewable energy and make any legal reforms effective in practice.

[44] RL Ottinger 'Biofuels: Potential, Problems and Solutions' (2009) 19 *Fordham Env LR* 253.

Existing studies have focused on the technological merits of renewable energy sources and instruments to promote them from an economic perspective. There is scant legal research into how existing laws obstruct or enable the use of renewables. This entails determining in the first place whether increasing the use of renewable energy *requires legal regulation,* and secondly *how much* of that legal regulation is necessary, and *what form* it could take? At the outset, the purpose of this study is not to advocate for a complete supplanting of the current energy system with renewables. Rather the transition envisaged is a progressive increase of the share of renewables in South Africa's energy mix. This approach recognises the energy intensive nature of South Africa's economy and the socio-economic context that suggests a wholesale transition to be unsustainable and imprudent.

The goal of the study is to analyse the implications of the absence of an enabling legal framework, as illustrated by the regulatory fragmentation between energy and environmental law for renewable energy use. This is done in the context of other obstacles to renewable energy; the aim being to propose legal reforms that can promote renewable energy use in South Africa. Thus, in pursuit of this goal, the thesis is designed to engage in the following tasks:

- Evaluate broadly the barriers to renewable energy uptake and discuss what regulatory responses could be developed to address these barriers focusing mainly on legal obstacles. This review of barriers provides context to the limited focus on legal focus that concerns the rest of this study.
- Analyse the current energy and environmental laws and policies that relate to energy generation, distribution, and consumption in South Africa. The study is confined to relevant environmental laws that implicate how energy is produced and consumed.
- Analyse the imperatives for using legal regulation to enable the transition to an energy mix that substantially includes renewable energy.
- Assess the extent to which South Africa's existing energy regulation and laws are framed to either achieve or obstruct the transition to sustainable

renewable energy. Search for sustainable legal pathways to an energy mix where renewables contribute a substantial share.

The significance of this study is that it makes insights into an area hitherto not thoroughly researched in South African law. It is largely the government that has taken steps to do research and development into the law on renewable energy.[45] However, undeniably, a number of the studies focus purely on the scientific, engineering, technical, economic and feasibility issues relating to renewable energy.[46] These studies have generally eschewed sustained analysis of the law relating to renewable energy and its implications on the adoption and use of renewable energy technologies. In particular, the private sector has largely taken limited interest in energy regulation, even though they are the biggest consumers of energy services.

Research and development, whether in science or engineering, all take place in a legal context and often according to set legal procedures that must guide such research. It is mundane that law and regulation play a significant role not only in setting the parameters of scientific research but more importantly, on how the results of such research could be tried, tested, and commercialised. As noted above, it is imperative that the shifts in government energy regulation be investigated with a focus on the effects on the adoption of renewable energy technologies.

This study thus highlights the significance of the role that renewable energy law and policy *can* and *should* play in the context of energy law and

---

[45] This is not to downplay the role of other energy research institutions that have contributed technologically towards renewable energy. However, they have not done much in terms of legal advocacy.

[46] See for instance M Edkins, H Winkler & A Marquard 'Large-scale Rollout of Concentrating Solar Power in South Africa' (August 2009) <http://www.erc.uct.ac.za/Research/publications/09Edkins-etal-Rollout_of_CSP.pdf>; B Bekker *et al* 'South Africa's Rapid Electrification Programme: Policy, Institutional, Planning, Financing and Technical Innovations' (2008) 36 *Energy Policy* 3115; M Haw & H Hughes 'Clean Energy and Development for South Africa: Background Data' (28 February 2007) <http://www.erc.uct.ac.za/Research/Publications-recent.htm>; H Winkler 'Energy Policies for Sustainable Development in South Africa' (2007); G Prasad & E Visagie 'Renewable Energy Technologies for Poverty Alleviation Initial Assessment Report: South Africa' (2005) <http://www.erc.uct.ac.za/Research/publications/05Prasad-Visage-RET.pdf>.

regulation to achieve sustainable development. It has correctly been stated by the World Energy Assessment that:

> energy solutions require joint efforts involving government agencies and policy makers, the private sector and industry, civil society and collaboration within the international development community, including the United Nations system. The challenges of sustainable development are great and the importance of energy in achieving sustainable development goals cannot be overstated. *Significant changes in national, regional and global energy systems will be required to meet these challenges*.'[47]

It is submitted that the changes in 'energy systems' include *legal and regulatory norms* underpinning the energy systems.

It is in this international recognition of the need to move toward sustainable energy systems that one perceives the indispensable need to develop proper and facilitative legal frameworks nationally and transnationally. However, while developing an appropriate national legal framework is necessary, other considerations must be kept in mind. For instance, Strydom and King rightly argue that, 'the ultimate test, however, is the *suitability* of the transformed regulatory framework for achieving *the right balance between* the need for economic development, environmental sustainability, and energy security.'[48] This balance is indeed the major focus of sustainable development and sustainable energy.

The most pressing global environmental problem now is climate change and its sequel in the form of changing weather patterns, droughts, extreme weather events, diseases, and other climate variability hitherto not experienced by human nature. It is admitted that the main contributor to the emissions of GHGs, which are the cause of climate change, is the energy industry as a whole ranging from electricity, liquid fuels, and transportation.[49] It is precisely for this reason that it is urgent to look for solutions to alleviate the emissions of

---

[47] J Goldemberg & TB Johansson (eds) *World Energy Assessment Overview: 2004 Update* (2004) 5, 68 <http://www.undp.org/energy/weaover2004.htm> 5 *(my emphasis)*.

[48] HA Strydom & AD Surridge 'Energy' in H Strydom & N King *Environmental Management in South Africa* 2nd ed (2009) 808 *(my emphasis)*.

[49] O Edenhofer 'The IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation' (2011) < http://srren.ipcc-wg3.de/report >. TF Stocker *et al* (eds), IPCC 2013: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate* (2013) 465.

GHGs from the energy industry. A study of this nature cannot look at the energy industry in its totality given its breadth, hence the narrow focus on renewable energy particularly in the electricity sector.

The significance of the study in this substantive dimension is unequivocal yet the study is set to make better insights unpacking the role of law in promoting renewable energy. Law is thus an indispensable piece in the puzzle of promoting the transition to renewable energy. David Elliott concludes by stating that

> '[p]olitical intervention, and the establishment and operation of an *appropriate regulatory framework*, seems to be *necessary* to create the economic conditions for the rapid uptake of the new technologies and development of the *necessary institutional and social infrastructure of support and acceptance*.'[50]

The support that law could render in promoting renewable energy ranges from being purely regulatory, to forcing technology, to stimulating a change of social and economic attitudes[51] and to, essentially, ensure the weaning of economies from fossil-based conventional energy sources gradually.

Undoubtedly, we see in this context that a study of this nature was long overdue especially in the developing country context, where environmental and now renewable energy and climate change issues are often seen as insignificant in the midst of poverty and want. An understanding of the role of law and regulation could enable governments to design appropriate legal frameworks and instruments to promote renewable energy while promoting justifiable social and economic development.[52]

In a sense, the study also contributes to a better understanding of the relationship between natural resources law, environmental pollution and energy production, which could lead to better regulation of these areas and sectors. As Thomas Johansson rightly notes,

> Energy use contributes to indoor and urban air pollution, acidification, and global warming. It is responsible for eighty-six per cent of global anthropogenic

---

[50] D Elliott *Sustainable Energy: Opportunities and Limitations* (2010), 275 *(my emphasis).*
[51] W Abrahamse & J de Groot 'The Psychology of Behaviour Change: An Overview of Theoretical and Practical Contributions' in S Fudge *et al The Global Challenge of Encouraging Sustainable Living: Opportunities, Barriers, Policy and Practice* (2013) 3.
[52] An approach advocated by s 24 of the Constitution of South Africa 1996.

> emissions of sulphur dioxide, the main chemical responsible for environmental acidification that damages forests and lakes. As for global warming, the use of fossil fuels leads to major emissions of carbon dioxide and methane, the main greenhouse gases. Fossil fuel use contributes approximately seventy-eight per cent of anthropogenic emissions of carbon dioxide, and twenty-three per cent of emissions of methane, as well as significant fraction of emissions of long-lived small particulate matter, which poses significant risk to human health when inhaled.[53]

This functional intertwinement of energy and environmental law could be used to create a functionally integrated regulatory framework, not only to promote renewable energy, but also to promote the objectives of environmental and energy law.

1.5. Hypothesis and research questions

In the context of persistent energy insecurity, demand pressures, and climate change largely linked to energy production, among other problems; South Africa must increase the use of renewable energy in the electricity sector. Threats to energy security are highlighted by the now frequent power outages that have serious repercussions on the economy.[54] One way to increase the use of renewable energy is through regulatory intervention in the energy and environmental law spaces to create an enabling environment and incentives. Other interventions are required in the economic, political, and cultural spaces of energy use and energy choices aspects that are beyond the scope of this juridical inquiry.

The unfortunate reality is that the current legal framework, especially energy, environmental, mining and other cognate laws, taken together as a legal system; are not sufficiently designed towards facilitating the increased use of renewable sources. In some cases, the existing laws are in fact obstacles to the transition to an energy mix that substantially includes renewables. The

---

[53] TB Johansson 'The Imperatives of Energy for Sustainable Development' in AJ Bradbrook & RL Ottinger *The Law of Energy for Sustainable Development* (2005) 49.

[54] G van der Nest 'The economic consequences of load shedding in South Africa and the state of the electrical grid' TRALAC comment 11 February 2015. < http://www.tralac.org/discussions/article/7000-the-economic-consequences-of-load-shedding-in-south-africa-and-the-state-of-the-electrical-grid.html >

reasons of this status quo include the design of the laws, institutional and regulatory fragmentation, constitutional constraints, governance challenges in the implementation of laws and poor implementation of even the good laws, among other factors all explored further in Chapters 4 to 6.

The primary research question investigated by this study is therefore, to what extent does South African energy laws promote the development, use and deployment of renewable energy and how could these laws be reformed where they are deficient? This overarching question can be broken down into the following three secondary questions:

1. What are the obstacles/barriers to renewable energy in South Africa's electricity energy sector?
2. How significant, and to what extent, is the absence of a legal framework detrimental to promoting renewable energy in SA?
3. How does environmental law affect the conception, development, and deployment of renewable energy, if at all? Is there a causal relationship or simply a subject matter connection given the sources of energy?
4. What regulatory responses are necessary within energy environmental law to promote the gradual transition to an energy mix in which renewable energy play a bigger role?

It is expected that in searching for a legal framework for renewable energy, the thesis questions the dominant view that renewable energy technologies are too costly, and still underdeveloped to be deployed on a wide commercial scale. This outlook has largely led to the perpetuation of the current legal framework that is not favourable to renewable energy initiatives. Thus, the thesis seeks to understand the role that a supportive legal system can play in promoting renewable energy. While indeed renewable energy may be costly, developments in other jurisdictions are showing that appropriate laws and

regulations can create incentives for the transition to affordable renewable energy.[55]

Furthermore, while it may be argued that current energy sources, are cheaper in the short term,[56] they are a health and environmental hazard, a heavy drain on the fiscus in the long term. This is mainly through pollution, the distortion of energy markets, and heavy state subsidisation, which, if removed and the markets opened, could see renewable energy making a bankable business case. Guruswamy correctly concludes that:

> [a]part from the possibility that hydrocarbons are greenhouse gases that may cause anthropogenic global warming, the entire hydrocarbon energy cycle of production, mining, transportation, refinement, use, and emissions is fraught with daunting environmental and public health problems. The environmental and public health effects and impacts of acid rain, heavy metals, urban smog (created by the mining and burning of fossil fuels) can be very damaging to both developing and developed countries.[57]

This quote encapsulates the interconnections, contradictions, and regulatory inconsistencies between energy, renewable energy, environmental, and natural resources law within which the problem of unsustainable energy subsists. This study unpacks this complex network of related, but conflicted, regulatory contexts with a view to finding legal pathways to sustainable renewable energy, within the peculiar needs of South Africa and other developing countries.

1.6. Delimitation of the study

The research problem articulated above transcends a number of disciplines ranging from law and development, environmental law, human rights law,

---

[55] UNDP 'World Energy Assessment: Energy and the Challenge of Sustainability' (2000) 439 <http://www.undp.org/energy/activities/wea/drafts-frame.html>; see also R Lyster & AJ Bradbrook *Energy Law and the Environment* (2006) 28-29 *(my emphasis)*; J Goldemberg & TB Johansson (eds) *World Energy Assessment Overview: 2004 Update* (2004) 5, 68 <http://www.undp.org/energy/weaover2004.htm>.

[56] See note 25 above on the weaknesses of this argument. That the White Paper has largely remained a white paper while efforts are now under way to construct more coal and nuclear fired power plants highlights the shortcomings of the Electricity Regulation Act, Energy Regulator Act and Nuclear Energy Act.

[57] L Guruswamy 'The Law and Economics of Development and Environment: Sustainable Energy: A Preliminary Framework' (2005) 38 *Ind. LR* 671, 672-673.

energy law, economics, behavioural sciences, and regulation. The study remains a juridical exploration and peripheral issues will not be discussed in any detail. Environmental law, together with property, land use planning laws, in particular have a complex relationship with energy law and can either aid or obstruct the transition to renewable energy. In a narrow sense the role of law in development assists in the analysis of the role of law in promoting sustainable development[58] and in this regard sustainable renewable energy.

The human rights dimensions of the study concerns the relationship between energy poverty and the lack of development, and whether the forms of energy promoted in an economy have any bearing on progress in alleviating energy poverty.[59] Economics has often provided reasons for downplaying the role of renewable energy in sustaining development.[60] While not addressed in detail, this being a legal study, such arguments will be briefly analysed against arguments for the need for sustainable renewable energy. The economic framework for costing and pricing energy has cemented an economic advantage for fossil-based energy as demonstrated in Chapter 3 and 4 below.

Lastly, regulatory law provides the framework in which regulatory fields of law (in this case energy and environmental law) can set the scene for renewable energy regulation. In the scheme of this study, regulatory law refers to a crosscutting concept that transcends traditional fields of law – going beyond

---

[58] This concept is used as defined in the NEMA, s 24 of the Constitution 1996, and the Mineral and Petroleum Resources Development Act 28 of 2002; see also Lyster & Bradbrook (note 29 above) on the role of law in promoting renewable energy technologies.

[59] See generally AJ Bradbrook & JG Gardam 'Placing Access to Energy Services within a Human Rights Framework' 2006 (28) *Human Rights Quarterly* 389 *et seq*; SR Tully 'The Contribution of Human Rights to Universal Energy Access' (2006) *4 Nw Univ J Int Human Rights* 518. A transition to renewable energy if costly may mean that accessing energy becomes expensive and beyond the reach of many, while promoting community-based initiatives towards self-sustaining small renewable generation capacity could be cost effective compared to large-scale projects.

[60] Uncritical cost-benefit analyses show that it is cost effective to use coal to generate electrical energy in South Africa compared to costly renewable energy technologies. However, studies evaluating the actual total cost of fossil-based energy generation show that coal power generation is far more expensive than most renewable sources, see Russell (note 21 above) 142. This became clear when the externalities of fossil-based power generation were factored in e.g. health-care costs and loss of human capital.

'command and control' regulation.[61] Environmental law, administrative law, energy law, and some aspects of economic law are included under the rubric of regulatory law. Clearly, one understands that regulation itself has a peculiar relationship to law, as explored in section 1.7.4 on the conceptual frame of regulation.

To delimit the subject matter scope of this study, one has to understand the potentially limitless breadth of a research on the regulation of renewable energy. Ultimately, this study is about the role and function of law in promoting a transition to substantial use of renewable energy. It is not about the scientific, technical, and economic feasibility of the various renewable energy sources in South Africa – this being the epistemological domain of economics, energy engineering, and energy policy studies. This study is not a comparison of wind, solar, geothermal and nuclear energy – this has already been done extensively by energy engineers.[62] Nevertheless, the focus on legal regulation entails that the other barriers feature, here and there, to demonstrate how law can be useful to promote the renewable energy revolution.[63]

Lastly, the findings of this study may not be generalizable given the context-specific variables that have affected the deployment of renewable energy in different socio-economic and geographic settings. This is further compounded by the many non-legal factors that have also been proven to act against a transition to renewable energy. The latter, while limiting the impact of

---

[61] I conceive of regulatory law as any law whose objective is to promote some or all of the objectives of regulation discussed in Chapter 2 and which is mainly procedural along the spirit of Administrative Law. For detailed discussions of the 'command and control' theory or approach see J Black 'Critical Reflections on Regulation' (2002) 27 *Aust. J. Legal Philosophy* 1, 2-4 *et seq*; R Baldwin, M Cave & M Lodge *Understanding Regulation: Theory, Strategy, and Practice* (2011) 106 *et seq.*

[62] J Krupa & S Burch 'A New Energy Future for South Africa: The Political Ecology of South African Renewable Energy' (2011) 39 *Energy Policy* 6254, 6255; A Eberhard 'From State to Market and Back Again: South Africa's Power Sector Reforms' (2005) 40 *Economic and Political Weekly* 5309, 5316–5317; G Prasad & E Visagie 'Renewable energy technologies for poverty alleviation Initial assessment report: South Africa' (2005) Renewable *Energy Technology (RET) Working Group*

[63] ML Parry *et al*, *Intergovernmental Panel on Climate Change*, *Climate Change 2007: Impacts, Adaptation and Vulnerability – Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007) 459. ('There is also a need to identify and assess the barriers (technical, economic and social) to the transfer and adoption of alternative and renewable energy sources, specifically solar energy, as well as the design, implications, impacts and possible benefits of current mitigation options').

the study generally, does not invalidate its impact in law given the primacy of legal obstacles to renewable energy. Together with this, a certain level of knowledge of sources of renewable energy and existing laws in South Africa (which are in the public domain) has been assumed to dispense with the need for extensive descriptions of the law – rather focusing more on analysis of the laws and their implications for use of renewable energy.

1.7. Conceptual overview, definitions and technical terms

Throughout this study, terms and concepts, are used that require upfront clarification given their multiple meanings and contextual uses. The term 'energy' has a common understanding that is it is 'the ability to do work.'[64] Is there a common shared understanding of 'renewable energy', 'environmental law', 'regulation', 'sustainable energy', or 'sustainable development'? In this section, I provide definitions of these terms as they are used in this study. Significantly, not all renewable energy sources are sustainable.[65]

However, quite taxing questions rise regarding knowledge creation specifically, who determines what development is and what is sustainable development? By what standards and are such standards value-free or neutral? Are these all not western concepts informed by the capitalist western ideology of development as economic growth in the World Bank-UNDP dry statistical sense?[66] What do we, as Africans, consider to be socially, environmentally, economically, and politically sustainable development? These broad questions are beyond the scope of this study but are relevant to the terms that I use throughout the analysis. Renewable energy is part of the shift towards new

---

[64] JP Tomain *Ending Dirty Energy Policy: Prelude to Climate Change* (2011) 12-13 (adding further 'When we speak of energy, we are also speaking about the natural resources used in its production-energy and natural resources are inextricably linked throughout the fuel cycle from exploration to extraction to end use and disposal. Energy laws, policies and regulations, then, should not ignore the environmental effects that occur throughout the fuel cycle').

[65] I Dincer 'Renewable Energy and Sustainable Development: A Crucial Review' (2000) 4 *Renewable & Sustainable Energy Reviews* 157, 171.

[66] Human Development Index and World Bank GDP, GNP focused measurement of development overlooks other ways of seeing development.

ways of implementing sustainable development through the greening of technology.

1.7.1. Renewable energy, alternative energy and energy law

'Renewable energy' by definition refers to energy that can self-renew and will never run out, within the temporal understanding of human beings.[67] The dictionary definition is that renewable energy is

> '[e]nergy that is obtained from sources that are for all practical purposes inexhaustible, which includes moving water (hydroelectric power, tidal power, and wave power), thermal gradients in ocean water, biomass, geothermal energy, solar energy and wind energy.'[68]

Such would be, for instance, solar energy or energy from the ocean – waves and tides will be there as long as the sun and the moon shine and the wind blow.[69] The South African statutory definition is that renewable energy is, 'energy generated from natural non-depleting resources including solar energy, wind energy, biomass energy, biological waste energy, hydro energy, geothermal energy and ocean and tidal energy.'[70]

Renewable energy is also referred to as 'alternative energy' or 'alternative energy sources.'[71] However, these terms clearly do not precisely mean the same as 'renewable energy.' In one sense, 'alternative energy' refers to alternative sources as 'those [energy sources] *other* than the traditional sources, namely oil, gas, nuclear, hydro, and coal. These would include wind, solar, and biomass energy.'[72] In a second sense, 'alternative energy' could

---

[67] HA Strydom & AD Surridge 'Energy' in H Strydom & N King *Environmental Management in South Africa* 2nd ed (2009) 775 emphasising that strictly speaking, 'Energy cannot be renewed – the principle that entropy must increase militates against it. What is meant by the term "renewable energy" is that the energy content of a carrier is renewed-usually by the sun.'

[68] C Park *A Dictionary of Environment and Conservation* (2007) *Oxford Reference Online* (1 October 2010) <http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t244.e6826>.

[69] D Elliott *Sustainable Energy: Opportunities and Limitations* (2007) xviii.

[70] Section 1, National Energy Act 34 of 2008.

[71] As in alternatives to convention fossil-based sources of energy.

[72] ME Mansfield *Energy Policy: The REEL World: Cases and Materials on Resources, Energy, and Environmental Law* (2001) 559.

imply energy sources that are *alternatives* to traditional sources in the sense of being able to mimic these traditional sources.[73] These include shale gas, oil shale, tar sands, and synthetic fuels. In the electricity sector, some argue that nuclear energy could be an alternative source.[74] Any reference to 'renewable energy' in this study is a reference to the new primary renewable energies, namely wind, solar, the various ocean sources, and biomass that can be used to provide energy needs or to substitute for electricity uses.[75]

Importantly, this study concerns the regulation of energy and renewable energy and not necessarily specific forms and types of renewable energy; the latter are discussed and used as illustration only to demonstrate how law and regulation can be used as tools for social and economic change. As noted earlier, this study will not specifically analyse the utility or scientific feasibility of the various renewable energy sources, a task properly left to the natural sciences. Rather, Marchant correctly argues that when law is used to promote technologies it should not discriminate against some technologies or selectively promote some technologies as that is not the remit of law but rather of science, research, and economic development.[76]

There most viable sources of renewable energy in South Africa are mainly solar photovoltaic (PV), on and off-shore wind, landfill gas,[77] biomass and biogas;[78] and these have been the main focus of the Renewable Energy

---

[73] Ibid.
[74] Bosselman, Rossi & Weaver (note 22 above).
[75] Goldemberg (note 31 above) 26.
[76] GE Marchant 'Sustainable Energy Technologies: Ten Lessons from the History of Technology Regulation' (2009) 18 *Widener LJ* 831, 836.
[77] Good example is the award winning Ethekwini landfill-gas to electricity project providing Durban with over 7MW of power: Generating Electricity from Landfill Gas in Durban' (October 2015) < http://www.worldbank.org/en/results/2015/10/21/powering-electricity-landfill-gas-durban >
[78] Department of Energy, Renewable Energy Resource Assessment in South Africa' presentation by M Modise, Sofitel Hotel, Abu Dhabi (2013) <https://irena.org/DocumentDownloads/events/2013/July/Africa%20CEC%20session%203_RSA%20Department%20of%20Energy_Modise_220613.pdf>, L du Toit & J Glazewski 'Energy Law and the Environment' in J Glazewski & L du Toit (eds) *Environmental Law in South Africa* Service Issue 2 (November 2014) 18-11 to 18-12, A Miketa and B Merven 'Southern African Power Pool: Planning and prospects for renewable energy' (IRENA) (2013) < http://www.irena.org/documentdownloads/publications/sapp.pdf >

Independent Power Producers Procurement Programme (REIPPPP).[79] Other than the Solar Water Heating programme,[80] these are largely not directly subsidised but benefit from the procurement process and government support under the REIPPPP. Overall the potential for renewable energy sources in Africa included South Africa is well documented.[81]

1.7.2. Environmental law and policy

The term environmental law or environmental law and policy as used in this study refers to laws that are made with the aim of regulating natural resources and pollution that may, directly and indirectly, affect energy choices and how energy is produced and used. I use the term therefore as defined in the NEMA to the extent, it implicates electricity production processes.[82] The intertwined relationship between energy and environmental law as elaborated in Chapter 2 clearly shows that these two fields connect in different relationships of influence, impact, reinforcement, compliment, and conflict, with the latter two being the more pronounced relationships. These points of contact and overlap imply that

---

[79] Electricity Regulations on the Integrated Resource Plan for Electricity 2010–2030 GN R 400 in GG 34263 of 6 May 2011 (November 2013 update) (IRP2) 24, Table 3, 28, Table 4; International Energy Agency (IEA) *Introduction to Energy Technology Roadmaps (2014) (*providing the global statuses and contribution of various renewable sources to climate change.) <https://www.iea.org/media/training/presentations/etw2014/course4and5/Day_1_Session_1a_Roadmaps_Introduction.pdf>; Electricity Regulation Act (4/2006): Renewable Energy IPP Procurement Programme 2015: Determination Under Section 34(1) of the Electricity Regulation Act (4/2006) GN 733 published in GG 39111 of 18 August 2015.

[80] IRENA, Africa's Renewable Future: The Path to Sustainable Growth, Abu Dhabi (2013) 19 < http://www.irena.org/documentdownloads/publications/africa_renewable_future.pdf>,(until recently 'a rebate [was] paid directly to consumers, provided the product, supplier and installers are registered in the programme.'), see A Maqutu 'Solar water heater rebate uncertainty' *BusinessDay* (Johannesburg) 11 April 2014.
< http://www.bdlive.co.za/national/science/2014/04/11/solar-water-heater-rebate-uncertainty >

[81] IRENA (2015), Africa 2030: Roadmap for a Renewable Energy Future. IRENA, Abu Dhabi.
< http://www.irena.org/DocumentDownloads/Publications/IRENA_Africa_2030_REmap_2015_low-res.pdf > (South Africa leads in solar PV, while it is second to Morocco in wind energy growth and installed capacity. The growth of renewables especially solar and wind show huge cost reduction possibilities going forward.)

[82] Section 1 of the NEMA defines the 'environment' as 'the surroundings within which humans exist and that are made up of– (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.'

not all environmental laws are relevant to energy law and to this study. Environmental laws that govern the extraction, exploitation, use, and management of primary energy natural resources are considered central to this study.[83] Similarly, environmental laws that regulate the generation, transportation, disposal, and management of wastes generated by the energy sector are also relevant and will be discussed as and when relevant.

This study aims to understand the relationship between environmental law and energy law with a view to informing an understanding of the need for a legal framework that can promote renewable energy. Thus, not all environmental laws are relevant to the study, only those that have influential impact on primary energy sources such as water, coal, wind, air; planning and pollution control laws are germane. The statement by Guruswamy above[84] clearly shows the environmental laws that may be of relevance to a study on renewable energy law.

1.7.3. Sustainable development, sustainability, and sustainable energy

The NEMA (s 1(1)(xxix)), building on s 24(b) (iii) of the Constitution of South Africa, defines sustainable development as 'the integration of social, economic, and environmental factors into planning, implementation, and decision-making for the benefit of present and future generations.' The environmental right in the South African Constitution is firmly grounded in the spirit of sustainable development in its explicit attempt to foster integration of developmental issues when regulating to prevent pollution and promote conservation.

Internationally, the legal status of this concept remains clouded in uncertainty, but it has clearly become embedded in many international

[83] Such environmental laws include principles of environmental laws that underpin South African land-use planning and management, pollution control, and environmental enforcement legislation. These principles are in the NEMA, the NEMA Environmental Authorisation Regulations; s 24 of the Constitution of South Africa, the National Water Act 36 of 1998; the Air Quality Act 39 of 2004; National Environmental Management: Waste Act 59 of 2008; and the Mineral and Petroleum Resources Development Act (MPRDA) 28 of 2002.
[84] Guruswamy (note 57 above).

environmental treaties and national regimes.[85] Such treaties include the United National Framework Convention on Climate Change (UNFCCC), which aims to reduce GHG emissions that are documented to emanate largely from the energy industry.[86] In summary, by definition this concept means 'development, that meets the needs of the present without compromising the ability of future generations to meet their own needs' from the same natural resources.[87]

The courts have interpreted sustainable development in a number of cases culminating in the recent *Fuel Retailers*[88]case. In that case the court stated that the concept includes the idea of integration of social, economic and environmental considerations in decision-making, taking into account the limited resources on earth and the unequal distribution of these resources geographically and temporally, namely the notions of inter and intra generational equity.[89] Sands and Peel add that sustainable development can be broken down into the key components of intra and intergeneration equity, the principle of integration and the idea of limits to what we can do with natural resources.[90] The consensus is that the components of sustainable development

---

[85] J Elliott *An Introduction to Sustainable Development* (2012) 18-19; Magraw & Hawkes, ibid 623; JB Robinson & Herbert D 'Integrating Climate Change and Sustainable Development.' (2001)1 *International Journal of Global Environmental Issues* 130-149; art 10 read with art 2 UN Convention on Biological Diversity (1992); art 5(d) UN Desertification Convention.

[86] See Art 3 (1) & (4) of the UNFCCC (specific references to future generations and sustainable development among the principles underpinning the Treaty).

[87] World Commission on Environment and Development (WCED) *Our Common Future* (1987) Part 1 Ch 2,1; J Glazewski 'The Nature and Scope of Environmental Law' in Glazewski & du Toit (note 78 above) 1-16, 1-17. For further discussion of the concept of sustainable development see the following authorities and cases: DB Magraw & LD Hawkes 'Sustainable Development' in D Bodansky, J Brunnée & E Hey *The Oxford Handbook of International Environmental Law* (2007) 637; AE Boyle & D Freestone *International Law and Sustainable Development: Past Achievements and Future Challenges* (1999) 26; T Murombo 'From Crude Environmentalism to Sustainable Development: *Fuel retailers'* (2008) 4 *SALJ* 488; *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province & others* 2007 (6) SA 4(CC); *MEC, Department of Agriculture, Conservation and Environment v HTF Developers (Pty) Ltd* 2008 (2) SA 319 (CC) para 61; *BP Southern Africa (Pty) Ltd v MEC for Agriculture, Conservation, Environment & Land Affairs* 2004 (5) SA 124 (W).

[88] *Fuel Retailers* case (note 87 above) was the Constitutional Court climax of many cases in which the High Court had interpreted the meaning, role, and function of the concept of sustainable development in South African environmental regulation.

[89] These two concepts, regarded as components of sustainable development are aimed at promoting equality or equity in terms of access to natural resources and sharing the burden the brunt of using natural resources (environmental justice), see J Elliott (note 85 above) 20.

[90] P Sands & J Peel *Principles of International Environmental Law* (2012) 213-215.

are clearly understood, but there is equal consensus that it is very difficult to implement and measure sustainable development.

In the context of energy law and renewable energy law, the concept of sustainable development gave birth to the concept of 'sustainable energy' which refers to the application of principles of *sustainability*[91] to the energy industry. I use the term 'sustainable energy' in the sense, of energy that is derived from sources that are not only *renewable*, but also *sustainable* in the Brundtland sense.[92] This distinction is necessary to distinguish those renewable energy sources that are not necessarily sustainable. Thus for instance, the development of hydro energy in a water-scarce country may be unsustainable if the water resources cannot sustain that type of use in the long term, or if it is going to lead to other irreversible social, economic, and environmental problems. Russell defines sustainability in the context of energy law as follows:

> The term, "sustainability" has a range of meanings. Perhaps the most common use of the term today is within the context of "sustainable development." The term "sustainable development" typically refers to the ability to develop economically while sustaining the physical integrity of the planet. Recent concerns about global climate change have led many to focus on energy as an integral part of the sustainability challenge.[93]

She summarises by saying that '[t]he basic notion of sustainability is easily understood: Use it, but don't use it up. The idea is not new.'[94] In this study therefore 'sustainable energy' and 'sustainability' in relation to energy, are used in the sense of energy sources that are capable of self-replenishing and use of such sources within the limits of their natural regenerative capacity. The question of what sources of energy are sustainable is by no means

---

[91] D Elliott *Sustainable Energy: Opportunities and Limitations* (2010), defined by Park (note 68 above).
[92] Author of *Our Common Future* (note 87 above). Energy sources that enable current generation to meet their energy needs without compromising the ability of future generations to meet their own energy needs as well as without compromising the integrity of the environment we current generations will hand over to posterity.
[93] Russell (note 21 above) 121.
[94] Ibid 124.

straightforward and there are no simple answers.[95] It must be emphasised that not all sustainable energy sources are renewable and the converse equally holds true.

Evidently, scholars across disciplines have debated and written on the concept of sustainable development as it transcends the silos of scholarship developed over time. The inclusion of the concept in environmental legislation and international treaties, especially the UNFCCC, confirms the causal connection between energy generation activities and air pollution through which climate change occurs. This is central to a major argument in this study that pollution control environmental law could do more to moderate the use of natural resources in energy generation to promote sustainability. Recently, sustainable development as a concept, is giving way to new concepts such as 'resilience', 'green economy' and 'green growth' viewed as alternative pathways to sustainability or alternatives to orthodox development thinking.[96]

Increasingly, the practicability of sustainable development is questioned with some suggestions that new conceptual frameworks are needed to direct the debate on sustainability.[97] Robinson rightly argues that '[o]bjective trends call into question the efficacy of contemporary notions of sustainable development. Why have salutary reforms for sustainable development been overwhelmed by unsustainable 'business as usual' growth patterns?'[98] An interrogation of the 'business as usual' glorification of economic growth on the

---

[95] A Sterling 'Renewables, Sustainability and Precaution: Beyond Environmental Cost-Benefit and Risk Analysis' in RE Hester & RM Harrison *Sustainability and Environmental Impact of Renewable Energy Sources* (2003) 113.

[96] E Barbier 'The Policy Challenges for Green Economy and Sustainable Economic Development' paper presented at the Natural Resources Forum (2011); A Cosbey 'Trade, Sustainable Development and a Green Economy: Benefits, Challenges and Risks' (2011); J Ocampo 'The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective – Summary of Background Papers' paper presented at the United Nations Report by a Panel of Experts to Second Preparatory Committee Meeting for UN Conference on Sustainable Development (2011).

[97] A more vocal movement is the 'resilience' thinking school for which see generally BH Walker & D Salt *Resilience Thinking: Sustaining Ecosystems and People in a Changing World* (2006); LHL Demange 'The Principle of Resilience' (2012) 30 *Pace Environmental LR* 695-1278; NA Robinson 'The Resilience Principle' (2014)5 *IUCN Academy of Environmental Law eJournal* 19.

[98] NA Robinson 'Beyond Sustainability: Environmental Management for the Anthropocene Epoch.' (2012) 12 *Journal of Public Affairs* 181,181.

back of unsustainable energy-intensity informs the use of the idea of sustainable energy in this thesis.

1.7.4. The concept of regulation

Regulation is central to this study; hence, a slightly more detailed elaboration of the conception of regulation used in the study is necessary. In simple terms, regulation in this study means the use of rules and policies to motivate or control activities towards a goal or goals and to create and maintain social, economic, and political order.[99] In addition to this narrower traditional sense, 'regulation' is also conceived of as including modern ways of promoting social or economic behaviour modification including incentive-based methods. In our context, this relates mainly to economic and social order created by incentives or rules-based controls that determine energy choices by generators and consumers alike.[100]

The concept of 'regulation' is spoken of as a given term that is commonly understood by every reader. A review of the literature on regulation reveals that this concept is, not only contested, but also that it has multidisciplinary variability.[101] The concept of 'regulation' is also associated in the narrow sense with traditional 'command and control' forms of regulation, yet in modern times it encompasses a broad range of instruments to achieve regulatory objectives including incentives. Baldwin and others propose three senses in which the

---

[99] J Black 'Critical Reflections on Regulation' (2002) 27 *Aust. J Legal Phil*osophy 1 (elaborating on the different understandings and definitions of concept of 'regulation' from discipline to discipline); see also B Barton 'The Theoretical Context of Regulation' in B Barton, et al (eds) *Regulating Energy and Natural Resources* (2006), 11-13.

[100] DK Smith 'What is regulation? A Reply to Julia Black' (2002) 27 *Austl. J Legal Philosophy* 39. Black, (note 99 above) 1, 27 (adding that these definitions are not neutral).

[101] R Baldwin, C Scott & C Hood *A Reader on Regulation*, Oxford Readings in Socio-Legal Studies (1998) 2-3 ('There is no single agreed meaning of the term, but rather a variety of definitions in usage, which are not reducible to some platonic essence or single concept…'); R Brownsword *Rights, Regulation, and the Technological Revolution* (2008) 7 (concept of regulation has become unwieldy); A Ogus, 'Regulatory Law: Some Lessons from the Past' (1992) 12 *Legal Studies* 1 3; AI Ogus & and CG Veljanovski, *Readings in the Economics of Law and Regulation* (1984). See Chapter 6 generally; J Black 'Decentring Regulation: Understanding the Role of Regulation and Self Regulation in a "Post-Regulatory" World' (2001) 54 *Current Legal Problems* 103-146.

term may be understood, firstly 'as a specific set of commands,'[102] secondly 'as deliberate state influence,'[103] and third 'as all forms of social or economic influence.'[104] These three possible understandings confirm the fluidity of the notion of regulation, but the authors also conclude that:

> it should be noted that regulation is often thought of as an activity that restricts behaviour and prevents the occurrence of certain undesirable activities (a 'red light' concept). The broader view is, however, that the influence of regulation may also be enabling or facilitative ('green light') as, for example, where the airwaves are regulated to allow broadcasting operations to be conducted in an ordered fashion, rather than left to the potential chaos of an uncontrolled market.[105]

This supports the underlying argument of this study, that to promote behaviour that tends towards renewable energy choices, legal regulation is necessary. As argued in Chapter 3 and 4, this could be through disincentives (pollution control and environmental compliance) – 'red light' or positive incentives (capital investments and subsidies) – 'green light'.

Most research done on regulation is by social scientists and there are few legal writings on regulation as a legal process or activity. This uncertainty regarding what is meant by regulation implies that it is difficult to sustain an argument for regulation without defining what it is intended to convey. In simple terms, regulation may refer 'to the use of the law to constrain and organise the activities of business and industry'[106] or as 'consensual theorists' argue, regulatory policies may be aimed at controlling powerful groups to protect the interests of the less powerful majority (the public interest).[107] On the other hand, 'conflict theorists' argue that business and industry have institutionalised their

---

[102] R Baldwin, M Cave & M Lodge *Understanding Regulation: Theory, Strategy, and Practice* (2011) 3 (regulation as law making producing commands to be obeyed e.g. environmental, health and safety).

[103] Ibid (regulation as an act to influence social and business behaviour); see also W Abrahamse & J de Groot 'The Psychology of Behaviour Change: An Overview of Theoretical and Practical Contributions' in S Fudge et al *The Global Challenge of Encouraging Sustainable Living: Opportunities, Barriers, Policy and Practice* (2013) 3).

[104] Baldwin, Cave & Lodge (note 102 above) (regulation is not initiated by the state only but also by other institutions – including self-regulation – with multiple 'deliberate' or 'incidental' objectives and outcomes).

[105] Ibid 3.

[106] BM Hutter *Compliance: Regulation and Environment* (2004) 4-5.

[107] Ibid.

domination of the law and policy-making processes such that resulting regulations are ineffective.[108] In this conception, regulation is neither 'objective' nor 'neutral.'[109]

Ogus, taking an economic perspective, conceives of regulation as an economic intervention to reign-in on the excesses of the market to protect the public collective good.[110] This resonates with the conclusion by Baldwin and others above.[111] Hutter, concurring, frames this market control conception of regulation thus:

> The market system gives rise to a private-interest theory of regulation, which regards private interest groups as securing regulatory benefits for themselves through their use of the political and legal systems. A collectivist view of regulation gives rise to public - interest theory that regards regulation as a corrective to the operation of the market and as operating in pursuit of collective goals.[112]

The literature on regulation, in addition to this economic understanding, also adds a social view of regulation, which is often indistinguishable from the economic view, except that the latter has more pronounced financial overtones.[113]

The most preferred definition of regulation in literature is that proffered by Julia Black, who defines it as 'sustained and focused attempts to change the behavior of others in order to address a collective problem or attain an identified end or ends, usually through a combination of rules or norms and some means for their implementation and enforcement, which can be legal or non-legal.'[114] Elsewhere she adds that, '[r]egulation is thus understood here to be intentional,

---

[108] Hutter (note 106 above) 4-5.
[109] C Mitchell & B Woodman 'Regulation and Sustainable Energy Systems' in M Cave, R Baldwin & M Lodge *The Oxford Handbook of Regulation* (2010) 572, 582.
[110] Al Ogus 'Regulation Revisited' (2009) 2 *Public Law* 332, 340.
[111] Baldwin, Cave & Lodge (note 102 above).
[112] Hutter (note 106 above) 6.
[113] Ibid 7; see also Abrahamse & de Groot (note 103 above) 5.
[114] J Black 'Constructing and Contesting Legitimacy and Accountability in Polycentric Regulatory Regimes (2008) 2 *Regulation & Governance* 137, 139. See also J Black 'Critical Reflections on Regulation' (2002) 27 *Australian Journal Legal Philosophy* 1, 26.

goal- directed, problem-solving attempts at ordering undertaken by both state and non-state actors.'[115]

Building from Black's definition, Roger Brownsword explains that if regulation is a social instrument of controlling behaviour towards certain outcomes, then 'legislation [law] is a certainly a species of regulation.'[116] He notes, however, that since regulators use strategies beyond legislation or law to effect regulation, then law as such is quite a narrower concept than regulation, that is, regulation is about much more than simply using law to control behaviour.[117] Brownsword acknowledges though, that regulation also excludes other regulatory tasks of law such as dispute resolution and constitution making, thus making law in another sense broader than regulation. This conceptual dissonance leads him to conclude that '[w]e might infer, therefore, that while law and regulation intersect with one another, they are not co-extensive.'[118] A consensus thus emerges in regulation literature, that the relationship between law and regulation is not straightforward. Hence, Croley concludes that 'the truth is that regulation is too complex and too variant for quick measurement or pithy generalisation.'[119] No wonder therefore that regulation of energy and utilities have remained complex tasks.

Nevertheless, the literature reviewed here overwhelmingly supports the argument that law is one instrument through which regulation can be effected or be made effective. Chapters 3 and 4 substantiate this thesis by analysing specific areas of regulation, such as environmental regulation, pollution control and land use planning as forms of legal regulation that can steer behaviour towards low carbon, renewable energy. Such impact assumes other interventions such as social pressure and other behaviour modification strategies to shape energy choices. The intellectual engagement with the concept of regulation by Black, Brownsword, Baldwin, Cave, and others clearly shows that regulation is a contested concept. It follows that the analysis in this

---

[115] J Black 'Regulatory Conversations' (2002) 29 *Journal of Law & Society* 163, 170.
[116] R Brownsword *Rights, Regulation, and the Technological Revolution* (2008) 6-7.
[117] Ibid 6-7.
[118] Brownsword (note 101 above).
[119] SP Croley *Regulation and Public Interests: The Possibility of Good Regulatory Government* (2009) 306.

study of regulating the energy sector to increase use of renewable energy is a complex task. Further elaboration of the various theories of regulation is peripheral to the focus on this study.

1.7.5. Feed-in-Tariffs

Feed-in-tariffs (FITs) are one of the various economic instruments that can be used to provide incentives for renewable energy technology to break into a market.[120] They consist of a regulator and government intervention to control the pricing of electricity produced from renewable energy sources to promote investment and market entrance.[121] The purpose is to ensure that established utilities, that often control the transmission and distribution network, do not outcompete new market entrants.[122] They are often used together with purchase obligations that require established utilities to buy electricity produced by the beneficiaries of FITs for a given period.[123] With time, it is expected that the young new technology would become competitive and survive in the market without the need of preferential tariffs. In this study, FITs are discussed with particular reference to the policy framework[124] developed by the National Energy Regulator of South Africa (NERSA) to implement FITs to promote renewable energy use. The concept is explored in detail in Chapter 6.

1.7.6. Renewable Energy Independent Power Producers Procurement programme (REIPPPP)

The Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) is South Africa's flagship renewable energy

---

[120] M Mendonça, D Jacobs & BK Sovacool *Powering the Green Economy: The Feed-in Tariff Handbook* (2009)
[121] J Nganga, M Wohlert & M Woods 'Powering Africa through Feed-in Tariffs: Advancing renewable energy to meet the continent's electricity needs' A Study for the World Future Council (WFC), the Heinrich Böll Stiftung (HBS) and Friends of the Earth England, Wales & Northern Ireland (FoE-EWNI) (2013) 14.
[122] Ibid10.
[123] Ibid 21.
[124] National Energy Regulator of South Africa (NERSA) of a Renewable Energy Feed-In Tariff (REFIT) Guidelines (March 2009) <http://www.nersa.org.za/UploadedFiles/ElectricityDocuments/REFIT%20Guidelines.pdf >;

procurement programme. This is an auction-based process for procuring new generation capacity as determined in terms of the new generation regulations.[125] It is implemented by the Department of Treasury, Department of Energy, the National Energy Regulator, and Eskom. The design of the programme consists of an auction system (popularly known as the bidding programme) in terms of which independent power producers (IPPs) are called to submit proposals (bids) to supply electricity from specified resources up to certain mega wattage. There is a cap on the bid price to promote competition and successful bidders conclude a tri-partite agreement to enable them to generate and feed electricity into the national grid. The FITs and REIPPPP are compared in detail in other studies.[126] In this study, the focus is on their use as legal tools to promote renewable energy use.

1.8. Major premises underlying the study

A number of broad arguments underlie this study. Firstly, I posit that law, specifically energy and environmental law in the context of renewable energy in South Africa, are not sufficiently developed to play the role that they ought to in ensuring that South Africa achieves sustainability in the energy sector. Currently these laws seem to play a peripheral legitimating role (in relation to established fossil-based energy technologies) contrary to what they should be doing within

[125] IRENA, Africa 2030: Roadmap for a Renewable Energy Future. IRENA, Abu Dhabi, (2015) 53.
<
http://www.irena.org/DocumentDownloads/Publications/IRENA_Africa_2030_REmap_2015_low-res.pdf >

[126] For detailed study see L Du Toit 'Promoting renewable energy in South Africa Through the Inclusion of Market-based Instruments in South Africa's Legal and Policy Framework with Particular Reference to the Feed-in Tariff.' Thesis presented for the degree of PhD at the University of Cape Town (2014) especially 133-193.

the spirit of the concepts of sustainable development, sustainable energy, and to promote development goals.[127]

It is also submitted that whether renewable energy technologies are sustainable depends on the social, economic, and political context and governance of each country. For instance, there are strong arguments on the sustainability of nuclear energy in some countries, while it is not inconceivable to argue that coal may be the *economically* sustainable source in South Africa. Andrew Sterling concludes that the sustainability of nuclear is still a vexed question among scholars, depending so much on whether the assessment of sustainability is based on a 'precautionary', scientific, or risk-based approach.[128]

Renewable energy and relevant environmental laws should be incentivising and facilitating the technological transition from unsustainable fossil-based energy towards renewable energy. This is premised on the conception of law as one of the social and economic instruments that can be used to control and shape behaviour and development. I thus argue that, among other factors, the separate development of energy law and policy on the one hand and environmental law and policy on the other is obstructing the adoption of renewable energy technologies in South Africa. This is in addition to other barriers and governance challenges that have impeded integrated environmental management generally in South Africa.

1.9. On the methodology

In addition to, and in order to execute the research activities outlined above,[129] key background and contextual information will be gathered from a desk study, review and analysis of primary sources of law, such as legislation and government policy documents relating to energy generally in South Africa and

[127] While there is no MDG on access to energy as such, energy is one of the indicators of achievement of MDG 7 to ensure environmental sustainability, see Goldemberg & Johansson (note 31 above) 18; see also UN General Assembly Resolution 60/199 (2006) on Promotion of New and Renewable Sources of Energy, including the implementation of the World Solar Programme A/RES/60/199. Recently the UNGA in a review of progress made in achieving the MDGs noted the significance of energy to the attainment of many of the goals especially in developing countries; see clause 47 resolution of 1 September 2010.
[128] Sterling (note 95 above) 113. See also Farouk (note 8 above) 19.
[129] Part as 2.1 above.

secondary literature. Where relevant and necessary, this information is analysed in the backdrop of comparative regulatory and legal documents from other jurisdictions that have successfully developed legal frameworks to facilitate the transition to renewable energy. Such jurisdictions include the German, Spain, United States, Australia, Denmark, and India without any dedicated comparative study of these jurisdictions. The idea is to be able to make references to these countries by way of illustrative examples of specific aspects of an argument and not to do a full-blown comparative analysis.

While the study relies heavily on primary and secondary legal sources such as statutes, policy documents, relevant cases and secondary writings; it must be noted that policy documents and secondary analysis represent the views of the government and the private sector. These provide insights into the current challenges faced by those interested in investing in renewable energy technologies (the barriers being faced) and the challenges being faced by regulatory agencies in facilitating integration of renewables into the South African energy mix. Relevant stakeholders and interested parties have consistently expressed their positions and views on the study questions, and sufficient primary fieldwork material and reports are available to substantiate the arguments advanced.[130]

The position of the government of South Africa on renewable energy is gathered from legislation and policy documents sponsored by NERSA and the Department of Energy, while environmental law and policy positions are available from the Department of Water and Environmental Affairs. The IPPs have formed lobby groups and bodies that have generated considerable literature on their vision for renewable energy in South Africa and such

[130] See recent and current empirical studies by DR Walwyn & AC Brent 'Renewable Energy Gathers Steam in South Africa' (2015) 14 *Renewable and Sustainable Energy Reviews* 390-401; L Baker & H Wlokas 'South Africa's Renewable Energy Procurement: A New Frontier' *Tyndall Centre for Climate Change Research* (2014); A Eberhard 'South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons' (2014); KN Gratwick & A Eberhard 'An Analysis of Independent Power Projects in Africa: Understanding Development and Investment Outcomes' (2008) 26:3 *Development Policy Review* 309-338; A Eberhard & KN Gratwick 'When the Power Comes: An Analysis of IPPs in Africa.' *Report prepared for the Infrastructure Consortium on Africa* (2011) (comparative study of the experiences of IPPs in 11 Sub-Saharan countries).

publications provide a clear statement of their policy positions.[131] All this is sufficient to sustain a critical study of the role and possible functions of law in promoting renewable energy in South Africa.

This study is supported by research based on various sources, particularly primary sources. The primary sources include South Africa's energy and environmental legislation and policies, among them the Energy and Renewable Energy White Papers, Climate Change Response White Paper, Integrated Resource Plan for Electricity, FITs Policies, and REIPPPP documents. Secondary sources on energy law are nascent but the environmental sources that also deal with energy law have been useful in this study, particularly the following texts.

Relevant literature in field of study is reviewed in a mainstreamed manner throughout the thesis and where it is relevant. The methodological consideration that informed a mainstreamed review of literature was to avoid needless repetition. Nevertheless, in brief key writings in energy law advance the following arguments and positions:

- There is a common understanding that there is a need to move from non-renewable ways of producing energy towards renewable energy.

- This transition is necessary not only to save the exhaustible resources, but also to adapt and mitigate the effects of climate change caused by the emissions of GHGs from energy-related activities as well as promoting sustainable development and poverty alleviation.[132]

---

[131] South African National Energy Association (SANEA) <http://www.sanea.org.za>, South African Wind Energy Association (SAWEA) <http://www.sawea.org.za/resource-library/research-studies.html>

[132] YO Omorogbe 'Promoting Sustainable Development Through the use of Renewable Energy: The Role of the Law', in DN Zillman, C Redgwell, Y Omorogbe & LK Barrera-Hernández (eds) *Beyond the Carbon Economy: Energy Law in Transition* (2008) 39; C Fräss-Ehrfeld *Renewable Energy Sources: A Chance to Combat Climate Change* (2009); 'Climate change and development: Towards an alternative energy future for southern Africa?' Proceedings of the IGD/FES Conference held in Tshwane/Pretoria, South Africa on 17-18 August 2009' (2009); Barton (note 99 above).

- This transition to renewable energy must be supported by other energy-saving strategies especially energy efficiency. However, some authors do point out the undesirability of using law to force technology and believe that the market should be left to play its role in promoting renewable energy.[133]

- There is also a consensus that the shift to renewable energy is not happening at the desired pace, and this is attributable to various factors ranging from the nature and types of renewable energy sources that can commercially be deployed to a difficulty toppling economically and politically entrenched technologies that have driven the energy industry and economic development over centuries.[134]

- A number of the secondary sources do advance the argument that policy and regulatory reforms are necessary to ensure the transition to renewable energy, and this is the aspect that this study intends to pursue further and in greater depth.[135]

1.10. Synopsis of chapters

The thesis consists of seven chapters, which are arranged into thematic groups. This Chapter 1 and Chapter 2 are background chapters that provide the theoretical, analytical, and socio-economic context of the study, including a justification of the need for regulation. Chapter 3 to 5 forms the core of the

[133] O Edenhofer 'The IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation' (2011); Strydom & Surridge (note 67 above); Barton (note 99 above).
[134] C Mitchell *The Political Economy of Sustainable Energy* (2008); R Lyster & AJ Bradbrook *Energy Law and the Environment* (2006) 28-29; A Pegels 'Renewable Energy in South Africa: Potentials, Barriers and Options for Support' (2010) 38 *Energy Policy* 4945; S Karekezi & T Ranja, Network African Energy Policy Research & Institute Stockholm Environment *Renewable Energy Technologies in Africa* (1997) and Martinot (note 38 above).
[135] H Scheer *The Solar Economy: Renewable Energy for a Sustainable Global Future* (2013); D Elliott (note 69 above); CJ Cicchetti *Going Green and Getting Regulation Right: A Primer for Energy Efficiency* (2009); AB Sebitosi & P Pillay 'Grappling with a Half-hearted Policy: The Case of Renewable Energy and the Environment in South Africa' (2008) 36 *Energy Policy* 2513, 2516.

thesis focusing on sustained analyses of the issues raised in research questions. The obstacles to renewable energy are discussed at the outset in Chapter 3 bearing in mind however that the study is a juridical analysis the social, economic and behavioural obstacles are discussed only to provide context. Chapter 4 in addition to explaining the energy regulatory framework also includes the analysis of the shortcomings of this existing framework addressing the barriers to renewable energy discussed in Chapter 3. Chapter 5 is an analysis of the environmental legal framework to the extent that it interacts with energy law to entrench conventional energy sources and exacerbate the barriers to renewable energy. An argument is made for addressing legal fragmentation as one of the key measures to enable energy and environmental laws to promote renewable energy in South Africa's energy mix. That analysis acknowledges that regulatory fragmentation is, only one, of many (including non-legal) obstacles to renewable energy that are explored in Chapter 3. In Chapter 6, the thesis exposes what have been the regulatory responses to the barriers to renewable energy so far, in terms of government and market regulation to open the market for renewables. Chapter 7 concludes with recommendations on how law can better be used as a tool to promote renewable energy in South Africa.

Chapter 2
The Imperatives for Regulating Energy

2. Introduction

The establishment and entrenchment of conventional energy fossil sources was accomplished through a legal system that legitimised and perpetuated that domination.[1] Energy law and current reforms towards renewables in South Africa are not articulated within a nuanced regulatory theoretical foundation to dislodge that status quo. Legal regulation is crucial to the establishment of a viable renewable energy industry that can contribute a higher percentage to South Africa's energy mix.[2] Without legal regulation, no monopolies would have arisen and the energy market would have operated in a chaotic regulatory vacuum. While economists largely explain monopolies based on market forces, it is submitted that the environment that allows the development of monopolies includes the legal and institutional superstructure within which markets operate. The economic regulators design the regulatory environment that conduces to monopolistic behaviour. Once matured, the laws and institutions that regulate the existing energy system reinforce the system and become so entrenched that it is difficult to reform the laws and institutions without changing the market environment.[3]

The relationship between energy production processes and resulting environmental problems require integrated regulation, especially renewable electricity and the global and local problems that renewable energy is likely to solve. While regulation, *per se*, will not altogether clean the air and the waters of earth; it can at least ensure that we understand the extent to which the energy sector is affecting the environment and thereby the degree to which we can

---

[1] C Mitchell & B Woodman 'Regulation and Sustainable Energy Systems' in M Cave, R Baldwin & M Lodge *The Oxford Handbook of Regulation* (2010) 572, 583.

[2] The law is being called upon to provide security for investments, guarantee rights, provide regulatory certainty and enable long-term energy planning to create the right environment for renewables to thrive. A Eberhard 'South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons' (2014) 7; C Mitchell *The Political Economy of Sustainable Energy* (2008) 2 (current paradigm constraint innovation); A Eberhard 'From State to Market and Back Again: South Africa's Power Sector Reforms' (2005) *Economic and Political Weekly* 5316; Department of Energy, 'Outcomes of The National Energy Summit' 25-27 September 2007, 66; S Nel 'Transforming the Energy Supply Industry' (2012) 64 *FOCUS* 15, 21 and 41.

[3] Mitchell & Woodman (note 1 above) 584.

leverage energy resources to promote environmentally sustainable development.[4]

In this Chapter, it is argued that, without effective legal regulation, the energy sector and users will overlook the role of renewable energy.[5] Secondly, absent legal regulation, it could take longer than necessary for renewable energy to play a role in addressing environmental problems wrought by heavy reliance on fossil-based energy. There is a strong link between energy, the economy, the environment and society and this area of convergence must be exploited to the benefit of every sector and specially to address global environmental problems. The Chapter opens by further elaborating on the analytical context introduced in Chapter 1, specifically outlining the current energy situation in South Africa, in the legal context of the intricate linkages between energy, environment and economy, the sources of renewable energy in South Africa and the international context. Lastly, the Chapter analyses the justifications for using legal regulation to promote renewable energy and characterises the functions of such regulation. This discussion foregrounds the more focused juridical analysis of the energy and environmental laws of South Africa in Chapter 4 and 5.

2.1. The analytical context of the study

While analysing the legal challenges to a progressive renewable energy legal framework in South Africa, this study does not tackle all of these challenges; the analysis particularly considers the following context:

[4] D Helm *Energy, the State, and the Market: British Energy Policy since 1979* (2004) 12. ('Regulation, then, is not an afterthought to energy policy, as the architects of the privatizations thought, but an inherent part of the framework provided by the state within which the market functions. Rules need to be defined not only to limit abuse, but also to provide protection to investors.')

[5] Ibid. 12 (adding that 'market-based instruments are not always the best route, and sometimes more direct regulation is needed.')

While energy is indispensable for socio-economic growth (development),[6] this growth could be hampered by the lack of an effective, facilitative legal framework to promote sustainable renewable energy.[7] Hence, regarding the role of law in renewable energy, Lyster and Bradbrook note that:

> the extent to which sustainable energy technologies are adopted in Australia and elsewhere depends on a variety of *largely unrelated factors.* The most important of these are the degree of research activity conducted by private and public research institutions; the level of government assistance provided the economics of renewable energy and energy efficient technologies, the degree of social acceptance of alternative energy technologies and the level of public education in issues of sustainable development. *Another important, and sometimes overlooked, factor is the role of law.*[8]

These sentiments resonate with equal force to South Africa, as the function of law in promoting renewables is not necessarily affected by jurisdictional constraints.

Lyster and Bradbrook conclude by unequivocally arguing that, in addition to playing the regulatory function, law is indispensable in addressing the rest of the factors noted above.[9] The role that law and regulation play in promoting renewable energy is visible in jurisdictions that have made renewable energy a

---

[6] J Goldemberg 'Development and energy' in AJ Bradbrook & RL Ottinger *The Law of Energy for Sustainable Development* (2005) 37; TB Johansson 'The Imperatives of Energy for Sustainable Development' in Bradbrook & Ottinger 49, 47; J Goldemberg *Energy, Environment and Development* (1996) 1, 90; YO Omorogbe 'Promoting Sustainable Development Through the use of Renewable Energy: The Role of the Law', in DN Zillman, C Redgwell, Y Omorogbe & LK Barrera-Hernández (eds) *Beyond the Carbon Economy: Energy Law in Transition* (2008) 39, 41. ('Energy is the single most important component of any development strategy.')

[7] RL Ottinger & R Williams 'Renewable Energy Resources for Development' (2002) 32(2) *Environment Law* 101; S Calyolsen 'Tangled in the Wires: An Assessment of the Existing US Renewable Energy Legal Framework' (2006) 46 *Natural Resources Journal* 759, 760; IS Russell 'The Sustainability Principle in Sustainable Energy' (2008) 44 *Tulsa LR* 121,121; SR Tully 'The Contribution of Human Rights to Universal Energy Access' (2006) *4 Nw Univ J Int Human Rights* 518, 525-526 (arguing that access to energy is a sure way to alleviate poverty). However, there are arguments to the contrary with regard to the contribution that 'renewable energy' can play in development given its costs relative to other forms of energy.

[8] R Lyster & AJ Bradbrook *Energy Law and the Environment* (2006) 28-29 *(my emphasis)*; J Goldemberg & TB Johansson (eds) *World Energy Assessment Overview: 2004 Update* (2004) 5, 68 <http://www.undp.org/energy/weaover2004.htm> (concurring that '*whether and how well'* can energy contribute to development depends on 'access to information and technologies, the availability of finance and supporting institutions, attitudes and behaviours, and – *in particular – policies and policy frameworks that encourage change in the desired direction*') *(my emphasis).*

[9] Lyster & Bradbrook (note 8 above); GE Marchant 'Sustainable Energy Technologies: Ten Lessons from the History of Technology Regulation' (2009) 18 *Widener LJ* 831, 831; see also generally Omorogbe (note 6 above).

major component of their national energy mixes. Thus, I argue that in Germany, without the Renewable Energy Sources Act of 2008 (EEG),[10] wind energy would not have grown exponentially in the country's energy mix. Similarly, in Spain,[11] Denmark,[12] and China[13] renewable energy could only play a significant role with the support of a decisive and predictable legal framework, albeit imperfectly designed in some of these countries.

The South African legal environment is not conducive to large-scale commercial deployment of renewable energy in the electricity sector, which is the primary focus of this study. To promote sustainable development through economic growth, South Africa should create an enabling legal environment for renewable energy sources. Such legal regulation could adopt various approaches or strategies that are investigated and analysed in Chapter 6 below. That these strategies have worked with varying degrees of success elsewhere is no guarantee that they will work in the South African social, economic, governance and political environment. Nevertheless, this thesis argues that, as a starting point to give impetus to legislative thinking, these strategies are desirable approaches that must be analysed and contextualised.

---

[10] Act implementing Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market (OJ L 283, 33), as last amended by Directive 2006/108/EC of the Council of 20 November 2006 (OJ L 363, 414).

[11] A Ciarreta, MP Espinosa & C Pizarro-Irizar 'Is Green Energy Expensive? Empirical Evidence from the Spanish Electricity Market. (2014)69 *Energy Policy* 205, 210 (reporting from an empirical study that regulation enabled renewable energy to break into the Spanish energy market and influence energy prices and the market itself); Generally, I Del Guayo 'Security, Continuity, and Regularity of Energy Supply: The Case of Spain' in B Barton, C Redgwell, A Rønne & DN Zillman *Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (2004) 355, 364-365. The intention is not to embark on extensive comparative analysis but successful countries are cited for illustrative purposes only. The references provided point readers to detailed studies done on those countries.

[12] Danish Energy Association *Danish Electricity Supply, Statistics* 2001, 31 and 32; Electricity Supply Act 1999; s 10A Act on Utilization of Renewable Energy Act 302 of 16 May 1990, and Order No. 270 of 2 May 1991 on Type Approval and Certification of Wind Turbines.

[13] Renewable Energy Law of the People's Republic of China, <http://www.renewableenergyworld.com/rea/news/article/2005/03/china-passes-renewable-energy-law-23531 > analysed in detail by S Schuman & A Lin 'China's Renewable Energy Law and its Impact on Renewable Power in China: Progress, Challenges and Recommendations for Implementation' (2012) 51 *Energy Policy* 89, 90; see also generally JA Cherni & J Kentish 'Renewable Energy Policy and Electricity Market Reforms in China' (2007) 35 *Energy Policy* 3616, 3627.

South Africa remains one of the largest air polluters and it is 12th on the world's list of top GHG emitters mainly from energy generation, which is the primary cause of global warming and its sequel, climate change.[14] South Africa is not legally bound to take steps to reduce its GHG emissions being a non-Annex developing member of the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to the UNFCCC.[15] The country, however, has reporting and god faith obligations.[16] Persistence in sourcing energy from conventional fossil sources could be construed as a step contrary to South Africa's obligations under the international laws governing climate change and the emission of GHGs. These international imperatives therefore must act as push factors towards a transition to more renewables in its energy mix.[17]

In the Southern African Development Community (SADC) region, South Africa leads in terms of technology, development and research and it should take the initiative to lead the whole sub-region towards a sustainable energy future. This is significant, not least because South Africa also exports electricity to many Southern African countries. The idea of South Africa taking the initiative is not only politically important, but also economically sensible as renewable energy will become the energy of choice in the future and South Africa can position itself to lead in that area and reap immense economic benefits.

Despite the development of the Renewables White Paper in 2003, there has been little progress in developing a predictable legal framework to

---

[14] F Farouk 'The Green Economy and Sustainable Development in Sub-Saharan Africa' in N Netzer & J Althaus (eds) *Green Economy Turning Over a New Leaf Towards Sustainable Development?* (2012) 19; see also Department of National Treasury 'Reducing Greenhouse Gas Emissions and Facilitating the Transition to a Green Economy: Carbon Tax Policy Paper' (2013) 19.

[15] Ibid, Carbon Tax Policy Paper*;* In Copenhagen at the COP 16 of the UN Framework Convention on Climate Change (UNFCCC) South Africa voluntarily undertook to reduce its GHGs emission by 34% by 2020 and by 42% by 2025, this was reconfirmed at UNFCCC, COP 17 in Durban in 2011(the net effect of this undertaken is in fact not to increase GHG emission as the country would have done in a business as usual scenario).

[16] Art 4(1) UNFCCC- explain annexes.

[17] See further analysis of these global imperatives in part 2.1.2 of this Chapter below.

specifically anchor the adoption of renewable energy technologies.[18] Legal reforms towards renewable energy seem to have been superseded by developments, both technologically, and in the social, economic, and political climate in South Africa. Since 2003, the aims and objectives of renewable energy regulation have shifted with the changes in the energy supply and demand trajectories of South Africa. The 2008 global financial and economic crisis has also affected the international availability of project finance for research and development, and funding new projects. However, the global financial crisis is seen as being partly responsible for shifting of investment to the relatively unscathed developing countries like South Africa.[19]

Electricity demand has increased by a huge margin to the extent that in 2008 rolling black outs were inevitable, and the risk persists into 2014. It is projected that energy demand in South Africa will continue to grow to the magnitude of 75,000 Megawatts (MW) by 2025.[20] This huge demand growth cannot be met from the current supply capacity and hence the fast tracking of Eskom's Build Programme and the rush to mainstream renewable sources, especially from IPPs who can supplement capacity.[21] The lack of a legal framework has partly militated against efforts to move to an energy mix substantially supported by renewable sources.[22] Partly, because in the South African regulatory environment, the country has an obligation to deliver crucial

---

[18] A particularly noticeable small step is the development by the National Energy Regulator of South Africa (NERSA) of a Renewable Energy Feed-In Tariff (REFIT) Guidelines (March 2009) <http://www.nersa.org.za/UploadedFiles/ElectricityDocuments/REFIT%20Guidelines.pdf >; and a recent Consultation Paper on Renewable Energy Feed-In Tariff – Phase 2 (July 2009) <http://www.nersa.org.za/SectionsDocuments.aspx?Section=3&Doc=15>

[19] Anton Eberhard 'South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons' (2014).

[20] IRP 2 2010–2030 (2013 update) and the Draft Integrated Energy Plan 2013.

[21] An expedited environmental impact assessment (EIA) and authorisation process has been developed for Strategic Integrated Projects through the Infrastructure Development Act 23 of 2014, which includes energy projects.

[22] The absence of an appropriate legal framework entrenches existing energy laws and policies that create market distortions through subsidising fossil-based energy, create entry barriers, and the misconception that renewable energy is not cost effective. See Lyster & Bradbrook (note 8 above) 29-30; S Calyolsen 'Tangled in the Wires: An Assessment of the Existing US Renewable Energy Legal Framework' (2006) 46 *Natural Resources Journal* 759, 764; see also AJ Bradbrook 'A Legislative Framework for Renewable Energy and Energy Conservation' (1997) 15 *J Energy & Nat Resources L* 313, 316-17; and AJ Bradbrook 'Green Power Schemes: The Need for a Legislative Base' (2002) 26 *Melbourne Univ LR* 15, 17.

social and economic goals that have often meant overlooking energy sustainability and focusing on delivering on those social and economic goals.[23] This socio-economic context makes it impracticable to propose a complete transition to renewable energy, rather a better case being for a balanced energy mix.

While the country is conscious of the causal relationship between renewable energy and its capacity to meet the social and economic objectives, it decidedly chose to rely on fossil sources to sustain the energy intensive economy. It may have been considered cheaper and faster to bring back moth balled coal plants online and to build new ones than to first fund research and development of renewables and then commercially deploy. Hence, the slow pace at which renewable energy has been promoted. However, once commercialised bringing new large coal-fired plants online takes longer than wind or solar as evidenced by the delays at Medupi. [24]

With the exception of the FITs[25] guidelines and regulations, and the recent National Energy Act 34 of 2008, there has been piecemeal legal reform of energy law with most of the new legislation having few incentives to promote renewable energy effectively. Some of the provisions purporting to promote renewable energy are ambiguous, vague and virtually aspirational instead of providing predictable, certain and specific strategies for the off-take of renewable energy.[26] The only visible action taken recently is the enactment of the Electricity Regulations on New Generation Capacity[27] and the shift to the

---

[23] Socio-economic rights and the need to reduce the number of people without access to energy.

[24] The REIPPPP programme has demonstrated that renewables have shorter lead times with many successful Window I projects coming online: T Hancock 'Two 75 MW PV Projects come on Stream in SA' *Engineering News* < http://www.engineeringnews.co.za/article/two-75-mw-pv-projects-come-on-stream-in-sa-2014-05-28 > Megan Wait 'IPP Programmes on Track – Eskom' *Engineering News* < *http://www.engineeringnews.co.za/article/ipp-programmes-on-track-eskom-2014-05-16* >.

[25] National Energy Regulator of South Africa (NERSA) of a Renewable Energy Feed-In Tariff (REFIT) Guidelines (March 2009) and a recent Consultation Paper on Renewable Energy Feed-In Tariff – Phase 2 (July 2009).

[26] The renewable energy or source diversity provisions in the National Energy Act are very general while the mandates in the ERA are discretionary.

[27] Electricity Regulations on New Generation Capacity GN R721 in GG 32378 of 5 August 2009 made in terms of the ERA.

REIPPPP[28] explored in detail in Chapter 3 and 6. However, this is happening in the context of legislation that was primarily developed to regulate conventional sources of energy.

The National Energy Act seeks to promote integrated energy planning, and 'to ensure…increased generation and consumption of renewable energies.'[29] Its approach to energy sources, however, assumes that renewable energy technologies can compete on an equal basis with established fossil-based sources. This is a misplaced assumption that has been one of the obstacles to large-scale deployment of renewable energy technologies.[30] Thus, apart from mentioning the need to increase the use of renewable energy, there are no substantive provisions in the Act on *how* that is to be achieved.

Contrary to principles in the National Energy Act of increasing production and consumption of renewable energy; the primary generator of electricity Eskom in line with the IRP 2 and the Draft Integrated Energy Plan (IEP),[31] has embarked on a sustained expansion of non-renewable sources, mainly coal and nuclear.[32] For instance, large fiscal resources have been made available for the financing or guaranteeing the expansion of fossil-based energy generation (through subsidisation). There are further plans to increase nuclear generation capacity as per the Nuclear Energy Policy 2008.[33] In total not less than three new coal-fired power plants are in the pipeline. Energy regulation has so far

---

[28] IPP Procurement Programme, 2012 GN 1074 in GG 36005 of 19 December 2012, Renewable Energy Independent Power Producer Procurement Programme <http://www.ipprenewables.co.za>.

[29] Preamble to the National Energy Act 34 of 2008.

[30] See authorities cited by IS Russell 'The Sustainability Principle in Sustainable Energy' (2008) 44 *Tulsa LR* 121; J Goldemberg 'Development and energy' in AJ Bradbrook & RL Ottinger *The Law of Energy for Sustainable Development* (2005) and Chapter 3 below for an analysis of the competitiveness argument.

[31] Department of Energy, Draft 2012 Integrated Energy Planning Report, published for consultation (June 2013).

[32] 'Green Groups Challenge Eskom Plans' *LegalBrief Environmental* 0134 (20 October 2009) 1; see also Eskom's *Status Report on Capacity Expansion Project* <http://www.eskom.co.za/live/content.php?Item_ID=9598> The expansion programme has a budget of R385 billion through to 2013, only a drop of which is for the renewable energy project, some of which has been placed on hold.

[33] Department of Minerals and Energy *Nuclear Energy Policy for the Republic of South Africa* GN 1347 of 2008 in GG 31695 of 12 December 2008 <http://www.energy.gov.za/files/policies/policy_nuclear_energy_2008.pdf > However, the IRP2, 13 notes that 'A persistent and unresolved uncertainty surrounds nuclear capital costs.'

focused on maintaining the *status quo* of promoting energy from fossil fuels in an industry dominated by a heavily subsidised monopoly.[34] It is in this context that, I argued that South Africa has been slow in its approach to renewable energy. By way of background, it must be understood that this tardy movement in South Africa is not by any means an isolated phenomenon. At the international level, there has been slow progress in creating legally binding obligations for countries to promote renewable energy. There is in fact no international legal instrument promoting renewable energy as such.

The analytical context discussed above is shaped by tensions and complementarities between energy and environmental law and related regulatory spaces such as mining, property, social and environmental justice. A particularly relevant aspect of this study is that to discuss how environmental law interfaces with energy law to perpetuate the status quo. This interaction may appear theoretical but also manifests in how environmental law implementation and enforcement, or lack thereof, influences energy choices and production. Nevertheless, how does energy law interact with environmental law?

2.1.1. The energy-environment interface

As Davies argues in relation to the usefulness of policy reforms to promote renewable energy,

> such specific policy reforms (cleaner fuels and renewable energy), as necessary as they are, do not take into account an overarching problem, a problem that may be their undoing if left unaddressed. Until the disjunction between energy and environmental law is repaired, one of the most fundamental barriers to a new and different energy future remains. Changing our course requires admitting our problem: Separating discussions of energy and environment works only to help us live the lie, to enable our addiction.[35]

---

[34] There are negligible efforts to force technology, rather the focus is on making fossil-based energy cleaner, e.g. coal gasification, natural gas as well as increased use of nuclear energy. I argue that this thrust is off-target, as it will not enable the country to meet its sustainable development and millennium development goals. In other words, alleviating energy poverty through increased use of fossil-based energy sources to the contrary exacerbates poverty in the wider sense.

[35] LL Davies 'Alternative Energy and the Energy-environment Disconnect' (2009) 46 *Idaho LR* 473, 475.

Sustainable energy requires an enabling regulatory framework to spur it forward. A perennial criticism of South African environmental law[36] is that it has been, and remains fragmented.[37] By definition, this 'fragmentation' denotes a lack of coordination and synchronisation of the legislation, institutions, and sectors that ideally should be interlinked as regulating an interconnected system such as the environment (ecosystem).[38] It can be argued, however, that integration (the converse of fragmentation) does not necessarily entail the creation of one piece of legislation or super-regulatory institutions; rather a lot depends on the regulatory tools used to promote cross-sectoral and institutional coordination for the design and implementation of environmental laws and policies.[39]

Among other structural challenges, this fragmentation is one of the causes of poor implementation, poor enforcement and lack of compliance with environmental laws.[40] For the purposes of this study, this includes non-compliance by the energy industry, for instance failure to comply with air quality

---

[36] Environmental law is used as defined broadly in Chapter 1; M Van Der Linde & E Basson 'Environment' in S Woolman & M Bishop Constitutional Law of South Africa 2nd ed (2008) list of some 28 statutes as being environmental legislation.

[37] LJ Kotzé 'Improving unsustainable environmental governance in South Africa: The case for holistic governance.' (2006) 9/1 *Potchefstroom Electronic Law Journal* 1/44 (In 2006 Kotze identified fragmented environmental governance as a serious problem and suggested that a one-stop environmental system, integrated pollution control and corporative governance could address the problem. Up to 2014 the only reform that has attempted to confront this problem is the development of a One Environmental System, which regrettably, deals only with mining and environmental authorisations.) see also J Glazewski & L du Toit (eds) *Environmental Law in South Africa* Service Issue 2 (2014) (Chapter 6 elaborating on the complexity of the environmental governance system of South Africa and the clear institutional vertical and horizontal fragmentation that remains.) Du Plessis laments the fragmentation of energy laws and failure to regulate the energy production chain, see 'Energy Laws' in Deketelaere et al (eds) *South Africa: International Encyclopaedia of Energy Laws* (2015) 189.

[38] Kotze, ibid 3-15 analyses the causes of this fragmentation as well as its typologies and manifestations extensively and that analysis shall thus not be repeated here.

[39] LJ Kotzé 'Environmental Governance' in AR Paterson, LJ Kotzé & A Sachs *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (2009) 110-112, where he identifies fragmentation at three levels namely, institutional, legislative, inter-sectoral and compliance and enforcement regime fragmentation; see also generally C Steinberg 'Can Reasonableness Protect the Poor? A Review of South Africa's Socio-Economic Rights Jurisprudence' (2006) 123 *SALJ* 14-40.

[40] Ibid, see also R Sampa & A Kordunsky 'Technical Report: Role of Regulators in Promoting Clean Energy' (2011) *AECOM International Development for USAID* 10 <http://www.satradehub.org/home/role-of-regulators-in-promoting-clean-energy/callelement>; Kotze (note 39 above) 110 especially fnote 34, aptly collates extensive research that has been done on the issue of fragmented environmental governance in South Africa.

standards and emission limits, extraction of energy resources without proper authorisations and licences.[41] The weak synergy between South Africa's relevant environmental and energy law is one of the impediments to expansion of renewable sources of energy. Undoubtedly, this is only one of the impediments because there are other impediments, non-legal in nature and thus beyond the purpose of this study.[42] Nevertheless, these other impediments are important, as correcting the legal gaps will not necessarily translate into a country powered by wind farms only. Once the regulatory framework is corrected, it could be easier and possible to address other institutional, macro-economic, and social challenges to renewable energy.

This study investigates the potential of connections between law, regulation, and policy in promoting renewable energy. In particular, I analyse the fragmentation between energy and environmental law and the regulatory effects of the resulting misalignment on the adoption of renewable energy sources.

Fragmentation, misalignment, and tension remain between energy and environmental regulation in South Africa. The energy-environment legal interface in South Africa is fragmented, segmented and structurally malfunctioning. Current debates on nuclear energy, coal, climate change, renewables, and environmental sustainability illustrates this. At a higher regulatory level, the pervasive fragmentation of environmental law also affects the regulation of the energy sector. With the intricate connection between

---

[41] *S v Anker Coal SA (Pty) Ltd CASE*: ESH 8 /119 (Mpumalanga); *S v Golfview Mining (Pty) Ltd CASE:* ESH 82/11 (Mpumalanga) (both cases concerned admission by coal mining companies of several violations and non-compliance with environmental legislation). In a 2014 case ultimately settled between some energy corporations and the Department of Environmental Affairs, the companies challenged new air quality standards that they were set to comply with in 2020 arguing that the standards could not be met in the current technological and economic environment even in 2020. See further *Sasol Synfuels (Pty) Ltd & Others v Minister of Water and Environmental Affairs & Others* (High Court, Gauteng Division, Pretoria) Case No 36444/14 (21 June 2014). See also 'Department of Environmental Affairs Receives Eskom Application for Air Quality Standards for Sixteen Power Stations' (Media Release by Department of Environmental Affairs, 11 March 2014); Sue Blaine, 'Firms "Abusing Law" on Air Quality Standards Compliance' *Business Day* (Johannesburg 3 April 2014), available at < www.bdlive.co.za/national/science/2014/04/03/firms-abusing-law-on-air-quality-standards-compliance>

[42] These include political, technical economic and social barriers to renewable energy elaborated on in Chapter 5 of this thesis.

energy and environmental law (both regulate the use of natural resources), it is not surprising that any fragmentation within and between these two broad fields of law can adversely affect regulatory outcomes. Fragmentation within environmental law – which has been extensively researched – not only impedes environmental regulation, but also the regulation of primary energy resources that are part of natural resources.[43] The consequential effect of the internal fragmentation of environmental law, as ably demonstrated by Kotze, is to externally disrupt the development of an ideal renewable energy law in South Africa. This thesis seeks to fill the gap left by analysing the implications of fragmentation on the use of renewable energy in South Africa.

Environmental standards, norms, and procedures should be developed with their regulatory impact on energy development and planning in mind. Any internal incoherence in environmental law is exported to fields of law that react to, and are reacted upon by environmental law – in this case the use of natural resources in the energy industry. The fragmentation becomes more crippling externally as the governance and lack of cooperation are felt more in inter-ministerial, inter-departmental, and inter-provincial interactions.

Currently, it is clear that in most countries energy law has grown outside environmental regulation with serious consequences.[44] This applies with full force to the South African regulatory architecture. The substantive legislation has developed separately, while the institutions have also been set up in silos that have nurtured a lack of sectoral integration in terms of implementation and planning. Until recently, the Department of Environmental Affairs and the Department of Energy did not see each other as having a common objective or mandate, namely to promote the sustainable use of natural resources.

The conjoining of the energy department and mining until 2008 made the sectoral fragmentation worse as mining is regarded as one of the serious threats to environmental sustainability. The reorganisation of the ministries

---

[43] U Outka 'Environmental Law and Fossil Fuels: Barriers to Renewable Energy' (2012) 65 *Vand. LR* 1680, 1682; see also Kotze (note 39 above) 117.

[44] AJ Wildermuth 'The Next Step: The Integration of Energy Law and Environmental Law' (2011) 31 *Utah Envtl. LR* 369, 380; JP Tomain *Ending Dirty Energy Policy: Prelude to Climate Change* (2011) 12. The proposed use of economic incentives usually managed by treasury departments adds to the institutional fragmentation: see Sampa & Kordunsky (note 40 above) 10.

since 2008 improved the situation in that Department of Mineral Resources is now a stand-alone department and increasingly moving towards creating synergies with the Departments of Water and Sanitation, and Environmental Affairs. The mining and environmental affairs departments have since agreed on amendments to their respective legislation, mining permit application and other environmental authorisations procedures. This is to ensure that the departments cooperate when considering licensable activities that may have a detrimental impact on the environment – the One Environmental System.[45] Such activities include mining for primary energy resources such as coal and uranium.

The tension between environmental and energy law is expected given the historically tangential objectives of the two fields of law. Whereas environmental law aims to promote environmental protection and conservation and to prevent pollution, energy law is aimed at facilitating growth of the country's economy by using more primary energy natural resources. Energy law is economic in nature and focus, thus naturally bringing it into conflict with environmental law, which tends towards constraining economic activities.[46] Most of the recent laws in both fields are embedded in the concept of sustainable development, as enshrined in s 24(b) of the Constitution. However, measuring sustainability in practice has proved a challenge.

The National Environmental Management Act 108 of 1998 (the NEMA) is the primary environmental statute enacted with the express objective of removing the regulatory and institutional fragmentation noted above. As overarching framework legislation, the NEMA sets the fundamental structures and principles for regulating natural resources and the effects of development

[45] The reform process that started in 2008 is now being pushed with more force, see National Environmental Management Laws Amendment Act 25 of 2014 (NEMLA 3) GN 448 in GG 37713 of 2 June 2014 (in effect 3 September 2014), and the Mineral and Petroleum Resources Development Amendment Bill B15-2013 GG 36523 of 31 May 2013 (returned to the legislature by the President recently).
[46] Davies (note 35 above) 480.

activities on the environment.[47] In the context of this study, the NEMA contains provisions, discussed in detail in Chapter 5 (4.2), that are key to sustainable development and thus renewable energy. For instance, the environmental authorisation (EIA) process has potential to promote sustainable energy sources, while gradually discouraging GHG emitting fossil sources. The process requires an application of the precautionary principle, the principle of prevention, and sustainable use of non-renewable resources[48] that can incrementally make it unattractive to deploy fossil-based power plants.

Despite its potential usefulness, the environmental authorisation process (otherwise popularly called the EIA) has often been criticised as an obstructive process for urgent and time-bound energy development projects.[49] In this respect, environmental law does not only affect renewable energy particularly, but all forms of energy. This is only one of the many ways in which environmental regulation affects energy development. Internationally, existing environmental and energy laws indirectly influence the transition to renewable energy by entrenching fossil-based energy sources.[50] Among other things, this is achieved through indirect subsidisation of fossil fuels, for instance by allowing externalisation of environmental costs.[51] Environmental law aids this process by *inadequately* regulating the energy sector by focusing on end of pipe pollution control. Thus, environmental law does not directly attempt to regulate primary inputs into the energy production process.

Before 1994, South African environmental law was out-dated. With the

---

[47] Despite these noble aims, an assessment ten years into its implementation, revealed that gaps still remain in making the NEMA principles and strategy effective, however by 2014 a jurisprudence and further legal reforms had ensured the NEMA is largely effective; see Nigel Rossouw and Keith Wiseman 'Learning from the implementation of environmental public policy instruments after the first ten years of democracy in South Africa.' (2004) 22 *Impact Assessment and Project Appraisal* 131-140.

[48] All these are among the principles of environmental management in the NEMA, s 4.

[49] F Retief & B Chabalala 'The Cost of Environmental Impact Assessment (EIA) in South Africa' (2009) 11 *Journal of Env. Assessment Policy and Management* 51-68.

[50] AJ Wildermuth 'Is Environmental Law a Barrier to Emerging Alternative Energy Sources?' (2010) 46 *Idaho LR* 509, 531.

[51] Discussed in detail in Chapter 5 (5.1) below, see J Blignaut *et al* 'The External Cost of Coal-Fired Power Generation: The Case of Kusile' (29 September 2011) 5-6. <http://www.greenpeace.org/africa/Global/africa/publications/coal/FULL%20SCIENTIFIC%20PAPER%20139%20pages.pdf> and generally RL Ottinger et al *Environmental Costs of Electricity* (1990); E Martinot et al 'Renewable Energy Futures: Targets, Scenarios and Pathways' (2007) 32 *Annual Review Environmental Resources* 205-239.

new 1996 constitutional dispensation, extensive reforms began ushering in sustainable development and other modern principles of environmental management that now underpin law and policy.[52] Admittedly, South Africa has made huge strides in promoting regulatory synergy within environmental law, especially through framework legislation and aligned sectoral legislation. However, energy development and planning should take place within an environment regulate by the modern environmental standards, norms and procedures. Any incoherence between energy and environmental law can disrupt policy implementation leading to a lack of inter-ministerial and inter-departmental cooperation.

Mining, especially coal mining, was an exemplar of this fragmentation until 2014 when the Department of Environmental Affairs and that of Mineral Resources concluded a prolonged process to come up with the One Environmental System – albeit narrowly concerned with environmental management of mining activities.[53] The One Environmental System does not pretend to address friction between energy and environmental law as such, which must be addressed to promote renewable energy as argued in this thesis. In particular, efforts to anchor the transition to sustainable energy through environmental planning and pollution control have not yet yielded good results.[54] Reform of the energy sector legal framework has focused mainly on supply-side issues – electrification, access, energy security, and reliability of supply – while ignoring demand-side and environmental sustainability aspects.[55]

---

[52] *BP Southern Africa (Pty) Ltd v MEC for Agriculture, Conservation, Environment and Land Affairs* 2004 (5) SA 124 (W) 144A–B; *Director: Mineral Development, Gauteng Region and another v Save the Vaal Environment and Others* 1999 (2) SA 709 (SCA) 719C–D.

[53] For a detailed analysis of this system, which was finalised in 2014, see TL Humby, 'One Environmental System: Aligning the Laws on the Environmental Management of Mining in South Africa' (2015) 33(2) *Journal of Energy & Natural Resources Law* 110, especially at 123 (explaining the process leading to the 2014 final legal amendments). While an encouraging achievement, in practice, this system is still new and has not had any observable impact.

[54] Renewable energy sources, while widely regarded as environmentally sustainable, are viewed with circumspection in countries that have abundant coal, the burning of which makes better economic sense (economically sustainable). Abruptly adopting renewables is seen as unsustainable as they are perceived to be still more expensive. This distorted view is fast changing with the realisation of the level of subsidies that go into fossil fuels and the externalisation of social and environmental costs.

[55] G Ruiters 'Free Basic Electricity in South Africa: A Strategy for Helping or Containing the Poor' in McDonald *Electric capitalism: Recolonising Africa on the power grid* (2009) 248, 249.

In the South African context, these are real priorities, yet they should not overshadow the long-term effects of relying on coal.

The assertion that energy and environmental regulation must be integrated is underpinned by certain legal assumptions. First, this assumes that the integration or alignment of energy and environmental laws is necessary for the transition to renewable energy. Second, that such an alignment is possible. Third, that the alignment is in the interests of sustainability. Questions that inform an understanding of these assumptions include whether or not environmental law is a barrier to an effective transition to renewable energy.[56] The argument that renewable energy law is at the confluence of environment and development is unequivocal as demonstrated by the analysis in the preceding section.[57]

The ultimate source of all the energy on Earth is the sun, which, through different and diverse biological and natural processes, produces different types of energy, directly and some indirectly; the wind blows because of the sun, and the hydrological cycle exists because of the sun. Most of our energy sources, primary or secondary, come from natural resources. Not surprisingly, there is an inevitable connection between nature, natural resources, or the environment broadly understood with the issue of sustainable energy. Most primary energy carriers, namely fossils – coal, oil, gas – and renewables are all generated through processes (the energy cycle and the food web) embedded in nature.[58] Thus, it has been concluded that:

> [t]he connection between energy and the environment has been the subject of many studies and it is sometimes possible to establish a "cause and effect" relationship between energy use and environmental damage... A more recent example is the soil degradation and desertification observed in some areas of Africa, due to the use of fuel wood as a source of energy.[59]

---

[56] Wildermuth (note 50 above) 509 (grappling at length with this question in the US context).
[57] ME Mansfield *Energy Policy: The REEL World: Cases and Materials on Resources, Energy, and Environmental Law* (2001) 378.
[58] Tomain (note 44 above) 13.
[59] J Goldemberg *Energy, Environment and Development* (1996) 1, 181.

This natural intertwinement between energy and natural resources translates into a regulatory complex where laws that govern energy impinge on laws that regulate natural resources.

The precise questions that arise include the role of environmental law in promoting or hampering the energy industry processes from generation, transmission to distribution; conversely, the role of energy law in making it easy or harder to regulate matters like climate change, air and water pollution, land-use planning and regulation, and environmental decision-making. It has often been assumed that energy policy and law are linked to environmental policy and law, but very few legal studies have been undertaken to understand the nature of the relationship between these two fields of regulation in South Africa.[60] In one study, it is argued that while environmental law and policy do not necessarily impede transition to renewable energy, it equally does nothing to incentivise that transition.[61]

While this may be true in the context of the United States of America, it is not necessarily true in the South African regulatory environment. It can be argued that environmental regulation has become an impediment to the transition to renewable energy in South Africa's energy mix. To an extent, the standards imposed, and procedural regulations such as EIA, air quality standards, waste standards, water quality objectives and biodiversity conservation initiatives all somehow constrain the speed with which renewable energy projects can be despatched. On the other hand, it can be argued that with the recent mainstreaming of sustainability in South African environmental law – the situation may be changing. If properly implemented, environmental law can provide incentives for the great transition. This study found that in South Africa, environmental law provides scope for such incentives.

Arguably, the way we regulate the environment directly affects the degree to which renewable energy is seen as a viable option relative to

---

[60] Tomain (note 44 above) 12-13 ('When we speak of energy, we are also speaking about the natural resources used in its production – energy and natural resources are inextricably linked throughout the fuel cycle from exploration to extraction to end use and disposal… Energy laws, policies and regulations, then, should not ignore the environmental effects that occur throughout the fuel cycle.').

[61] Wildermuth (note 50 above) 511.

conventional energy sources. In particular, to produce energy from renewable sources one would have to comply with a plethora of environmental and planning laws. This is not only to obtain the licence to generate energy, but to access land, and continue to operate a facility producing renewable energy. The primary focus of environmental regulation is to control pollution and energy processes are one of the main contributors to land, air and water pollution.[62] However, this could provide negative incentives to force a shift towards renewable energy. It has been argued therefore that:

> [t]oday, the world's energy supply is largely based on fossil fuels. These sources of energy will not last forever and have proven to be one of the main causes of our environmental problems. Environmental impacts of energy use are not new but they are increasingly well known. As links between energy use and global environmental problems such as climate change are widely acknowledged, reliance on renewable energy is not only possible, desirable and necessary, it is an imperative.[63]

Acknowledging that this barrage of environmental regulation is necessary to promote development that is sustainable, it is argued here that the parallel regulation of energy and the environment has certain adverse repercussions for the adoption of renewable energy technologies. In this sense environmental law and policy becomes a *structural* obstacle to renewable energy rather than a *substantive* impediment. This is where I argue that integrating energy and environmental regulation could remove the structural misalignment between these two fields and unlock renewable energy. A further unnoticed gap is the failure of environmental law to regulate energy inputs or raw materials – rather focusing mostly on controlling resulting pollution.

The disconnection between energy and environmental law and policy is historic and long established. Lincoln Davies argues that:

> such specific policy reforms (cleaner fuels and renewable energy), as necessary as they are, do not take into account an overarching problem, a problem that may be their undoing if left unaddressed. *Until the disjunction between energy and environmental law is repaired, one of the most*

---

[62] H Strydom & N King *Environmental Management in South Africa* (2009) 773 (waste products of energy process are discarded into the physical environment).
[63] European Renewable Energy Council (EREC) *Renewable Energy in Europe: Markets, Trends and Technologies* 2nd ed (2010) 3.

> *fundamental barriers to a new and different energy future remains.* Changing our course requires admitting our problem: Separating discussions of energy and environment works only to help us live the lie, to enable our addiction [to fossil fuels].[64]

Keeping energy and environmental law disjointed entrenches the established fossil fuels energy industry.[65] Despite the existence of some enabling provisions in energy laws, the relevant agencies have not forcefully harnessed those powers. This is likely due to the presence of provisions that entrench conventional sources of energy in these very laws. Existing energy law institutionally and structurally bolsters the conventional sources, while making it near impossible for renewable sources to enter the market. This entrenchment happens through various strategies, such as regulatory exemptions and exceptions, economic reification, and propagation of a sense of indispensability for fossil fuels under concepts such as base load and reliability.[66]

Creating coherence through regulatory synergy between these two fields undoubtedly enables traditional energy law to be infused with modern principles of environmental management that promote sustainability. Synergies need also be created among other fields of law that impact implementation of renewable energy programme. These include agriculture, property and land zoning laws. This chapter seeks to demonstrate the need for regulatory synergy by using energy and environmental law as illustrative fields of law. The same analysis could be done with other fields of law that influence the effectiveness of laws to promote renewable energy.

A good illustration of the entanglement between energy and natural resources issues are the current debates in South Africa relating to coal mining in environmentally sensitive areas. Of course coal is required not only to produce electricity, but also for other industrial uses, nevertheless 89% of South Africa's total energy comes from burning coal[67] and any slight disruption of the coal supply chain could result in energy supply and demand mismatch as

---

[64] Davies (note 35 above) 473, 475 *(my emphasis)*.
[65] Davies (note 35 above) 475.
[66] Tomain (note 44 above) 127.
[67] Strydom & King (note 62 above) 766.

witnessed in 2008. Specifically, of this total energy consumption, 93% of electric energy comes from burning coal.[68] The rate at which coal is mined and processed is directly influenced by the process and cost of obtaining a coal mining licence, complying with water, air, and environmental laws in the mining process, and the transportation of coal.

Recently Coal of Africa Limited had to be directed to cease preliminary operations at Vele Coal mine in Limpopo because it was clearing virgin vegetation and constructing access roads, producing dust and using water – all this without the licences or authorisation required under the National Water Act, the Air Quality Act, and the NEMA.[69] Yet they had complied with the mining laws administered by the Department of Mineral Resources, which led them to obtaining a mining licence. The Minister of Environmental Affairs was even quoted by newspapers as having been against mining in that sensitive area.[70] While there is open disagreement between government departments, some environmental activists were outraged at the mining company and the Department of Mineral Resources and another group of activists supported the mining of coal in Limpopo given the potential economic benefits from the mine. Yet another group was concerned because of the potential impacts on the Mapungubwe Ruins heritage resources close by.

Similarly, in Mpumalanga, many commercial farmers are outraged at mining companies presenting prospecting and mining licenses issued in respect of their farms, some without their knowledge or participation, and some with some knowledge but still over their objections. What do we value more, agriculture (food security) or mining (coal-electricity)? Should we put Eskom at risk of not having enough feedstock for electricity while securing agriculture and food security? Is it a matter of 'either/or' or 'both/and'? Outraged activists also recently went to the extent of handcuffing themselves to construction cranes at

---

[68] Ibid 768-769, this means that the majority of South African coal is produced for the electric energy sector.

[69] E Swanepoel 'CoAL's Vele Project Raises Environmental Concerns' *Mining Weekly* (20 February 2009) <http://www.miningweekly.com/article/coals-vele-project-raises-environmental-concerns-2009-02-20>

[70] Ibid; Van Schalkwyk as he then was commented 'The associated infrastructure like roads, waste dumps, power lines, and electricity generation facilities in this specific area is also undesirable.'

the site of Eskom's new Kusile coal-fired power station.[71] A number of environmental laws have been promulgated since 1998 to address these contradictions and conflicts in how we are using our natural resources (both land and the minerals beneath). In the meantime, energy regulation has been focused on energy security[72] and promoting access to affordable energy in an out-dated fossil-entrenching framework. Indecisiveness on whether to mine coal or promote agriculture, save water, preserve heritage and biodiversity; vacillations from gas, nuclear, renewables, a tax on carbon, FITs or auctions; and the climatic sequel of interdepartmental court actions are the unquestionable hallmarks of fragmentation and lack of cooperation. However, the agitation for renewable energy and shift away from fossil fuels assumes that there are sufficient and viable renewable sources available to South Africa. This is not necessarily the case when one considers the total energy demand and the ability of renewable energy to sustain heavy industrial activities.

2.1.2. The international landscape for energy industry regulation

The domestic fragmentation in energy law, while reflecting the international situation,[73] flies past recent attempts internationally to link sustainable development to the availability of sustainable, reliable, safe and secure energy sources.[74] United Nations (UN) agencies whose activities implicate energy resources all agree that sustainable energy is a *sine qua non* for poverty alleviation, sustainable development, and economic growth.[75] Invariably

---

[71] M Davies 'We Don't Need Kusile Power Plant in South Africa: Here's Why...' <http://www.greenpeace.org/africa/en/News/Blog/we-dont-need-kusile-power-plant-in-south-afri/blog/37646 >; see also *S v Anker Coal SA (Pty) Ltd* Case: ESH 8/119 (Mpumalanga); *S v Golfview Mining (Pty) Ltd* Case: ESH 82/11 (Mpumalanga).

[72] B Barton 'Energy Security in the Twenty-First Century' in B Barton et al *Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (2004) 457,459 (defining energy security).

[73] R Leal-Arcas, A Filis and EAS Gosh, *International Energy Governance: Selected Legal Issues* (Edward Elgar 2014) 19, noting that global energy governance is currently 'fragmented and multi-layered'.

[74] UNGA 6th Session Resolution on 'Promotion of New and Renewable Sources of Energy, Including the Implementation of the World Solar Programme' Resolution *A/RES/60/199* (13 March 2006).

[75] C Flavin & M Hull Aeck 'The Potential Role of Renewable Energy in Meeting the Millennium Development Goals' REN21 Network, The World Watch Institute (2005) 9 and 12.

international policy documents link sustainability to access to affordable energy.[76] A key running theme of the UN Commission on Sustainable Development (CSD) is to understand the role of energy in promoting sustainability and Agenda 21 goals, especially in developing countries. This theme was recently expanded to include the new strategy of 'green economy' or 'green growth'.[77] Green economy was one of the two themes of the Rio+20 CSD Conference in 2012. Green economy, while an old concept, is being rejuvenated as an alternative pathway to development that sees economic growth as essential for sustainable development.[78] It elevates the economic pillar of sustainable development in a way that capitalism is not seen as the predominant problem facing sustainability globally, thereby catapulting sustainable development to the service of capital.[79] Arguably, we are nearing the total displacement of green radicalism[80] by the neo-liberal approach to sustainability, a process that started long ago to protect the status including reliance on fossil fuels.

Certainly, to the extent, that green economy is an exhortation to move towards a low-carbon economy, it serves a useful purpose for the transition to renewable energy. Nevertheless, as a strategy out of the failures of capitalism and neoliberalism, the green economy concept is problematic as it is still premised on the unsustainable economic growth model based on more extraction of natural resources.[81] More cheap energy resources will be needed to sustain economic growth and that means increased use fossil energy.

---

[76] United Nations Conference on New and Renewable Sources of Energy in Nairobi A/RES/36/193 (17 December 1981).
[77] UNCSD Outcome Document *The Future We Want* A/RES/66/288.
[78] E Rehbinder 'Contribution to the Development of Environmental law' (2012) 42 *Environmental Policy and Law* 210, 211.
[79] S Cook & K Smith 'Introduction: Green Economy and Sustainable Development: Bringing Back the "Social"' (2012) 55:1 *Development* 6; S Banerjee 'Who Sustains Whose Development? Sustainable Development and the Reinvention of Nature' (2003) 24 *Organization Studies* 143, 156; S Böhm, MC Misoczky & S Moog 'Greening Capitalism? A Marxist Critique of Carbon Markets' (2012) 33 *Organization Studies* 1617, 1618.
[80] JS Dryzek 'Paradigms and Discourses' in D Bodansky, J Brunnee & E Hey *The Oxford Handbook of International Environmental Law* (2007) 58.
[81] U Brand 'Green Economy the Next Oxymoron? No Lessons Learned from Failures of Implementing Sustainable Development' (2012) *GAIA-Ecological Perspectives for Science and Society* 28.

The international recognition of the connection between energy and sustainable development shows that conventional sources of energy are part of the problem,[82] and there is need to transition to renewable sustainable energy.[83] Similarly, this trend with global institutions links energy to the achievement of the Millennium Development Goals (MDGs)[84] through a low-carbon economy. Although access to energy is not one of the goals, it is acknowledged that availability of energy is essential for the achievement of many of the MDGs and sustainable development.[85] Relevant for the purposes of this study is that there is a direct link between Goal 7 on environmental sustainability and the desirability of sustainable energy that is less polluting.

The MDGs (Sustainable Development Goals-SDGs since September 2015) on poverty alleviation, education, health and HIV all require access to energy to be fully realised.[86] This recognition is important as an imperative for integrating energy and environmental regulation for sustainability at the national level. The continued separation of energy and environmental law is an obstacle to South Africa achieving its sustainable development goals.[87] An energy policy entrenched on unsustainable conventional sources of energy is a big obstacle to global and national developmental objectives particularly if the country intends to promote sustainability. The perspectives of UN global institutions also highlight the disconnection between energy and sustainable development as a

---

[82] R Schubert, J Blasch & K Hoffmann 'Environmental Protection, Energy Policy and Poverty Reduction- Synergies of an Integrated Approach' (2007) *Energy Policy and Poverty Reduction - Synergies of an Integrated Approach. IED Working Paper* 1 (2009) 4-5.

[83] Report on 'Energy for Sustainable Development', African Regional Implementation Review for the 14th Session of the Commission on Sustainable Development (CSD-14), prepared by the Economic Commission for Africa (UNECA) on behalf of the Joint Secretariat UNECA, UNEP, UNIDO, UNDP, ADB and NEPAD Secretariat, 6.

[84] Flavin & Hull (note 75 above) 9 and 12.

[85] UN Energy *The Energy Challenge for Achieving the Millennium Development Goals* (2005) *New York* 6-7; Secretary-General's Advisory Group on Energy and Climate Change (AGECC) (2010); Johannesburg Plan of Implementation (2002).

[86] UN Energy (note 85 above) 18; MDGs were superseded by the Sustainable Development Goals (SDGs), Transforming our world: the 2030 Agenda for Sustainable Development, in September 2015. Goal 7 is now a goal to 'Ensure access to affordable, reliable, sustainable and modern energy for all'.

[87] See Department of Environmental Affairs and Tourism, Government of South Africa 'Country Report to the 14th Session of the UNCSD' (September 2005).

regulatory problem that could be alleviated by regulatory interventions, hence the focus of this study.[88]

Most of the legally binding efforts have been concentrated at the regional and sub-regional levels such as the European Union (EU) directives on renewable energy and the Energy Charter Treaty, but that is about it. Organisations have also been formed such as the International Renewable Energy Agency (IRENA)[89] to promote renewable energy, but without an agreed international legal treaty. In some regions, for instance the Southern African Development Community (SADC), there are regional electricity trading intergovernmental bodies such as the Southern Africa Power Pool (SAPP).[90] There has been too much talk with less legislative and policy action to implement sustainable and renewable energy. This has filtered down from the UN level, where there has been extensive introspection and planning on how promoting renewable energy advances sustainable.[91] However, little has been done at that level to obtain committed legally binding undertakings from states.

This bleak picture should not overshadow efforts towards developing norms and standards that ultimately could lead to such an international framework or a culture of using energy sustainably and from renewable

---

[88] UN Energy (note 85 above) 9; Report on 'Energy for Sustainable Development' (note 83 above) 18.

[89] International Renewable Energy Agency (IRENA) <www.irena.org> IRENA is an intergovernmental organization aimed at promoting renewable energy technologies. It was established following the 1981 United Nations Conference on New and Renewable Sources of Energy in Nairobi, see Art II of the A/RES/36/193 of 17 December 1981 and A/RES/37/250 of 21 December 1982 on the Immediate implementation of the Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy.

[90] Southern Africa Power Pool (SAPP) < http://www.sapp.co.zw >.

[91] Developed and adopted at the Millennium Development Conference in 2000, through the United Nations Millennium Declaration <http://www.un.org/millennium/declaration/ares552e.htm >; J Ocampo 'The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective-Summary of Background Papers' Paper presented at the United Nations Report by a Panel of Experts to Second Preparatory Committee Meeting for United Nations Conference on Sustainable Development (UNCSD) 2011.

sources.[92] Non-governmental and intergovernmental actors have led the efforts so far. The point remains that there are attempts to create movement towards the development of standards, legal and policy principles to guide the development of a legal framework for renewable energy at the international or regional level. Other international legal instruments that indirectly regulate matters relevant to renewable or sustainable energy are also important.[93] These indirect instruments are useful in raising international support for international norms and standards for renewable energy generally and in the electricity industry. Similarly, there are also national efforts towards regulating for renewable energy in a number of jurisdictions.[94] Over time, these domestic endeavours may change into widespread state practice that may lead to the development of a global consensus on the need to promote renewable energy.

A particular constraint caused by the lack of decisive international and regional energy regulatory frameworks; especially with regard to shared sources of energy, is the absence of transnational regulatory frameworks.[95] The development of transnational hydropower projects for instance, the SADC regional plans to build a hydropower plant (Inga) on the River Congo to supply some Southern African states requires a coordinated transnational regulatory

---

[92] International Renewable Energy Agency (IRENA) 'Roundtable for Sustainable Biofuels (RSB)' <http://cgse.epfl.ch/page79935.html> is developing international standards on biofuels; The World Energy Council <http://www.worldenergy.org> is spearheading research and development on energy issues internationally; to date the noticeable international regulatory efforts are the Energy Charter Treaty (ECT) and the Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA) signed in 1994 in Lisbon (in force 1998), only five African states are observers and members are mostly European states <http://www.encharter.org/fileadmin/user_upload/document/EN.pdf >

[93] See generally Omorogbe (note 6 above) and the work of the IPCC on Renewable Energy evidenced by O Edenhofer 'The IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation' (2011) < http://srren.ipcc-wg3.de/report >.

[94] The following countries have developed specific legal frameworks aimed at promoting renewable energy and/or energy efficiency. These are India, China, EU, Germany (Renewable Energy Sources Act and the Energy Conservation Act), Botswana, Ghana, the whole of the Scandinavian region (Norway, Sweden, Finland, Denmark etc.).

[95] At the SADC level, there is a Protocol on Energy <http://www.sadc.int/index/browse/page/147> and the World Energy Charter is a regional treaty for European states and not necessarily a global treaty, contrast L Du Toit 'Promoting renewable energy in South Africa Through the Inclusion of Market-based Instruments in South Africa's Legal and Policy Framework with Particular Reference to the Feed-in Tariff.' Thesis presented for the degree of PhD at the University of Cape Town (2014) 41-42 seemingly arguing that South Africa could ratify this treaty).

approach and regional integration.[96] Similarly, investment and funding for renewable energy projects is dependent on the existence of a legal environment that can protect such investments at the national, regional, and international level. The absence of such guarantees limits the flow of investments into renewable technology development and deployment.[97]

2.1.3. Sources of energy in South Africa and domestic challenges

The incremental reforms to the energy laws can partly be explained by the abundance of coal for the many coal-fired power plants that South Africa currently relies on. South Africa has immense reserves of coal and it is planned that up until 2030 coal will play a central role in providing energy needs.[98]

Admittedly, the coal industry provides thousands of jobs, as coal is not only mined for local energy needs, but also for export and other purposes.[99] A whole industry has grown around the coal value chain from mining, processing, distribution, marketing, secondary industries and sales. In fact, a system of government has developed around fossil fuels over centuries.[100] The government, through state-owned enterprises, has stakes in this industry, inasmuch as Eskom and other coal-mining corporations also have deep-seated stakes in the survival of this industry. Yet, Eskom and the Department of Energy are at the forefront of shaping the country's renewable energy policy and plans.[101] Can these actors with such stakes rise above their economic interests? Mitchell cautions that in the coal and oil industry fear of competition is

---

[96] T Creamer 'SADC reaffirms Inga as a regional project, Westcor may be expanded' *Engineering News* (11 September 2009).

[97] This is worsened in the case of South Africa by the proposed national regulation of bilateral investment relationships through the Promotion and Protection of Investment Bill 2013, GN 1087 in GG 36995 of 1 November 2013.

[98] IRP 2 (2013 update), Draft Integrated Energy Plan for Electricity 2013.

[99] J Johannessen 'Climate Change, Poverty and Climate Justice in South African media: The case of COP 17' (2013) 29 *SAJHR* 32, 34; Coal exports are the third foreign currency earner in South Africa. It is doubted whether the renewable energy industry can create enough jobs to displace jobs created by the coal mining industry.

[100] T Mitchell 'Carbon Democracy' (2009) 38 *Economy & Society* 401.

[101] Eskom is central to the success of the REIPPPP programme as it is the guarantor that the renewable electricity produced by IPPs will be bought at the bid prices. The hopes of the Independent Systems Operator coming to life soon are fading by the day.

endemic.[102] Nevertheless, there is increasing pressure for South Africa to move to renewable sources and a low carbon economy.

Broken down by the amount of power-generated, coal is the main primary source of electricity in South Africa accounting for 96% of primary generation resource.[103] The remaining 4% comes from hydropower, gas, and cogeneration.[104] Renewable energy sources are prominent by the insignificant percentage of the installed generation capacity. Even in the 20-year IRP 2, renewable energy will only supply about 18,800 MW to the country's generation capacity while additional coal during the same period will be over 16,465 MW.[105] These forecasts are a clear indication that while renewable energy is beginning to feature in the energy plans of the country; it is still an insignificant source in the energy mix given that the total energy needs of the country are estimated to require an additional 52,248 MW in the next 20 years.[106]

Importantly, this planned role of renewable energy is being undertaken in a legislative vacuum in the sense that there is not yet a dedicated renewable energy law apart from the Renewables White Paper and pragmatic amendments in electricity laws. The result is that while this planning is good there appears to be no legal obligation on the department to stick to the plan especially with respect to renewable energy sources. The ERA requires the IRP but, when push comes to shove, the department can always change the plan and revise it to increase the share of non-renewables in the generation capacity. This is more so given that IRP 2 in 2010 forewarned of rolling load

---

[102] T Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (2011) 49.
[103] M Edkins, A Marquard & H Winkler 'South Africa's Renewable Energy Policy Roadmaps.' Report for the United Nations Environment Programme Research Project, Enhancing Information for renewable energy technology deployment in Brazil, China and South Africa, Cape Town, South Africa (2010) 1.
[104] Ibid.
[105] Department of Energy (South Africa) *Integrated Resource Plan for Electricity 2010 Revision 2* (8 October 2010). Developed in terms of s 35(4) of the Electricity Act 4 of 2006 Regulation on New Generation Capacity 2009 GN R721 in GG 32378 of 5 August 2009.
[106] IRP 2, 2010.

shedding between 2011 through to 2016.[107] The IRP 2 is the key integrated energy resource-planning tool in South Africa. It is mandated in terms of the ERA and supported by the Integrated Energy Plan (IEP) in terms of the National Energy Act.[108] The current IRP 2 plan, updated in November 2013, is analysed further in Chapter 6.

While hydro sources could play a role in South Africa, the whole Southern African region is water scarce region and using hydropower could have detrimental impacts on the environment, livelihoods and food security. However, this does not prevent the use of (off-grid) small-scale distributed generation from hydro, especially for remote areas that the grid may never reach in the near future. Some grant scale hydro projects are still possible at the regional scale such as the planned Inga II in the Congo River, which is estimated to have the capacity to supply the whole of Southern Africa with enough electricity.[109]

In terms of renewable sources, the most viable in South Africa are solar and wind. There have been numerous mapping studies that have indicated the availability and feasibility of the new renewables.[110] The extent to which these have since been developed since 2010 is demonstrated by the uptake under the REIPPPP programme and further discussion of the state of these sources will be undertaken in Chapter 6. The global energy demand situation in 2013 is presented by the World Energy Council in Figure 1 below. The World Energy Council projected the continued dominance of fossil fuels, but importantly also

---

[107] Department of Energy 'Medium Term Risk Mitigation Plan (MTRM) for Electricity in South Africa 2010 to 2016 - Keeping Lights on' produced by the MTRM Project Team as an Integral Part of the Draft IRP 2 (2010) 1 ('South African electricity supply/demand situation is very tight. The latest forecasts indicate a worsening situation starting in 2011 and proceeding through to 2016. This situation poses a real risk of rolling blackouts, similar to those experienced in 2008, and a serious threat to government's objectives for growth and job creation').

[108] Section 6 (not yet in force) of the National Energy Act 34 of 2008; A Draft Integrated Energy Plan Report was published for consultation in June 2013 but never finalised GN 513 in GG 36690 of 24 July 2013.

[109] The Inga has a possible capacity of 12,629 MW and could be added by 2030, see A Miketa & B Merven 'Southern African Power Pool: Planning and Prospects for Renewable Energy' (2013) 37 <https://www.irena.org/DocumentDownloads/Publications/SAPP.pdf>. The SADC Protocol on Energy can provide a starting point to enable this regional project.

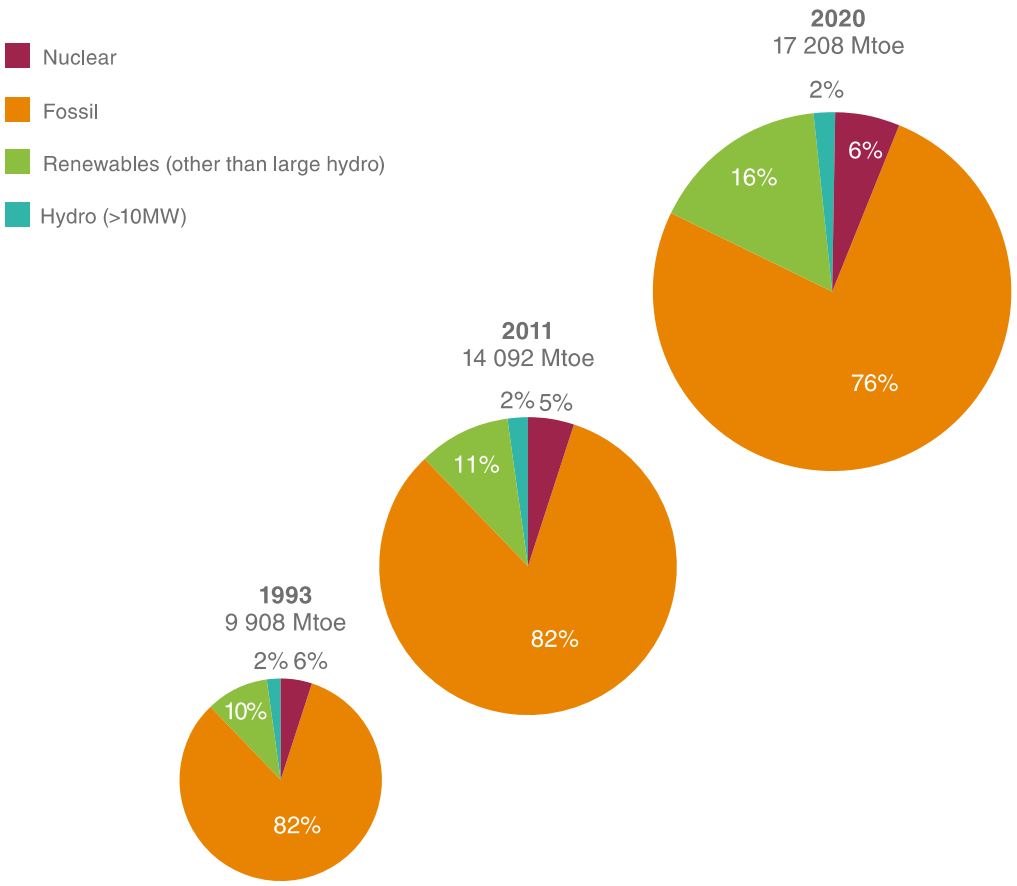
[110] M Edkins, A Marquard & H Winkler 'South Africa's Renewable Energy Policy Roadmaps.' (2010) 2-6 (detailing the cost and feasibility potential of various solar energy applications and wind in South Africa); see also SolarGIS Solar Map of South Africa < http://energy.org.za/news/158-new-solar-resource-maps-for-south-africa >.

project an increase in the share and growth of renewable energy from 1993 to 2020 of over 6 per cent:

Figure 1 Adapted from 'World Energy Resources: A Summary World Energy Council 2013' p8

Total Primary Energy Supply by resource 1993, 2011 and 2013

Source: WEC Survey of Energy Resources 1995, World Energy Resources 2013 and WEC World Energy Scenarios to 2050



'The supply and use of energy have powerful economic, social and environmental impacts. Not all energy is supplied on a commercial basis. Fuels, such as fuelwood or traditional biomass are largely non-commercial. Fuelwood is playing a leading role in the developing countries, where it is widely used for heating and cooking.'

'Universal access to commercial energy still remains a target for the future. In many countries, especially in Africa and Asia, the pace of electrification lags far behind the growing demand. It is imperative to address this major challenge without further delays, in particular taking into account the impact access to electricity has on peoples' lives and well-being, economic growth and social development, including the provision of basic social services, such as health and education.'

2.2. Why regulate the renewable energy sector in South Africa?

Academics and researchers have long pondered about the justifications for regulation and traced the concept back to the origins of the state and its regulatory agencies,[111] as well as the development of the corporate private interests and the public interest that necessitated regulation. Whether law is subsumed under regulation or whether regulation itself is a form of 'law in action' remains unclear and the relationship between these two remains a controversy. What is clear, however, is that regulation can be effected through law but there are other instruments of regulation that do not necessarily fit into the law typology.[112] This versatility of 'regulation' thus requires 'a trans-or multi-disciplinary perspective.'[113] A contemporary broad attack on regulation is that (over)regulation is increasingly seen as an obstacle to economic growth and competitiveness.[114] On the other end of the spectrum, regulation is seen as necessary to correct the excesses of modern capitalist profit seeking behaviour.

The conceptualisation of law itself is contested and the contestation has spread to a discourse that tries to unpack the relationship between law and regulation. In this respect Black rightly points out that 'the exact relationship [between law and regulation], to state the obvious, depends on the conceptualisation of both that is adopted. There is as little and as much agreement as to what "law" is as there is as to what "regulation" is.'[115]

An exhaustive analysis of the various theories of regulation is not in the purview of this study; however, in the study of regulation, law has not featured

---

[111] L McDaid 'Renewable Energy Independent Power Producer Procurement Programme Review 2014' Electricity Governance Initiative South Africa, Supported by World Resources Institute (2014) *Electricity Governance Initiative South Africa–REIPPPP review* 3 (2014) 165,166.

[112] R Brownsword *Rights, Regulation, and the Technological Revolution* (2008) 6 ('The relationship between law and regulation is unclear. Is law to be understood as a broader enterprise than regulation, or is it narrower?')

[113] R Baldwin, M Cave & M Lodge 'Introduction: Regulation-The Field and the Developing Agenda' in R Baldwin, M Cave & M Lodge *Understanding Regulation: Theory, Strategy, and Practice* (2011) 6.

[114] Ibid 7, (e.g. World Bank's Doing Business - Regulation is necessary for oversight especially of monopolies).

[115] Ibid 22; see also B Barton 'The Theoretical Context of Regulation' in B Barton et al (eds) *Regulating Energy and Natural Resources* (2006) 11-13.

very highly.[116] Hence, Morgan and Yeung conclude that, 'existing literature on theories of regulation is largely inattentive to the role of law' and this has led to an underestimation of the 'facilitative role of law' in theories of regulation.[117] This insight captures the underlying thesis argument of this study. However, as Hutter concludes, as far as the regulatory authority is concerned and, '[t]aking all of this together it is perhaps not surprising that most regulatory commentators argue for a regulatory mix – embracing both state and non-state sources of regulation – to maximise the potentials of each sector.'[118] This rise of 'regulatory pluralism'[119] should be taken with caution given its implications for accountability of regulatory institutions/actors.[120]

It has been argued, however, that 'emphasis on the law's facilitative role in regulation may point to a possible limitation of economic conceptions of regulation, which do not explicitly incorporate values other than those concerned with achieving allocative efficiency.'[121] For too long, policy formulation and regulation in the public utilities has been informed by economic theories, with negligible attention to legal realities and the role of law in regulation. Economic rationality in the energy market must be tampered by public interest and environmental justice driven legal prescriptions to guide energy choices and conduct.

Law as a guide to social and economic behaviour must ride on other non-legal methods of persuading regulated entities and individuals to see value in changing how they make choices in relation to energy and the environment.

---

[116] The concept of 'regulation' is explained in Chapter 1. For further detailed reading on regulation see generally, GJ Stigler & C Friedland 'What Can Regulators Regulate? The Case of Electricity' (1962) 5 *Journal of Law and Economics* 1; R Posner 'Theories of Economic Regulation' (1974) 5 *Bell Journal of Economics and Management Science* 335, R Baldwin, C Scott & C Hood *A Reader on Regulation*, Oxford Readings in Socio-Legal Studies (1998), A Ogus, 'Regulatory Law: Some Lessons from the Past' (1992) 12 *Legal Studies* 1; M Feintuck *The Public Interest in Regulation* (2004), I Ayres & J Braithwaite *Responsive Regulation: Transcending the Deregulation Debate* (1992), E Dal Bó 'Regulatory Capture: A Review' (2006) 22 *Oxford Review of Economic Policy* 203-225; S Peltzman 'Toward a More General Theory of Regulation' (1976) *Journal of Law & Economics*, 211-240.

[117] B Morgan & K Yeung *An Introduction to Law and Regulation: Text and Materials* (2007) 16.

[118] BM Hutter *The Role of Non-State Actors in Regulation* (2006) 14.

[119] P Grabosky 'Beyond Responsive Regulation: The Expanding Role of Non-State Actors in the Regulatory Process' (2013) 7 *Regulation & Governance* 115.

[120] Ibid 119.

[121] Morgan & Yeung (note 117 above)

Some theories of regulation support the use of law in regulation to change social and economic behaviour. The purpose of this second part of Chapter 2 is to explore the possible reasons why it is necessary to adopt legal regulation to promote renewable energy. Generally, there are various reasons why we regulate anything, and authorities have exhaustively discussed the main arguments why it is necessary to use regulation.[122] There has been little research and writing on why we regulate the energy sector specifically and in South Africa. Ultimately, the intention is to frame the proposed regulation to promote renewable energy within an appropriate frame. The general justifications for regulation do apply to the regulation of the energy sector,[123] but yet interestingly there are also peculiar reasons why regulation has become necessary to promote renewable energy.

I start by looking at the global drivers towards renewables and then proceed to look at the local drivers for renewable energy for regulation.

2.2.1. Justification and imperatives in existing laws

One of the obvious domestic drivers of renewable energy is the recent National Energy Act that explicitly provide for diversification of energy sources in South Africa.[124] The National Energy Act explicitly calls for measures to promote sustainable development/energy and to promote the diversification of sources.[125] This imperative is a direct reference to diversification into alternative sources as already the country relies heavily on fossil fuels and remains energy insecure. The enactment of the National Energy Act is therefore in itself a reason why the country should begin to look at those diverse sources and to assess whether the current plans and policies do in fact promote the sustainable development object of the Act.

---

[122] Baldwin, Cave & Lodge (note 113 above) 16 *et seq*.
[123] To rectify market failures, to eliminate externalities, to provide public services and promote competition.
[124] Section 2 National Energy Act, s 2 ERA.
[125] Section 2 objects clause National Energy Act.

Similarly, s 2(e) of the ERA provides, among other things, that the legislative objects are to 'promote the use of diverse energy sources and energy efficiency.' A 2011 Draft Bill proposed to amend the ERA to expressly add that this object would be to promote the use of 'diverse sources of energy, *renewable energy sources*, and energy efficiency' but the Bill has remained a draft to date.[126] The diversification of sources is further bolstered by s 34 of the ERA, which mandated the Minister of Energy to look at ways to increase capacity by making new generation capacity regulations. The introduction of this section is an indicator that South Africa recognises the urgency of the need to increase capacity.

Nevertheless, s 34 is not solely aimed at new capacity being renewables and its focus is simply to enable the Minister to intervene and direct plans when faced with capacity constraints. Thus, the Minister may make a determination that new generation capacity is needed and is to be secured from coal, gas, nuclear, or renewables.[127]

A further downside to s 34 is a proposed s 13A read with s 14A in terms of which NERSA's power to issue a generation licence is subjected to Ministerial consent and the overriding power of the Minister to decide if any new generation capacity will not result in excess supply. In other words, the Minister can control who enters the electricity generation sector and using what sources. Effectively, this implies that the REIPPPP and any IPP procurement programme are partly aimed at supplementing supply gaps left by Eskom's aged coal fleet, although incidentally they do open the private sector's entry into the sector. The supplementary nature of the REIPPPP could be gleaned from the unnecessary limits on the capacity allocated to IPPs in each procurement phase. This defies the logic, if the primary intention is to increase the contribution of renewables in South Africa's energy mix.

---

[126] Electricity Regulation Amendment Bill 2011.

[127] Hence the 2013-2014 REIPPPP for renewables, and plans for additional 9,6GW of nuclear envisaged under the Policy-Adjusted Integrated Resource Plan for Electricity (IRP 2) with first IPP procurement for coal set for 2015 to balance the energy mix.

a) Global environmental and energy challenges as drivers

Humans have since the late 1980s been aware of the anthropogenic impact of industrialisation on weather and climate patterns, and any action taken to date to address these impacts has been inconsequential unless backed by legally enforceable measures.[128] Internationally, the earliest of these measures include the Vienna Convention of Substances that Deplete the Ozone Layer and the accompanying Montreal Protocol. These instruments have seen a substantial reduction in the use of substances that deplete the ozone layer.[129] Experience from the Ozone regime shows that similar action could be taken in relation to climate change and the emission of GHGs, but must be properly designed.[130]

For South Africa, failure to take adequate action to reduce GHGs emission from the energy sector by using more renewables could mean various direct and indirect consequences. Looking ahead, it is likely that South Africa's trading partners especially those in Europe may ultimately introduce some green energy profile or carbon footprint into their trade agreements. This could include requirements that products imported into other countries must disclose their energy or carbon footprint through border carbon tax adjustments.[131] The result is that countries whose exports have a higher energy or carbon footprint would be at a competitive disadvantage regardless of whether they are an UNFCCC Annex I country or not.[132] Future global competition in trade, in

---

[128] The system developed within the framework of the UNFCCC and Kyoto Protocol have achieved minimal impact as member states slowly are moving away from legal undertakings to political promises I the last three Conferences of the Parties (COPs), see S Rayner 'How to Eat an Elephant: A Bottom-up Approach to Climate Policy.' (2010)10 *Climate Policy* 615, 616.

[129] Regulations Regarding the Phasing-out and Management of Ozone Depleting Substances GN 351 in GG 37621 of 8 May 2014 (made under s 53*(a)* and *(e)*, read with ss 55(1)*(a)* and 55(2) of the National Environmental Management: Air Quality Act 39 of 2004).

[130] S Rayner (note 128 above) 616.

[131] Department of National Treasury 'Reducing Greenhouse Gas Emissions and Facilitating the Transition to a Green Economy: Carbon Tax Policy Paper' (2013) 58-59; see generally S Bolwig & P Gibbon *Emerging Product Carbon Footprint Standards and Schemes and Their Possible Trade Impacts* (2009) 9; P Brenton, GE Jones & MF Jensen 'Carbon Labelling and Low Income Country Exports: A Review of the Development Issues' (2009) 27 *Development Policy Review* 243, 246. Border carbon tax adjustments are import taxes imported to off-set the relative benefit the exporting country obtained by producing the product without carbon constraints such as climate change targets or carbon taxes.

[132] D de Jongh, D Ghoorah & A Makina 'South African Renewable Energy Investment Barriers: An Investor Perspective' (2014) 25 *JESA* 15-27.

addition to the climate change pressures, requires that South Africa begins its sustainable energy initiatives now than later.[133] Despite this, caution must always be exercised to ensure that developing countries do not reform their energy systems and economies simply to accommodate pressures from developed countries. As Braithwaite and Parker argue:

> [i]ntellectual property lawyers head south and east with Western intellectual property statutes tucked in their suitcases, tax lawyers with Western tax codes in theirs. Some of this missionary work is motivated by a desire to spread justice ideals, but mostly it is explicitly funded to help developing countries regulate their societies in ways that will promote economic growth, either for themselves, or for the developed economies that are 'helping' them.[134]

There is no philanthropy in the global trade system and in promoting renewable energy; developing countries should protect their peoples' social, economic and environmental rights. Any adoption of renewable energy technologies must be informed by local and regional contexts and be sustainable in the local context.

At a regional level, renewable energy is likely to give the leading countries a huge economic competitive advantage as they lead research and technological development and commercialisation in this new sector. South Africa by taking action now to promote renewable energy would be preparing for her future domination of this sector in the Southern Africa region and possibly the whole of Africa. Countries that take the first steps have the potential to benefit most when these technologies become fully commercialised and competitive on the regional and global energy markets.

Regardless of the local priorities, there are many reasons why, globally, it has become necessary to transition towards more renewable energy in countries' energy mixes. These reasons are also the drivers for the increasing call for global regulation of the energy sector. Currently, the main global imperatives for renewable energy are the challenges coming from climate

---

[133] Lesage, van de Graaf & Westphal *Global Energy Governance in a Multipolar World* 4; ('Today, states willing to unilaterally conduct progressive energy policies face strong economic constraints, because in a context of globalization their national competitiveness is said to be undermined if they are too ambitious on an individual basis')

[134] J Braithwaite & C Parker 'Conclusion' in C Scott, N Lacey & J Braithwaite (eds) *Regulating Law* (2004) 269-270; see also M Venables 'Fit for Purpose? Feed in Tariffs Come under Scrutiny' (2011) 6 *Engineering & Technology* 18-19.

change,[135] access to affordable energy, security of supply and the need for alternative sustainable sources of energy.[136] The UNFCCC is the main treaty in terms of which countries have undertaken to reduce GHGs emission to tolerable levels that may enable us to move towards low carbon technologies and sustainable energy. While South Africa neither is not an Annex 1 country – not required to reduce GHGs as such, the country like other state parties does have minimum obligations in terms of the UNFCCC.[137] The country also committed to voluntary targets in Copenhagen.[138] How is the UNFCCC (climate change) a driver for regulating to promote renewable energy? The international climate change regime and its objectives are a reason why South Africa should be putting in place legal measures to direct the energy sector, among other sectors, towards low-carbon energy sources.[139]

The global shift towards sustainability referred to in detail in Chapter 1 implies that even in the energy sector countries have to transition to low carbon economies powered by sustainable energy sources. The MDGs may not be achievable in the time frames forecasted using conventional sources of energy as these are the cause of some of the target problems such as health challenges, environmental sustainability, education, motility rates.

The reduction of GHGs from the energy sector requires each country to take steps towards renewable energy, demand side management, and energy efficiency. A big question on climate change and sustainability convergence is how to ensure that the transition to low carbon energy sources in fact represents a sustainable energy option in the context of each country. Will South Africa be better off meeting climate change targets and objectives by

---

[135] J Krupa & S Burch 'A New Energy Future for South Africa: The Political Ecology of South African Renewable Energy' (2011) 39 *Energy Policy* 6254, 6255.
[136] O Edenhofer 'The IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation' (2011) 168-169; LD Guruswamy 'Energy, Environment & Sustainable Development' (2005) 8 *Chap. LR 77.*
[137] Art. 4 UNFCCC; United Nations Framework Convention on Climate Change Copenhagen Accord, Framework Convention for Climate Change, United Nations, FCCC/CP/2009/L.7 (2009).
[138] A Eberhard 'The Future Of South African Coal: Market, Investment and Policy Challenges.' *Programme on Energy and Sustainable Development* (2011) 36-37.
[139] Hence the Climate Change White Paper; see also the sentiments of the court in *Company Secretary of Arcelormittal South Africa & another v Vaal Environmental Justice Alliance* (69/2014) [2014] ZASCA 184 (26 November 2014).

transitioning to renewable energy, if such transition implies loss of jobs in the economy and a general economic slow-down? How sustainable is renewable energy in the South African social and economic context where affordable, accessible, and reliable energy is a prerequisite for economic development?[140]

Apart from climate change, what other global imperatives are pushing for renewable sustainable energy? Of late, energy security has become a major issue at the international level. Many countries are faced with the choice of importing many of their energy needs in a changing global geopolitical environment characterised by conflict over resources and control.[141] In this regard, South Africa may not be seriously threatened as it, in fact, exports some of its electric power to neighbouring countries in the SADC region. The Southern African Power Pool (SAPP) is a useful regional power market structure that enables countries in Southern Africa to share infrastructure and enable trading in electricity.[142] A measure of security does come with regional pooling of resources and joint projects that could stabilise and feed more power into the regional grid. The proposed Inga II hydro project in the DRC must be seen in this light. From a regulatory perspective, there are no significant regional threats to warrant South Africa to worry about energy security in the sense of being self-reliant on domestic generation.

b) Domestic energy sector drivers for renewables.

South Africa faces serious energy security concerns at the domestic level. Energy security encompasses reliability or stability, affordability and general security of supply for industry.[143] Energy security is a critical driver of South

[140] National Development Plan 163 (objectives on the energy sector).
[141] The Russian-Ukrainian (European) crisis, conflicts in the Middle East and the unease rivalry between the USA and China over extractive resources in Africa are all self-evident.
[142] DT O'Leary, J Charpentier & D Minogue 'Promoting Regional Power Trade: The Southern African Power Pool' (1998).
[143] B Barton 'Energy Security in the Twenty-First Century' in B Barton et al *Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (2004) 457,459; A Goldthau & BK Sovacool 'The Uniqueness of the Energy Security, Justice, and Governance Problem' (2012) 41 *Energy Policy* 235. See also R Leal-Arcas & A Filis 'The Fragmented Governance of the Global Energy Economy: A Legal-Institutional Analysis' (2013) 6 *Journal of World Energy Law and Business* 348, 357.

Africa's efforts to diversify its sources of energy – a realisation that security of supply has been compromised due to lack of new generation capacity, years of under-priced electricity and sustained economic growth leading to a huge demand growth.[144] Capacity stagnated while efforts to introduce competition yielded no results. The argument that higher energy prices are bad for economic growth, jobs, and poverty reduction[145] is illogical as cheap electricity leads to an unsustainable economy hence the quandary that Eskom and the country find themselves in.

Demand has grown exponentially and the supply reserve margin has been gradually reduced to critical levels.[146] The outstripping of supply by demand is among the reasons why South Africa must move towards renewable energy. Eskom's precarious supply situation partly explains the commitment with which the REIPPPP was executed and the haste to move ahead with base load and nuclear procurement. Essentially, there is no energy market in South Africa and law can play a role in creating that market and thereafter regulate[147] it to ensure that services currently provided by the state owned monopoly continue to be provided with minimum impact on the consumers. The energy market must be created first. Pertaining to this Barton *et al* observe that '[t]he establishment of such new forms of tradable property requires enormous legal input – something overlooked in the economics literature…Considerable regulatory action is often needed to bring novel markets into being.'[148] A market for energy coupled with a price on carbon to stimulate appetite for renewable energy is dependent on how law is used to regulate the energy industry towards

---

[144] P Lloyd 'Restructuring South Africa's Electricity Supply Industry' (2012) 64 *FOCUS* 4, 10 ('At the end of the twentieth century, the cost of Eskom power was the lowest in the world; by 2005 it had become even cheaper…Eskom was unable to finance essential base load expansions; commerce, industry and households had no economic incentive to save energy.')

[145] A Pegels 'Renewable Energy in South Africa: Potentials, Barriers and Options for Support' (2010) 38 *Energy Policy* 4945, 4949.

[146] N M Odhiambo 'Electricity Consumption and Economic Growth in South Africa: A Trivariate Causality Test' (2009) 31 *Energy Economics* 5635, 5636.

[147]WWS Charters 'Developing Markets for Renewable Energy Technologies' (2001) 22 *Renewable Energy* 221 ('To accelerate market growth governments need to identify and remove legal and institutional barriers.')

[148] Barton (note 115 above) 22.

this objective. This is how economic instruments like the proposed carbon tax aid the transition to a low carbon energy mix.

Achieving the balance between the need to provide a service, which was originally a public service, and creating a viable market is the task of regulation through law. It borrows from the orthodox market failure (or absence) justification of regulation, only that now we are not regulating to control a market failure but rather to create a market and facilitate competition that could result in a sustainable energy system.

The reason why demand exceeded supply by 2008 was ineffective regulation[149] leading to poor planning in the energy sector in South Africa. This is happening because of the inability of NERSA to effectively exercise and enforce its legal mandates against Eskom. It is accepted that the current challenges are implementation lags, crippling future energy planning, as opposed to absence of regulation.[150] Too much was left to chance and to the vicissitudes of Eskom planning muddled with politics[151] as opposed to this being a national planning issue. Despite this, in fact Eskom did caution the government of the need to increase generation capacity relative to economic and demand growth.[152]

Apart from the demand-supply imbalances, there are other broad reasons why regulation is necessary at the domestic level. Tomain argues that:

> There are several reasons to regulate energy and industries. First, we should attempt to maximize the potential energy in each resource to have it distributed most efficiently, and to have it consumed most sensibly. Second, regulation can address problems of scarcity, and regulators must pay attention to price and the availability and reliability of energy… The third reason for regulation is to

---

[149] In effective regulation caused by both weak regulators and a weak legal architecture. See Pegels (note 145 above) 4945, 4947 (NERSA must allow realistic pricing of electricity, instead of pricing Eskom out of sustainability). It is not only Eskom that is to blame for the crisis that became apparent in 2008, and yet in 2015 it still haunts the country. The Department of Energy and NERSA must take responsibility for the situation also.

[150] F Blandy 'Dark days ahead for energy-strapped SA' *Mail & Guardian* (12 December 2007) <http://mg.co.za/article/2007-12-12-dark-days-ahead-for-energystrapped-sa >

[151] Krupa & Burch (note 135 above) 6254-6255.

[152] DA McDonald 'Electric Capitalism: Conceptualising Electricity and Capital Accumulation in (South) Africa 1' in D McDonald *Electric Capitalism: Recolonizing Africa on the Power Grid* (2012) 29.

> minimize the social, health, and environmental costs of energy production, distribution, and consumption.[153]

These triggers of regulation highlighted by Tomain are present in the South African energy industry. Inefficiency, scarcity, wastage, unreliability and social and environmental costs define the current state of the energy sector.[154] It took more than eight years to resolve the electricity crisis, despite the urgency shown by the government in 2008.[155]

South Africa is exposed to multiple pressures to shift towards renewable energy both from the domestic and international sphere. The international and domestic pressures pushing the country towards renewable and sustainable energy are set up against countervailing domestic pressures to maintain the status quo (cheap electricity) and a focus on socio-economic development, equality and addressing historical injustices. The latter objectives are often tangential to the call to transition to an energy mix dominated by renewables, which may see energy costs rising to unaffordable prices or unsustainable subsidy levels. The tension between the push and pull factors has resulted in policy contradictions and inconsistencies whose overall sequel is policy and legal uncertainty[156] more elaborated on in Chapter 4.

Mixed signals are sent to domestic and international investors as well as industry participants. This is easily understandable if it is acknowledged that South Africa is a developing country with the so-called 'two economies,'[157] namely, the extremely rich and the extremely poor. The policy imperatives coming from the incongruities in the economic and social relations can be complicated to respond.

Given the political, social, and economic context explained above, it would be uncritical to solely attribute the pressure to shift towards renewable

---

[153] JP Tomain *Ending Dirty Energy Policy: Prelude to Climate Change* (2011) 13.
[154] The demand for electricity has been regularly exceeding supply tripping the grid sporadically since 2008, while there is rampant wastage of electricity.
[155] Department of Energy, *National Response to South Africa's Electricity Shortage*, January 2008
[156] Krupa & Burch (note 135 above) 6258.
[157] L Gentle 'Escom to Eskom: From Racial Keynesian Capitalism to Neo-liberalism (1910-1994)' in McDonald (note 152 above) 50, 66 and 71.

energy to global environmental problems like climate change and global warming. Rather, I argue that the shift from conventional fossil fuels is driven by global environmental concerns, in addition to climate change, including the general shift towards sustainability and resilience in production and consumption systems; and the increasing threat of energy insecurity and potential future forecasted increase in the cost of energy carriers. The recently published draft update to the IRP 2,[158] points out that there are concerns regarding the security of coal and gas supply in the long term.[159] This is partly due to the cost competitiveness of wind and photovoltaic solar (PV) sources of energy.[160] Mitchell and Woodman content that a sustainable energy system is much more than GHGs emissions reductions.

> It will also require technological changes throughout energy systems infrastructure – transmission and distribution networks, supply chains, more advanced metering and appliances – as well as more social and institutional changes such as the way consumers treat energy supply or the way that systems management is viewed by policymakers and regulators.[161]

The transition to renewable energy cannot be explained by climate change per se, although it is one of the key drivers of the renewable energy clarion call. The confirmed link between GHGs from energy production processes and climate change makes the energy sector a key focus area.

In Chapter 1, it was noted that the energy sector is one of the biggest contributors to climate change through the emission of GHGs.[162] Is this a sufficient push factor to call for a renewed interest in the regulation of the energy sector and specifically enabling renewable sources? What role would regulation play in this sector in relation to the global imperatives to take action against climate change? The logical steps to take to reduce the emission of

---

[158] The IRP 2 draft update was published in November 2013.
[159] Ibid 35.
[160] In Bidding Window 3 and 4 solar and wind energy was progressively bid at lower prices than the initial bidding windows showing that in the long term the price could become competitive relative to fossil generated electricity. Eskom has already started showing resistance to long-term contractual power purchase agreements from IPPs fearing that might put it out of business.
[161] C Mitchell & B Woodman 'Regulation and Sustainable Energy Systems' in M Cave, R Baldwin & M Lodge *The Oxford Handbook of Regulation* (2010) 572.
[162] Carbon Tax Policy Paper (note 131 above) 19; Goldthau & Sovacool (note 143 above) 236.

GHGs from the energy sector is to make this sector more 'green' and 'sustainable' and it is the underlying argument of this thesis that this transition towards sustainability in the energy industry may not materialise at the desired pace without the aid of law and regulation.

c) Domestic environment-specific imperatives

Environmental challenges in South Africa presents an immediate justification for the desire to move towards renewable energy. Generating energy from coal, gas and diesel all contributes to air and water pollution,[163] environmental degradation from related extractive activities and impacts on food security and the general well-being.[164] This could be a violation of s 24(a) of the Constitution, which provides for a right to an environment not harmful to health and well-being. Apart from the standard reasonableness test,[165] there are no internal limitations to this right (s 24(a)) and therefore any activity or conduct that threatens someone's health or well-being is potentially a constitutional violation.

Given the effects of producing energy from the fossils noted above, it can be argued that in fact the current mode of producing energy is unconstitutional. Indeed, this is a possible interpretation and could be a basis to demand that South Africa must regulate the energy sector to move towards sources that do not unreasonably affect the *health* and *well-being* of its inhabitants. If this is the case, why has the government continued to approve new coal power plants and permit the operation of existing ones? Clearly, the Constitution does not

---

[163] AD Owen 'Renewable Energy: Externality Costs as Market Barriers' (2006) 34 *Energy Policy* 632, 636; *Hichange Investments (Pty) Ltd v Cape Produce (Pty) Ltd t/a Pelt Products & others* (expecting employees in conditions exposed to odorous sulphur dioxide); *Tergniet and Toekoms Action Group & 34 others v Outeniqua Kreosootpale (Pty) Ltd & others* [2009] ZAWCHC 6 (on what constitutes 'health').

[164] *MEC: Department of Agriculture, Conservation and Environment and Another v HTF Developers (Pty) Limited* 2008 (2) SA 319 (CC) (the meaning of well-being interpreted broadly); *Minister of Health and Welfare v Woodcarb (Pty) Ltd* 1996 (3) SA 155 (N) 164F (exposure to smoke violates the right to an environment not harmful to health and well being).

[165] For different analyses of the 'reasonableness test' see: Goldthau & Sovacool (note 143 above) 269; LJ Kotzé 'Phiri, the Plight of the Poor and the Perils of Climate Change: Time to Rethink Environmental and Socio-Economic Rights in South Africa?' (2010) 1 *Journal of Human Rights and the Environment* 135, 154-155; F Biermann *et al* 'The Fragmentation of Global Governance Architectures: A Framework for Analysis' (2009) 9 *Global Environmental Politics* 264.

envisage a cessation of any activity that may in fact affect health and well-being – rather the Constitution prohibits activities that go beyond what is tolerable in a human environment.[166] Therefore, a measure of pollution is inevitable in the process of living or economic production. Chapter 3 explores in detail how environmental laws can mediate between economic development (living) and environmental sustainability.

Furthermore, s 24(b) of the Constitution requires the government to take reasonable legislative and other measures to a prevent pollution, among other obligations, while promoting justifiable social and economic development. This right is qualified by the criteria of reasonableness. The duty to promote ecologically[167] sustainable development mandates the consideration of the energy profile of South Africa to see how it can drive sustainable development.[168] The current development paradigm is underpinned by the heavy use of energy, which is mostly produced from fossil fuels. To shift from the current – energy intensive – economic development model, to one that is low-carbon and produces less pollution from energy production, requires a shift in the regulatory approach itself. It is submitted that grounding environmental rights in the concept of sustainable development implies sustainable energy. Pollution prevention and sustainable use of non-renewable resources[169] thus become justifications for laws that promote renewable energy. The current energy system causes extensive pollution throughout the coal value and

---

[166] *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province & others* 2007 (6) SA 4 (CC).

[167] It has been argued that the NEMA definition of sustainable development in s 2 is ultra vires s 24(b) of the Constitution as it is not qualified with 'ecologically'. In other words, the concept of sustainable development in the NEMA is broader than envisaged by the Constitution, see S Woolman 'Environment' in *Constitutional Law of South Africa* (2014) 52 (fn131) ('The legal definition of sustainable development in NEMA s 2 is contrary to FC s 24(b) and thus unconstitutional, because it omits the adjective "ecologically." NEMA s 2 creates the impression that economic, developmental, and environmental interests are of equal value in the Final Constitution. That is clearly not the case.')

[168] *Fuel Retailers* (note 166 above) paras 44-45, 58-59, 61, 72-74, 76 and 79-80. (Constitutional Court expounding the meaning of sustainable development).

[169] These objectives are also encapsulated in the principles of environmental management in s 2 of the NEMA, see further discussion in Chapter 2 linking the principles to the need to promote renewables.

production chain and the energy production cycle. This pollution is a legitimate target of s 24 of the Constitution.

To elaborate, the coal mining causes extensive physical environmental damage, water and air pollution, and reduction of arable land for other uses, such as agricultural use and biodiversity conservation.[170] Coal power plants use a lot of water for washing and cooling. Regulation is necessary to curb the negative effects of using conventional sources of energy. This legal regulation must be founded on a theoretical foundation that promotes sustainable development, sustainable energy, and the principles that underpin s 24 of the Constitution as expanded in s 2 of the NEMA. This enables the state to fulfil its Constitutional obligation to prevent pollution, ecological degradation and promote conservation. Uncritical pursuit of the socialist, public interest approach that is economically and environmentally unsustainable must be interrogated. Equally, however, capitalism must be decoupled from its energy demands.

The Constitutional imperative is critical because it requires the state to take other measures apart from enacting legislation. To what extent has the state taken other measures to 'prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development'?[171] What role does 'ecologically sustainable development' play as a motivation for renewable energy? In a sense, the Constitutional provisions on environmental rights act as a push factor towards renewable energy. The mandate to enact legislation indicates the need for regulation through law to promote the objectives of the constitutional right to an environment not harmful to health or well-being, and ecologically sustainable development.

If sustainable development is a justification for requiring a shift towards renewable energy, which I argue it is, does this mean that renewable energy is necessarily sustainable. Not necessarily – yet it is desirable for the renewable

---

[170] *Director: Mineral Development, Gauteng Region & another v Save the Vaal Environment & others* 1999 (2) SA 709 (SCA)*; Harmony Gold Mining Co Ltd v Regional Director, Free State Department of Water Affairs & others* 2014 (3) SA 149 (SCA)*; Kebble v The Minister of Water Affairs and Forestry* 2007 JDR 0872 (SCA) (all cases dealing with the impacts of mining on the environment).

[171] Section 24 (b) of the Constitution.

energy sources to be low-carbon and geared towards sustainability.[172] The concept of sustainable development, its content, nature, and import have been analysed in Chapter 1 above. The concern here is to what extent is it actually a driver of the shift towards renewable energy and if so, does it push in the direction of using law as a regulation tool? Whether or not the renewable sources are themselves sustainable does not affect the argument that, more likely than not, we can promote sustainable development through renewable energy than non-renewable fossil fuels.[173]

A popular perception is that fossil fuels can be economically sustainable given the social, economic, and environmental circumstances of South Africa.[174] The idea is that energy produced from coal is not necessarily or inherently unsustainable taking into account that sustainability requires the integrated thinking and consideration of the environmental, social, and economic aspects of development.[175] Fossil fuels may not be environmentally sustainable, in an integrated analysis, but they may represent what South African can socially and economically sustain as a source of energy given its developmental agenda.[176] This takes into account the cost of producing energy, the price that can be charged optimally, the ecological impacts, and the alternative of providing the same amount of energy from renewable sources.

---

[172] IN Kessides 'Powering Africa's Sustainable Development: The Potential Role of Nuclear Energy' (2014) *Energy Policy* S57-S70; H-Holger Rogner 'Nuclear Power and Sustainable Development' (2010) 64 *Journal of International Affairs* 137-163; A M Omer 'Energy, Environment and Sustainable Development' (2008)12 *Renewable and Sustainable Energy Reviews* 2277.

[173] Renewable sources do have their own environmental impacts. See for instance the 'Final Environmental Impact Assessment for the Proposed Bokamoso Photovoltaic Solar Energy Facility near Leeudoringstad, Registration Division HP, North West Province.' Department of Environmental Affairs Ref No: 14/12/16/3/3/2/559 Environamics, (2014) 82; 'Environmental Impact Assessment Process Draft Environmental Impact Report Proposed Castle Wind Energy Facility near De Aar, Northern Cape Province, Department of Environmental Affairs Ref No: 14/12/16/3/3/2/278 Savannah (2014), 101-193 (detailing geophysical, visual, avifauna, noise, heritage, and ecological impacts of a wind farm); see generally S Szewczuk 'Review of the Wind Energy Activities in South Africa' (2014).

[174] Given that South Africa's economy grew around energy intensive industries including mining that has over centuries made coal mining and processes cheaper (without internalisation) it seems on face value that economically coal is sustainable relative to renewable sources.

[175] Section 2 (4) NEMA hence the focus by some on the so-called, clean coal technologies like 'Carbon Capture and Storage –CCS) which does not seem to be taking off.

[176] The strong sustainability perspective.

The above means that looking solely at the carbon content of sources, ignoring the social and economic context of using a particular source of energy cannot be used to assess the sustainability of an energy source. Thus, wind and solar are renewable and largely sustainable in the sense that they meet the environmental requirements of sustainability. Yet these sources are not necessarily economically affordable, accessible, or likely to reduce energy poverty among the poorest that do not have access to, and cannot pay for, energy in South Africa.

Similarly, cost-benefit analyses show that renewables can be costly and therefore not a financially (economically) sustainable option for some consumers under the current socio-economic circumstances.[177] Despite such analyses; and as will be shown below, such simplistic cost-benefit analyses hide a myriad of the impacts of fossils fuels. The need to internalise externalities has been advanced as a reason to demand regulation towards renewable energy. If we internalise the externalised impacts of fossil fuels, it becomes apparent that renewables are more sustainable that fossil fuels.[178]

The documented secondary impacts of energy generation and associated industries – externalities[179] are sufficient reasons to advocate for urgent action to create an appropriate legal framework for renewable energy. Every day, in South Africa there is news about the devastating environmental damage wrought by mining especially coal mining.[180] Recently, there has been an increasing focus on the apparently gratuitous granting of mining licences and not by coincidence mainly for coal mining.[181] This was in the wake of the 2008 electricity crisis that plunged South Africa into black outs or load shedding.[182] The ready granting of mining licences and the outcry it spawned, even the public confrontation between the Department of Minerals and the Department of

---

[177] Cost-benefit for renewables; L du Toit & J Glazewski 'Energy Law and the Environment' in Glazewski & du Toit (note 37 above) 18-13 (increased uptake of renewables can reduce the cost and prices).
[178] Omer (note 172 above) 2277.
[179] Owen (note 163 above) 6236-6237; R Baldwin, M Cave & M Lodge *Understanding Regulation: Theory, Strategy, and Practice* (2011) 18.
[180] *LegalBrief Environmental* by Juta chronicles such degradation regularly.
[181] The Centre for Environmental Rights (CER) requested for the moratorium under MPRDA.
[182] Centre for Development and Enterprise (CDE) 2008 Energy Crisis roundtable.

Water and Environmental Affairs,[183] exposed institutional and regulatory dilemmas that South Africa must deal with to promote sustainable development and synergy between the energy and environment regulatory frameworks.[184] This is one of the main reasons for advocating for a reform of the renewable energy regulatory framework.

While the regulatory contradictions between energy and environmental law are dealt with in detail in Chapter 4, it is important to note here that the disjuncture between these two fields has contributed to the foot dragging in terms of putting in place a law to promote renewable energy.[185] It would appear sensible that the department responsible for environmental affairs should play a central role in promoting renewable energy as this type of energy relies heavily on natural resources under the control of that department. Could this be the explanation of the absence of any driver behind the dormant Renewable Energy White Paper since 2003?

Apart from regulatory imperatives noted in the preceding paragraph, there are other environmental problems caused by the energy industry that necessitate legal regulation to promote renewable energy. The levels of air and water pollution causally connected to the energy industry are a cause of concern in South Africa.[186] While feeding into the global problem of climate change, the domestic health and environmental effects of the pollution are enormous.[187] It is clear that environmental legislation aimed at controlling air, water, and land pollution has proved mostly ineffective is dealing with pollution coming from the heavy energy industry.[188] Pollution control legislation must be

---

[183] Y Groenewald 'Mapungubwe Mining licences: Who will look after water?'' *Miningm*^{x} (19 March 2012).
[184] Becker & Fischer 'Promoting Renewable Electricity Generation in Emerging Economies' 452.
[185] There are certainly mandate and vision conflicts between the renewable energy lobby and the economic development lobby that has seen similar hugging and tagging among relevant government departments.
[186] HA Strydom & AD Surridge 'Energy' in H Strydom & N King *Environmental Management in South Africa* 773-775.
[187] Ibid.
[188] For instance, despite promulgation of more stringent atmospheric emissions standard, Sasol and other energy companies challenged the standards on the basis that they are not technologically and financially able to comply in the set time frames, see *Sasol Synfuels (Pty) Ltd & others v Minister of Water and Environmental Affairs & others* (High Court, Gauteng Division, Pretoria) Case No. 36444/14 (21 June 2014).

complemented by effective legislation to prevent such pollution from the energy sector at source. This entails the mandating of technology and emission standards[189] in energy and pollution control laws and not necessarily relegate this to a purely environmental regulation issue.

Reform of energy law is necessary to open the South African energy market to competition and thereby improve the service delivery and security of supply as noted above. One of the results of the 2008 energy crisis, which has persisted with frightening frequency into 2015, is that the energy industry and department of energy are realising that, apart from security of supply, the pricing of electricity has largely been left unattended for a very long time due to the oversupply in previous years.[190] While the economy grew exponentially on the back of the cheapest electricity in the world, the economic boom was fast raising the demand profile while no attention was paid to the necessary supply capacity. Eskom noted and prepared for this demand growth but was underfunded.[191]

The existence of restrictive regulation could impede socio-economic development and it has been identified as one of the key areas necessary for reform to enable the country to meet its developmental objectives.[192] In a roundtable that included government and Eskom delegates (sans the board) it was concluded that,

> '[s]imilarly, there remain considerable regulatory and policy obstacles in many other industries—important examples of which include telecommunications and *electricity generation*. Here, there is considerable scope for opening up the industry to greater competition and competitive forces.'[193]

---

[189] Standards and emission limits from environmental legislation are seen as intrusive and disruptive.
[190] Even now, the pricing approach adopted by NERSA is not sustainable and is part of the unintended incapacitation of Eskom.
[191] L McDaid 'Renewable Energy: Harnessing the Power of Africa? in McDonald (note 152 above) 202, 206-207.
[192] A Altbeker, E Storme & A Bernstein *Growth in a Time Of Uncertainty: Does South Africa Have a Growth Plan?* CDE Edited proceedings of a Round Table convened by the Centre for Development and Enterprise, Number 23, December 2013, 53. <http://www.cde.org.za/publications/jobs-growth/83-jobs-and-growth/425-growth-in-a-time-of-uncertainty-does-south-africa-have-a-growth-plan >; *South Africa's Electricity Crisis: How Did We Get Here? And How Do We Put Things Right?* CDE Round Table no 10, July 2008
[193] Ibid *(emphasis added).*

This observation sums up why South Africa's energy laws must be reviewed and reformed. If the energy sector is to play its enabler role in socio-economic development, reform is necessary. Without this reform, it will be difficult for IPPs and the private sector to bring investment into the renewable energy sector, let alone in the conventional energy sector itself.

Policy certainty is necessary to enable effective implementation of South Africa's development and economic growth policies (even though the three current policies are sometimes contradictory and divergent).[194] Regardless of any policy inconsistences among the current three economic development policies of South Africa; one common thread among them is the identification of the energy sector as critical for economic growth. The New Growth Path (NGP), National Development Plan (NDP), and the Industrial Policy Action Plan (IPAP)[195] acknowledge the role of the energy in enabling the achievement of the policy objectives and targets outlined in these policies. Without interventions to improve the energy supply situation, economic growth, job creation (unemployment) and growing South Africa's economy becomes a very slow process. However, developing laws to regulate the energy sector towards these objectives is not pure law, but a fraught political process[196] as shown by the dithering of the past two decades. Local pressures to move towards renewable energy are self-evident and South Africa acknowledges them while trying to develop policies to support that shift, yet transforming these policy aspirations into hard law has been a challenge in the energy sector, unlike in environmental law as detailed in Chapter 4.

---

[194] The National Planning Commission's (NPC) *Our Future Make it Work: National Development Plan* (2011) 163 (forecasting a decline in the energy intensity of the South African economy) and the Industrial Policy Action Plan Economic Sectors and Employment Cluster IPAP2013/14 – 2015/16, 121-122 contradict each other especially regarding the role of coal and mining on the one hand, and renewables on the other in the growth of the economy.

[195] National Planning Commission's (NPC) *Our Future Make it Work: National Development Plan* (2011) 163 (forecasting a decline in the energy intensity of the South African economy); Department of Trade and Industry, South Africa, New Growth Path Framework (2011); Industrial Policy Action Plan Economic Sectors and Employment Cluster IPAP2013/14 – 2015/16, 121-122 ('the dti has been working to develop a comprehensive Solar and Wind Sector Development Strategy. The strategy, which was approved in May 2012, identified seven Key Action Programmes: market facilitation, local manufacturing and industry upgrading incentives, local content requirements, technical and physical infrastructure, trade and investment support and facilitation, research demonstration and skills development.')

[196] Helm (note 4 above) 11.

d) The tipping point: 2008 electricity black outs.

The 2008 shortages in electricity were directly attributable to various factors, chief among which were the delays by the government to increase the supply capacity for the country, despite several warnings by Eskom that with increasing demand supply was soon to be outstripped. The shortages indicate that without an adequate supply margin, electricity can easily become a critical resource.[197] The insecurity engendered by the 2008 blackouts spurred the government, as the major shareholder in Eskom, to scramble for resources to fast track the build programme[198] in terms of which the generation capacity is to be enhanced. However, this was a case of too little too late, given the construction lead times involved in building new power plants.[199]

What remained was the now regular deployment of costly short-term interventions to either reduce demand or increase peak supply.[200] The demand side management programme was ramped up and contributed to a somewhat reduced demand, coupled with the reduction of demand from the intensive user groups, as well as, remotely, the global economic crisis.

What the 2008 electricity shortages show is that energy security should not be taken for granted as it is a crucial indicator of how stable an energy system is. The 2008 debacle betrayed the lack of security in the South African energy system, which persists to today as no new generation capacity has been brought on board.[201] The on-going construction at Medupi is bedevilled by several challenges whose cumulative effect is to push the commissioning dates further ahead. However, it is relevant that the lack of energy security exemplified by the 2008 blackouts is a prime driver of the need for the electricity sector to be diversified and opened up to the private sector, which can assist, by co-generating power including investing in renewable energy.

---

[197] Becker & Fischer (note 184 above) 451.
[198] A loan from the World Bank came handy for Eskom to fund construction at Medupi.
[199] Medupi power plant is behind schedule by over five years.
[200] Diesel powered plants literally gobbled Eskom's 2015 budget.
[201] NERSA in its System Adequacy Report for January 2015 reports that compared to 2007, energy demand has in fact been falling since 2009 (with the economic slowdown, yet supply remains precarious.

Authorities are agreed that South Africa faces an energy crisis that has recurred since 2008 to 2015 with consistent drop in the electricity availability factor,[202] and this is sufficient to spur the country to review its energy laws to enable a transition to a situation where energy security is improved. This study argues that the reforms are necessary, not only to promote energy security for its own sake, but also that such reforms will be an opportunity to make the whole energy system sustainable. This could address most of the international and domestic imperatives for regulating the sector discussed above.

A convergence of global, domestic and implementation as well as energy governance challenges all are pushing South Africa into a long-term energy deficit. This is despite economic growth slowing down since 2009, which logically should entail a reduction in energy demand and a higher availability factor. Climate change, environmental degradation, security of supply concerns, and the waning fortunes of Eskom represent a clear call to open the energy sector to private sector participation.

2.3. Role of regulation in energy markets

Renewable energy is finding it difficult to penetrate the energy system and markets in developing countries. This is not because of their inherent limitations or disadvantages; but mainly due to the exclusionary impact of the existing legal framework that has developed to protect an energy system that is based on conventional, centralised, and vertically integrated energy systems.[203] It is arguably a lesser challenge for renewables to overcome economic barriers,

[202] Despite prevarications by the government and Eskom, it is admitted that South Africa is now in constant state of electricity crisis, C Barron 'A Crisis for SA, But Not for Eskom, says Matona' Business Day (14 December 2014); Centre for Development and Enterprise (CDE) 'South Africa's Electricity Crisis: How did we get here? And how do we put things right?' Round Table Report No 10 (2008). The crisis is ably chronicled in the 'South Africa's Energy Crisis: Eskom 2008-2015' Financial Mail (19 March 2015).

[203] U Outka 'Environmental Law and Fossil Fuels: Barriers to Renewable Energy' (2012) *Vand. LR* 65; A Pegels (note 145 above); P Lloyd, B Cowan & N Mohlakoana 'Improving Access to Electricity and Stimulation of Economic Growth and Social Upliftment' (Paper presented at the Contribution to the Conference 'Improving Access to Modern Energy Services Through CDM and Technology Transfer' Eskom Conference Centre, 2004).

than it is for these sources to overcome legal and institutional obstacles[204] that have little connection to the sustainability potential of renewables.

This is a serious challenge especially in developing countries where the energy systems are not yet fully liberalised. Where the market has been liberalised it may be easier for renewable sources to penetrate the market, as the market is likely more active than the legal and institutional frameworks in those jurisdictions. This contrasts sharply with the situation in developing countries where the energy systems are still largely in the hands of state-owned utilities that monopolise, not only the industry, but also how it is regulated by the state regulators. The state owned monopoly utilities dominate energy sector policy directions, which can easily create serious regulatory barriers for the IPPs and new energy sources.[205] How to reform the legal and institutional environment is a serious barrier to renewable energy, once the economic arguments are deconstructed.[206]

Stimulating a renewable energy market can be effected through legal instruments or alternatively through other policy and market interventions that do not necessarily need to be framed in legal instruments. Economic regulators do more than just recommend legal activators for economic policy goals. For instance, economic regulators like NERSA have the advantage of being able to control how the market responds to various forces and price signals. Similarly, they can also use the market to send certain signals to consumers that could influence consumer energy choices among other market decisions. This is an advantage the NERSA is underutilising.

An important aspect of non-legal economic market regulation is that it may not achieve the intended reaction without legal consequences. This is precisely why economic regulation of the market is by itself insufficient to change the energy market to promote renewable energy. Legal regulation, in addition to providing more certainty, relative to non-legal regulation, has

---

[204] These obstacles are discussed in detail in Chapter 5 below.
[205] This is exemplified by the role the Eskom is playing in the design and implementation of the REIPPPP program in South Africa. The Power Purchase Agreements (PPAs) can only be concluded with Eskom, which currently owns the transmission and distribution of electricity. Outside the context, it remains a challenge for IPPS to break into the market.
[206] R Lyster & AJ Bradbrook *Energy Law and the Environment* (2006) 28-29.

potential to have a more direct impact towards the regulatory objectives or goals –hence countries successful in deploying renewable energy did so on the strength of positive policy reforms.[207] In other words, there is more force and directional push in legal regulation. It is submitted that this potential force of legal regulation makes it imperative to use it, in addition to market based incentive interventions, to promote renewable energy in South Africa. Parker and Braithwaite do caution though that, '[m]uch regulation is accomplished without recourse to rules of any kind. It is secured by organizing economic incentives to steer business behaviour, by moral suasion, by shaming, and even by architecture. On this broadest view, regulation means influencing the flow of events.'[208] They continue to argue that '[o]verly technical rules can also increase non-compliance by encouraging evasion and creative adaptation. As the technicality of rules increases so does the possibility, for less scrupulous players to find loopholes.'[209] This possibility makes market incentives an attractive complementary tool.

Certainly, the need for regulatory interventions to promote renewable energy comes from diverse dimensions. It is not only the environmental imperatives but also energy security and sustainability concerns that are motivating the increasing calls for a shift towards renewable energy.

2.4. Conclusion

This chapter demonstrated the evolution of regulation over time and the theories that have developed to explain why and how we regulate. In 2.2.1 I further analysed the global and local imperatives as to why South Africa must regulate the energy industry to enable renewables and gradually develop an energy market. While an exhaustive analysis of the theories of regulation is beyond the scope of this study, this Chapter has provided a framework for

[207] Edenhofer (note 136 above) 173 ('New policies, especially in the USA, China and the EU, are supporting this effort.')
[208] C Parker & J Braithwaite 'Regulation' in P Cane & MV Tushnet (eds) *The Oxford Handbook of Legal Studies* (2005) 119.
[209] Ibid 128.

understanding energy regulation. The concept of regulation, itself being contested, it is unsurprising that the theories that seek to explain this concept are also equally varied and divergent.[210] The focus of this study is to propose what approaches to modern regulation in the energy sector could promote a smooth and sustainable transition to renewable sources without economically crippling the country.

Public interest aspects of the approach must be grounded in the need to promote public interest encapsulated by s 24 and other Constitutional rights, access to energy, clean development, and socio-economic development. However, the public interest per se is insufficient to justify regulatory intervention. The social and institutional variables are decisive as argued by Baldwin[211] and further elaborated in the next Chapter.

Incumbency of conventional sources in the existing energy system is broadly shaping the change agenda and potential reforms. The impreciseness of the objectives and mandates of department relevant for renewable energy and regulators is attributable to 'siloed' legal frameworks and institutional arrangements. Given these silos, each department pursues its own regulatory objectives and sometimes informed by different theories. The energy and economic development departments likely worry about economic efficiency, while environmental and water affairs focus more on regulating for sustainability.

---

[210] R Baldwin, C Scott & Hood 'Introduction' in Baldwin, Scott & Hood *A Reader on Regulation* 2-3 (discussing the 'Three main meanings [of regulation], namely regulation as targeted rules, regulation as direct state intervention in the economy more generally, and regulation as encompassing all mechanisms of social control, by whomsoever exercised.')

[211] R Baldwin, M Cave & M Lodge *Understanding Regulation: Theory, Strategy, and Practice* (2011) 22; see also T Prosser 'Regulation and Social Solidarity.' (2006) 33 *Journal of Law and Society* 364-387 (arguing that market-failure rationale for regulation is too narrow and providing a jurisprudential basis for social solidarity as an objective of regulation), an argument he explores further in Prosser T *The Regulatory Enterprise: Government, Regulation and Legitimacy* (2010)18.

Legal regulation in this context can achieve results by providing certainty and security of investment.[212] However, there is no guarantee that if such a framework were created it would automatically ensure seamless synergy between environmental and energy law or address the barriers discussed below in Chapter 3. The need for regulatory interventions to promote renewable electricity comes from diverse dimensions. It is not only the environmental imperatives but also issues regarding energy security and sustainability that are motivating calls for a shift towards renewable energy. In order to fully understand the role that energy and environmental law can play to move South Africa's energy mix towards more renewables it is necessary to explain what the existing barriers are and then explore how legal regulation can address these barriers.

[212]A McHarg & A Ronne 'Reducing Carbon-based Electricity Generation: Is the Answer Blowing in the Wind?' in DN Zillman et al *Beyond the Carbon Economy: Energy Law in Transition* (2008) 288 ('Clearly, though, merely setting targets is not enough to ensure that these benefits are realized; they must be supported by an appropriate framework of laws and policies which promote, facilitate, and/or remove barriers to the expansion of renewable energy.')

Chapter 3
Barriers to Renewable Energy in South Africa

3. Introduction

> 'Traditional energy policy has erected roadblocks for new energy policy and has impeded the entry of new energy actors. Traditional energy policy not only favours fossil fuel firms, it also has created a regulatory mind-set that privileges short-term economic growth over long-term environmental protection and rewards business leaders, investors, and government regulators for sticking to the old path.'[1]

The transition to an energy mix where renewable electricity sources have a bigger share must confront and overcome several obstacles or barriers.[2] These challenges are known but their effect on the energy transition varies from place to place and from one technology to another.[3] A number of scholars have indicated barriers or obstacles that are prominent in the South African context,[4] while others have explored the challenges in a global context.[5] What is agreed is that regardless of the context, geographic and technological variations, the

---

[1] JP Tomain *Ending Dirty Energy Policy: Prelude to Climate Change* (2011) 6.

[2] U Outka *'Environmental Law and Fossil Fuels: Barriers to Renewable* Energy' (2012) 65 *Vand*. LR 1852 ('In a policy context, "barriers" (synonyms: obstacles, hindrances, impediments) are man-made factors or attributes of factors that operate in between actual and potential [renewable energy] development or use. They can be both intentional and unintentional. A barrier prevents or hinders action, impedes progress or achievement in realising potentials.'); A Verbruggen *et al* 'Renewable energy costs, potentials, barriers: conceptual issues' (2010) 38 *Energy Policy* 859 (arguing that the concept of 'barriers' is itself contested by different disciplines, thus what technologists see as a barrier may strike economists as a failure that need to be addressed by a trade-off).

[3] Outka, ibid; DN Zillman *et al* (eds) *Beyond the Carbon Economy: Energy Law in Transition* (2008) 546; BK Sovacool & MA Brown 'Competing Dimensions of Energy Security: An International Perspective' (2010) 35 *Annual Review of Environment and Resources* 191.

[4] H Winkler 'Cleaner Energy, Cooler Climate: Developing Sustainable Energy Solutions for South Africa' (2009); H Winkler 'Renewable Energy Policy in South Africa: Policy Options for Renewable Electricity (2005) 33 *Energy Policy* 27-38; A Pegels 'Renewable Energy in South Africa: Potentials, Barriers and Options for Support' (2010) 38 *Energy Policy* 4945-4954; JP Tomain 'Electricity Restructuring: A Case Study in Government Regulation' (1997) 33 *Tulsa LJ* 827-846.

[5] D Assmann, U Laumanns & D Uh (eds) *Renewable Energy: A Global Review of Technologies, Policies and Markets* (2006); O Edenhofer 'The IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation' (2011); Zillman (note 3 above) 10; S Shapiro & J Tomain 'Rethinking Reform of Electricity Markets' (2005) 40 *Wake Forest LR* 497-543. (studying barriers in South East Asian countries); E Martinot *et al* 'Renewable Energy Futures: Targets, Scenarios and Pathways' (2007) 32 *Annual Review of Environment and Resources* 205-239.

obstacles to renewable energy are pervasive and shared.[6] The development and selection of appropriate strategies to address these pervasive challenges remains a subject of much debate and research. Potential solutions have been proposed, and in some cases and countries, these have been experimented with. The results are mixed and appear to vary depending on a country's social, economic, political and ideological outlook and context.[7] Another pertinent finding is that legal and regulatory barriers (analysed in Chapter 4 and 5 below) feature invariably as a priority challenge.[8] The other challenges include economic cost, behavioural and cultural idiosyncrasies as well as technological feasibility.

This chapter analyses the key obstacles to the transition to renewable energy in the electricity energy sector of South Africa, in the backdrop of global barriers. Despite this broad treatment of barriers, the central focus of the study remains legal obstacles, with other obstacles being discussed to illuminate how addressing the legal framework challenges could trigger remedial of most of the obstacles. This provides a good background for Chapters 4 to 6, which seeks to understand the roles of energy and environmental law and regulation in ameliorating the effects of these barriers. In 2003, the South African government identified these barriers in the White Paper on Renewable Energy

---

[6] Edenhofer, ibid, 193 ('The various barriers are categorized as 1) market failures and economic barriers, 2) information and awareness barriers, 3) socio-cultural barriers, and 4) institutional and policy barriers This categorization is somewhat arbitrary since, in many cases, barriers extend across several categories.'); M Mendonça, D Jacobs & BK Sovacool *Powering the Green Economy: The Feed-in Tariff Handbook* (2009) 130 (categorising barriers into four main groups: financial and market, political and regulatory obstacles, cultural and behavioural barriers, and aesthetic and environmental challenges).

[7] Mendonça, Jacobs & Sovacool, ibid, 17; R Haas *et al* 'Promoting electricity from renewable energy sources – lessons learned from the EU, United States, and Japan' in FP Sioshansi *Competitive Electricity Markets: Design, Implementation, Performance* (2011) 437; J Sawin 'National Policy Instruments: Policy Lessons for the Advancement and Diffusion of Renewable Energy Technologies Around the World' in Assmann, Laumanns & Uh (note 5 above) 5, 71; Zillman (note 3 above) 547; Mendonça, Jacobs & Sovacool, ibid, 77 (comparing use of feed-in-tariff in several countries including South Africa); RL Ottinger, L Mathews & EN Czahor 'Renewable energy in national legislation: challenges and opportunities' in Zillman (note 3 above) 194 (illustrating the Californian and Indian financing models debacles).

[8] ME Mansfield *Energy Policy: The REEL World: Cases and Materials on Resources, Energy, and Environmental Law* (2001) 114 & 561; YO Omorogbe 'Promoting Sustainable Development Through the Use of Renewable Energy: The Role of the Law' in Zillman *et al* (note 3 above) 40; DME Energy Summit Outcomes (2007) 16.

Policy for South Africa[9] (Renewables White Paper) and tentative strategies were identified to surmount the challenges. Among other barriers, the Renewables White Paper notes the following:

> There are significant barriers to the further implementation of renewable energy that need to be addressed. The key issues include the following:
>
> - Many renewable energy technologies remain expensive, on account of higher capital costs, compared to conventional energy supplies for bulk energy supply to urban areas or major industries;
>
> - Implementation of renewable energy technologies needs significant initial investment and may need support for relatively long periods before reaching profitability;
>
> - There is a lack of consumer awareness on benefits and opportunities of renewable energy;
>
> - The economic and social system of energy services is based on centralised development around conventional sources of energy, specifically electricity generation, gas supplies and, to some extent, liquid fuel provision;
>
> - Financial, legal, regulatory and organisational barriers need to be overcome in order to implement renewable energy technologies and develop markets;
>
> - There is a lack of non-discriminatory open access to key energy infrastructure such as the national electricity grid, certain liquid fuels and gas infrastructure.[10]

Despite the adoption of several strategies and policy decisions, the question remains why South Africa still battles with the barriers to renewable electricity sources?[11] To this end, therefore, Chapter 6 evaluates the extent to which the proposed regulatory responses have been able to open the barriers and enable the transition.

---

[9] White Paper on Renewable Energy Policy for South Africa (2003) (Renewables White Paper) 9 (market power of utilities). The paper is exhaustively analysed in Chapter 3 (3.3.2) above.
[10] Renewables White Paper (note 9 above).
[11] For instance, the Department of Mineral and Energy Resources, Energy Security Master Plan for Electricity 2007-2027 is almost silent on renewable energy, providing just a paragraph at 40.

The barriers identified in the Renewables White Paper are cross-sectoral in that they range from economic, technical, environmental, institutional, regulatory, and legal and policy, as well as ethical obstacles.[12] Unmistakably, reforming a country's energy system can be an intricate process, hence the narrow interest of this thesis in legal and policy obstacles. Mitchell and Woodman appositely observe that:

> Energy systems are complex sets of inter-related components – technical, social and institutional – which have developed to support the dominant technologies. Shifting from large scale, centralised, energy systems based in large part on fossil fuels will require changes in all the system components in order that technologies which are currently "locked out" will have to become the logical technical choice.[13]

An intriguing inquiry, which underlies this study and consummated later in Chapter 6, is to identify if there is a key to unlock these barriers at once by addressing the weak legal framework for renewables. This weakness is also highlighted in Chapter 4 and 5 where existing energy and environmental laws are discussed, not only to show how they entrench fossil fuels, but also what opportunities they provide to remove the obstacles to renewable energy. The ingrained resistance to opening up to the sectors of the energy industry to private IPPs is supported by these equally entrenched laws and policies.

The entrenched laws and policies have created the social and economic environment that favours convention energy sources. It is for this reason that laws to reform this archaic energy law can unlock the energy industry and markets to sustainable renewable electricity.[14] The World Energy Council confirms this by reporting that:

> Public stakeholders recognise that, to change the trajectory of industrialisation and growth in energy use, attractive policy and regulatory frameworks encouraging investment in the development of energy infrastructure need to be created. Interviewees pointed out that developing consistent, stable energy policies and regulation, and maintaining a healthy energy infrastructure, requires a degree of experience, knowledge, and acquired skills that may not

---

[12] Renewables White Paper (note 9 above) 7.
[13] C Mitchell & B Woodman 'Regulation and Sustainable Energy Systems' in R Baldwin, M Cave & M Lodge (eds) *The Oxford Handbook of Regulation* (2010) 572, 586.
[14] Outka (note 2 above).

> exist in some least developed, developing or emerging countries… The importance and benefits of sustainable energy systems are clear. Nevertheless, creating a policy framework to achieve those goals remains a challenge for all countries.[15]

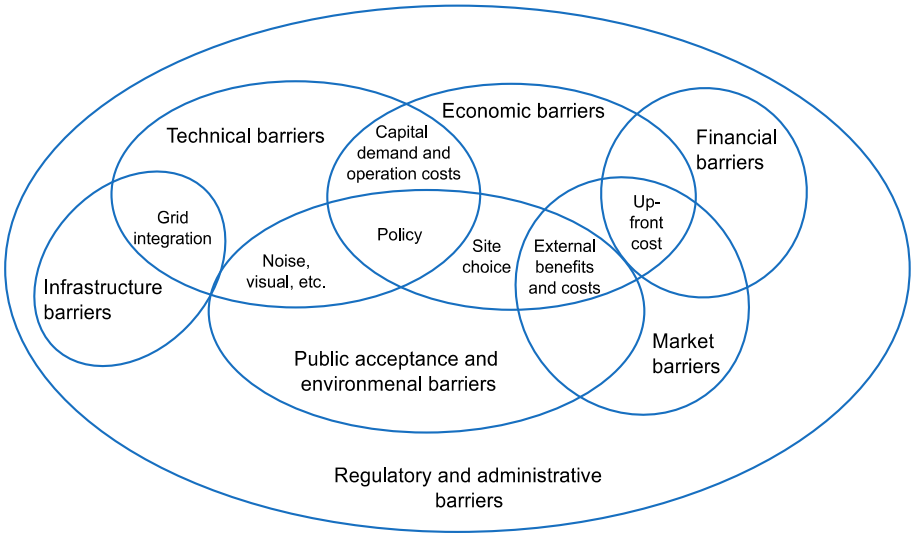
Yet the IPCC recently reiterated that enabling environments are key to reducing climate change in the energy sector by promoting renewable energy sources.[16]

The next section addresses the economic challenges and the implications for law as a regulatory instrument given the varied impact of different types of renewable energy sources on the economy and environment. Thereafter, the analysis shifts to institutional barriers, and this builds into the discussion of the closely related legal and policy obstacles to the transition. Mainstreamed throughout this discussion is an analysis of whether it is possible to reinvent the role of law to be enabling laws rather than forces legitimating the carbon economy? **Figure 2**, below demonstrates the importance of regulatory and administrative (legal and institutional) barriers illustrates the intertwinement of the barriers to renewable energy.

[15] World Energy Council *World Energy Trilemma: Time to Get Real – The Case for Sustainable Energy Investment* (2013) 7.
[16] IPCC 5th Assessment Report, Working Group 1 Report (2014).

Figure 2 Barriers to renewable energy development

Source: Adapted from Müller, Brown & Olz 'Renewable Energy: Policy Considerations for Deploying Renewables' IEA (2011) p33.



Key point: Barriers to RE technologies are interlinked.

3.1. Economic obstacles to renewable electricity

The South African economy is growing fast and is expected to continue to grow in order to address the multiple effects of poverty and underdevelopment carried forward from the apartheid regime. This recent economic growth and the consequent increase in electricity demand were not matched by relative increases in generation capacity, leading to the 2007–2008 power crises.[17] South Africa is an economically divided country where one finds the obscenely rich living side by side with the shockingly poor and impoverished. Several

[17] P Lloyd 'Restructuring South Africa's Electricity Supply Industry' (2012) 64 *Focus* 4, 10.

policies have been produced to anchor the country on a developmental path to solve the poverty and unemployment challenge.[18]

Among the drivers of economic growth enjoyed so far was cheap and abundant supply of electricity then based on a well-established conventional energy industry.[19] Electricity is perceived to be cheap as it is produced from the abundant coal resources.[20] The quandary that South Africa finds herself in, is how to continue this reliance on cheap sources of electricity to grow the economy while concurrently promoting renewable energy and thereby reducing its greenhouse gas (GHG) emissions and carbon footprint.[21] South Africa asks herself whether she can go green and low-carbon without compromising the achievement of her developmental agenda.[22] Indeed, these are the intractable economic policy and at times political[23] questions that this study confronts from a legal perspective. Can 'green' growth[24] deliver the same economic benefits as 'brown' growth?[25] Should the country and industry lower profit expectations and accept normal green growth? Will the government be able to create viable energy markets for renewable energy?[26]

Certainly, the state has a role to play in creating this energy market[27] but this is a huge complex issue for South Africa given the socio-economic priorities and foreign policy stance on climate change. Empirical research shows that

---

[18] GEAR, ASGISA and recently the National Planning Commission's (NPC) Our Future Make it Work: National Development Plan (2011) 163 (forecasting a decline in the energy intensity of the South African economy).
[19] H Strydom & N King *Environmental Management in South Africa* 2nd ed (2009) 768; R Spalding-Fecher & DK Matibe 'Electricity and Externalities in South Africa' (2003) 31 *Energy Policy* 722.
[20] M Fischer-Kowalski & M Swilling 'Decoupling: Natural Resource Use and Environmental Impacts from Economic Growth' (2011); National Development Plan (note 18 above) 94.
[21] Fischer-Kowalski & Swilling, ibid 87; National Development Plan (note 18 above) 143, 144.
[22] Pegels (note 4 above) 4949.
[23] D Helm *Energy, the State, and the Market: British Energy Policy since 1979* (2004) 11 noting that energy policy is inextricable entangled with politics.
[24] U Brand 'Green economy the next oxymoron? No Lessons Learned from Failures of Implementing Sustainable Development' (2012) *GAIA-Ecological Perspectives for Science and Society* 28-32 (critiquing the concept of green economy).
[25] Mendonça, Jacobs & Sovacool (note 6 above) 6 (asking 'How green can a job be in a dirty economy?').
[26] JP Painuly 'Barriers to Renewable Energy Penetration; A Framework for Analysis.' (2001) 24 *Renewable Energy* 73, 84 (aptly observing that government must intervene with regulation to remove market distortions.')
[27] Tomain (note 1 above) 5.

there are many data and information gaps that prevent a realistic assessment of the potential of the renewable electricity sector to create new employment.[28] Economic obstacles are factors that make renewable energy technologies uneconomic, costly, expensive, and have perceived negative consequences for economic growth. Conventional fossil fuels have established themselves and are economically 'crowding out' renewables. A transition to a new energy mix, no matter how gradual, may lead to economic slowdown in the short-term but not in the long-term. Opinions are divided on whether some of these factors are in fact barriers at all, or whether vested economic interests feel threatened by the renewable energy revolution and using economic arguments to defend the status quo.[29]

The economic or market-related obstacles to renewable sources of electricity feature among the main barriers globally.[30] Research indicates that governments, industry and the ordinary citizen are fearful of the potential economic ramifications of hastily displacing fossil fuel electricity and adopt renewable energy.[31] Industry fears the unknown economic consequences of shifting wholesale to a low-carbon green economy powered by renewables. The government, especially in South Africa, is concerned with the ramifications of its developmental agenda if, as the regulator, it steers the electricity industry towards a low-carbon economy, and how to handle the potential economic slow-down inevitable in such a transition.[32] Many people who are accustomed to the comfort of cheap and reliable electricity fear financial repercussions of the move to a new energy order. While recent signs of the unreliability of the current energy systems and the threatened continuation of such unreliability could

---

[28] R Spalding-Fecher 'Indicators of Sustainability for the Energy Sector: A South African Case Study' (2003) 7 *Energy for Sustainable Development* 40-41.

[29] Many environmentalists argue that the deliberated externalisation of the social and environmental costs of conventional fuels is a ploy to make them look economically cheaper and sustainable than renewables.

[30] Edenhofer (note 5 above) 194; R Haas *et al* 'Promoting Electricity from Renewable Energy Sources - Lessons Learned from the EU, United States, and Japan' in FP Sioshansi (note 7 above) 419, 420.

[31] E Martinot *et al* 'Renewable Energy Futures: Targets, Scenarios, and Pathways' (2007) 32 *Annual Review of Environmental Resources* 205-239.

[32] Fischer-Kowalski & Swilling (note 20 above); Helm (note 23 above) 11 (governments and not markets must balance the interests of future generations and the present rich and the environment).

potentially spur citizens to shift their economic thinking on renewable energy sources, many are still hoping for cheap reliable coal power.

The NERSA has attempted to play its role by using price determinations that economically signal a shift towards charging realistic and cost-related rates for electricity.[33] A primary challenge is for the renewable energy industry to generate electricity at relatively comparable economic and financial cost to fossil energy.[34] This challenge by implication requires an overhaul of the energy markets and industry in such a way as to address the market-related barriers and distortions that undergird the fossil-based electricity sector. Unless renewable energy sources are able to economically compete with fossil sources in terms of the cost and pricing of electricity, it is an uphill battle for renewables to gain a substantial share of the energy mixes of many countries. For the time being renewables remain more expensive, but IRENA studies, using South Africa as an example, show that the levelised costs of solar (PV and CSP), biomass and wind are fast approaching competitiveness against coal power.[35]

Currently, most renewable sources of energy allegedly are unable to compete with energy produced from fossil fuels in the existing thinking and regulatory system.[36] Wind, solar, geothermal, and other new renewables remain

---

[33] Eskom Revenue Application: Multi-Year Price Determination 2013/14 to 2017/18 (MYPD 3) (2012) ('Eskom needs to keep the lights on and this has a cost. For historical reasons, electricity is currently charged at below cost-reflective levels and is not sustainable. Electricity prices need to transition to cost-reflective levels to support a sustainable electricity industry that has the resources to maintain operations and build new generating capacity, guaranteeing future security of supply.').

[34] Despite wind and solar being bid at lower per kilowatt price compared to the forecasted cost of electricity from Medupi when complete, price is only one aspect that can give renewables a competitive advantage. Eskom enjoys other structural and institutional advantages that must be dealt with first to create a competitive energy market.

[35] IRENA 'Africa's Renewable Future: The Path to Sustainable Growth' Abu Dhabi (2013) < http://www.irena.org/documentdownloads/publications/africa_renewable_future.pdf>, see also O Edenhofer *et al Renewable Energy Sources and Climate Change Mitigation: Special Report of the Intergovernmental Panel on Climate Change* (2011) 759; J Goldemberg *World Energy Assessment: Energy and the Challenge of Sustainability* (2000) 267.

[36] MIT Coal Energy Study Advisory Committee *The Future of Coal: Options for a Carbon-Constrained World* (2007) <http://web.mit.edu/coal/The_Future_of_Coal.pdf >.

expensive to use as primary base load sources of electricity.[37] The initial capital costs are huge and they require high pricing to recoup the cost with a margin of profit. Cost competitiveness is therefore repeatedly identified as one of the major obstacles to the transition to renewable sources of electricity, but experts agree this has become less of an obstacle.[38] Statistics indicate how solar, wind, geothermal; wave tidal power and other sources measure up against fossil fuels.[39] Some of these studies acknowledge that while renewable sources of electricity are expensive to initially build and commercialise, the long-term cost is comparable to fossil and nuclear-based electricity.[40]

For instance, photovoltaic solar is expensive to buy and install but once installed it can go for over thirty years with miniscule maintenance costs. Similarly, the cost of buying and installing wind turbines are high, yet once towering up, they stand for a long time with minimum maintenance and running costs compared to a coal, gas or nuclear-fired plant.[41] Service maintenance and running costs is a key differentiator of the various energy sources and one of the factors that makes renewable energy feasible in the long term.

Most of the studies that portray renewable sources of electricity as being costly are largely based on assumptions that are being challenged in this study and other studies.[42] Comparing renewables to fossils using the current legal

---

[37] IPCC 5th Assessment Report, *Working Group III – Mitigating Climate Change* (2014) ('Since the Intergovernmental Panel on Climate Change (IPCC) 4th Assessment Report (AR4), many renewable technologies have substantially advanced in terms of performance and cost and a growing number of renewable technologies have achieved a level of technical and economic maturity to enable deployment at significant scale (robust).'); Pace University *UNEP Handbook for Drafting Laws on Energy Efficiency and Renewable Energy Resources* (2007)106; S Karekezi & W Kithyoma *Energy Initiative Renewable Energy Development* (2003)18.

[38] E Martinot 'Renewables Global Futures Report 2013' Renewable Energy Policy Network for the 21st Century (REN21, 2013) 10
< http://www.ren21.net/Portals/0/documents/activities/gfr/REN21_GFR_2013.pdf > ('many experts also believed that technology and cost are no longer the fundamental issue.')

[39] Spalding-Fecher & Matibe (note 19 above) 728; Verbruggen *et al* 'Renewable Energy Costs, Potentials, Barriers: Conceptual Issues' (2010)38 *Energy Policy* 859; J Goldemberg & TB Johansson *World Energy Assessment: Overview: 2004 Update* (2004) 50.

[40] Goldemberg & Johansson, ibid, Martinot (note 38 above) 12.

[41] Pace University (note 37 above) 106-107.

[42] Mendonça, Jacobs & Sovacool (note 6 above) 141; Pace University, ibid, 106; Goldemberg & Johansson (note 39 above) 49; National Academy of Sciences 'Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use' (2010) Committee on Health, Environmental and other External Costs and Benefits of Energy Production and Consumption 71 *et seq.*

regulatory, social and economic costing structures is not defendable. In order to compare sources of electricity, one must take into account the high levels of subsidies that governments channel to fossil energy mainly through state-owned power utilities.[43] Secondly, the comparisons do not acknowledge the externalisation[44] of environmental and social costs of using fossil sources, and pretend that these do not matter especially if they cannot be valued.[45] Challenging this approach, various studies have undertaken integrated comparisons that take into account the full cost of producing electricity from fossil fuels and the environmental economic footprint of both renewables and no-renewables.[46] These latter studies indicate that economically, and based on full cost accounting, fossil produced electricity is not that cheaper than renewable electricity.[47] The comparisons are often distorted by existing favourable treatment of fossil fuels, which, for a long time, made electricity artificially cheaper in South Africa.[48] Under the Eskom Build Programme, Medupi power plant which is under construction, when complete will be one of the largest coal power plants in the world. However, it will also add 29-million tonnes of carbon emissions. The increases in electricity prices to finance the

[43] International Energy Agency (IEA) *World Energy Outlook 2014 - Executive Summary (WEO-2014)* 4 ('Fossil-fuel subsidies totalled $550 billion in 2013 – more than four-times those to renewable energy – and are holding back investment in efficiency and renewables'); Ottinger, Mathews & Czahor (note 7 above) 186; Pace University (note 37 above) 371-372.
[44] Mansfield (note 8 above) 14.
[45] C van Horen *Counting the Social Costs: Electricity and Externalities in South Africa* (1996); Goldemberg & Johansson (note 39 above) 51 and 73; A Stirling 'Limits to the Value of External Costs.' (1997) 25 *Energy Policy* 517-540.
[46] RL Ottinger 'Getting at the True Cost of Electric Power.' (1990) 3 *The Electricity Journal* 14, 23; K Lang, P Wooders & K Kulovesi 'Increasing the Momentum of Fossil-Fuel Subsidy Reform: A Roadmap for International Cooperation' (2010) IISD 339; Verbruggen *et al* (note 2 above).
[47] Ottinger, ibid, 16-17; O Hohmeyer 'Renewables and the Full Costs of Energy' (1992) 20 *Energy Policy* 368 & 370; SANEA 'Wind power cost drops even further' confirms this based on the rate at which renewables were bid in Round 3 of the REIPPPP, SANEA state that 'Wind power in Round 3 was approximately 31c/kWh or 30% cheaper than the projected cost of new coal power from Eskom's Medupi plant. This is in addition to the pollution cost of coal power ("externalities") that the University of Pretoria estimates as being an additional 90c/kWh as an absolute minimum.'
[48] J Krupa & S Burch 'A New Energy Future for South Africa: The Political Ecology of South African Renewable Energy' (2011) 39 *Energy Policy* 6254, 6255; A Eberhard 'From State to Market and Back Again: South Africa's Power Sector Reforms' (2005) 40 *Economic and Political Weekly* 5309, 5316–5317.

construction shows that it could have been cheaper to put the funds into wind energy.[49]

Nevertheless, full cost accounting is only a component in a bigger multipronged approach to enabling renewables to be competitive – there are limits to what can be achieved through internalisation only.[50] In this regard Antheaume argues that:

> the avoidance cost of an externality may sometimes be higher than the actual cost of damages to the natural environment. If that is the case, then one should not be surprised to observe that damage is allowed to happen. However, at the lower end of the range, avoidance costs appear to be lower than the cost of damages. This would suggest that society is not entirely rational in choosing to let the damages happen.[51]

Attempts to incorporate the full cost of producing electricity from coal or nuclear for instance should not be costlier than the damage caused by coal or uranium mining. In other words, in such situations it is not cost effective to fully account for the energy source in the pricing.

Studies that show renewable energy sources as becoming economically competitive in relation to fossil fuels still acknowledge that the cost of renewable sources must come down to compete with fossils, even after having addressed the market distortions.[52] Politicians are concerned by these studies as they lack the political will to address the economic obstacles to renewable energy given the socio-economic implications of doing so.[53] There is uneasiness with the recommendations from these studies that seek to revolutionise how governments regulate the electricity energy sector and how energy utilities relate to governments. Similarly, recommendations to privatise state-owned energy utilities or unbundle them are often met with resistance by both the state

---

[49] New technologies have not attained the deployment scale capable of displacing coal given the up and down stream linkages established for coal.
[50] P Söderholm & T Sundqvist 'Pricing Environmental Externalities in the Power Sector: Ethical Limits and Implications for Social Choice.' (2003) 46 *Ecological Economics* 333-350; A Stirling 'Limits to the value of external costs.' (1997) 25 *Energy Policy* 517-540; A Stirling 'Valuing the Environmental Impacts of Electricity Production: A Critical Review of Some "First-generation" Studies.' (1998) 20 *Energy Sources* 267-300.
[51] N Antheaume 'Valuing External Costs–From Theory to Practice: Implications for Full Cost Environmental Accounting' (2004) 13 *European Accounting Review* 443-464, 458.
[52] IPCC (note 37 above), Chapter 7, 54 and 72; Edenhofer (note 5 above).
[53] Goldemberg (note 35 above) 267.

and the utilities.[54] There is comfort in the familiar and great fear of the unknown in the proposed renewable energy markets.

Comfort in the familiar and the effect of studies that portray renewable electricity as being expensive and financially uneconomical has ripple effects upon other variables. Thus funding for renewable energy projects becomes difficult to secure as banks and other financial institutions are worried that given the huge initial costs involved, and the need to sell renewable electricity at high prices, they may not be able to recover their investments.[55] There is a perceived high risk in investing in new untested and experimental technology relative to investing in established technologies where credit lines and business relations have become solidified.[56] Thus, it was easier for the World Bank to give Eskom R3-billion to build Medupi and Kusile power plants while only a fraction of that funding went into experimental renewable electricity projects.[57] There is perceived security in existing fossil-based energy sources despite their negative impacts on the environment. This security of investment is also supported by the legal environment, which regulates financial institutions and the investment laws. Financial institutions need a change in this environment for their economic approach to lending to also change.

Perhaps interventions that influence the funding environment and compel financial institutions to do environmental due diligence before funding energy projects could indirectly channel funds towards renewable energy projects. Lender liability for environmental damage resulting from fossil energy could spur financial institutions to action in terms of decisions as to what technology to fund. This approach ideally integrates environmental law into decision-making processes that affect technology choices in the energy sector and therefore comports with the call in the next chapter to bring energy and environmental law towards the same course.

---

[54] Eberhard (note 48 above).
[55] Edenhofer (note 5 above) 194; DP Goldman, JJ McKenna & LM Murphy *Financing Projects that Use Clean-Energy Technologies: An Overview of Barriers and Opportunities* (2005) 3-4.
[56] F Beck & E Martinot 'Renewable Energy Policies and Barriers' (2004) 5 *Encyclopaedia of Energy* 6; Pegels (note 4 above) 4948.
[57] Martinot *et al* (note 31 above); D Hallowes 'The World Bank and Eskom: Banking on Climate Destruction!' (2009) Groundwork; S Njobeni 'Eskom Sizes up $1bn Loan for Clean Power' *BusinessDay* (15 October 2010).

Lender liability[58] should not be imposed only for the resulting environmental damage caused by fossil fuels, but should be considered at the early design phase of energy projects when electricity utilities approach financial institutions for funding. Similarly, where utilities are state-owned monopolies an approach that takes into account the financial drivers of this orthodox technology must be visited with liability for supporting the technology. Governments that disadvantage renewables by supporting fossil fuels should be asked to pay for the cost of environmental and health impacts of fossil fuels. This could indirectly address the issue of subsidisation of the fossil fuel industry as the full cost of remedying the environmental impacts could be offset against the subsidies given by the government.[59]

A further economic challenge is the fear of unbundling and privatisation particularly in a developing country context even though this may have been done successfully in some developed economies.[60] Renewable sources are unable to compete with fossil energy currently as the established energy industry is mostly supported by government through state monopolies. This is especially the case in many developing countries. Even in developed countries privatisation and deregulation[61] has not yet been fully embraced. Privatisation and removal of the monopoly power of state-owned energy utilities could open up the competitive space of renewable energy players. This could also indirectly remove some of the financial and regulatory support that the fossil fuel industry currently enjoys from the government.[62] If accompanied by an opening of the energy sector to private industry and investors these strategies can produce positive results. It is in the latter environment that renewable energy sources could find a better way into the energy mix.

---

[58] Currently South African environmental law does not provide for explicit lender liability, yet South African courts in interpretation the right to an environment not harmful to health and well-being have the power to refer to foreign and international law that provide ample authority for lender liability where there was no due diligence in lending to an activity that leads to violations of environmental law.
[59] Goldemberg (note 35 above) 264.
[60] Helm (note 23 above); Sioshansi (note 7 above) 2809.
[61] Painuly (note 26 above) 86.
[62] Helm (note 23 above).

Privatisation, commercialisation and unbundling have their own inherent challenges, but arguably these challenges are tolerable and controllable compared to the carbon and environmental footprint of state monopolies that heavily rely on fossil fuels.[63] There have been arguments for Eskom to be restructured[64] (privatised or unbundled) to improve its efficiency and possibly open it up to competition from IPPs. This has not found favour with the government, which is set to continue supporting Eskom and afford it financial and economic privileges that the private energy industry cannot access.[65] Eskom can afford to build new power plants without the funds to do so, or on loans guaranteed by the state. It can afford to charge low prices for its electricity given the regular subsidisations by the state (although this is just about to change – see *MYPD* for 2017). As a shareholder the state sometimes defers its dividends in return for Eskom taking a low rate adjustment.[66] Despite these economic and financial advantages Eskom remains inefficient and unable to match supply to demand. Since 2008 the advent of winter is accompanied by the discomfort of unexpected power outages and planned load shedding.[67]

Consistent with the orthodox approach to evaluation of energy sources South Africans are often told that renewable energy is more expensive than fossil fuels energy and threatened with potentially huge electricity bills that are likely to come with a sudden wholesale shift to renewable electricity.[68] South

---

[63] Martinot *et al* (note 31 above).
[64] Department of Minerals and Energy Electricity Distribution Industry Restructuring Blueprint Report (2001), Energy Policy White Paper (1998) 42; Renewables White Paper (note 9 above) 7 (restructuring of Eskom); restructuring has been delayed by security of supply concerns and the need for new generation capacity - see A Eberhard 'The Political, Economic, Institutional and Legal Dimensions of Electricity Supply Industry Reform in South Africa' (2003) 2.
[65] Martinot *et al* (note 31 above) 6255; Eskom has been allocated the bigger Build Programme share under the *Integrated Electricity Resource Plan for South Africa* (IRP 2), not to mention guarantees for coal plant loans; see also Deloitte 'Demystifying tariff setting – the tariff conundrum – lower rates now, blackouts later?' (2013) 4 <http://www.deloitte.com/assets/Dcom-SouthAfrica/Local%20Assets/Documents/Demystifying_Tariff_Setting.pdf >.
[66] This happened in 2012, see P de Wet 'Eskom Power price hikes deferred, rather than denied' *Mail & Guardian* (9 March 2012) <http://mg.co.za/article/2012-03-09-Eskom-power-price-hikes-deferred-rather-than-denied>.
[67] T Creamer 'Several Cities Publish Schedules, but Eskom Says there is no Immediate Load-Shedding Plan' Engineering News (3 June 2013); L Donnelly 'Blackout alert' *Mail & Guardian* (8 October 2010).
[68] The REIPPPP has shown that this argument can no longer be defended with respect to the main renewable sources such as solar photovoltaic, water heaters, and wind energy.

African studies should also account for the full cycle of producing electricity from fossil fuels discussed in the previous chapter. The social and environmental cost of using fossil fuels is seldom included in the pricing of electricity.[69] Citizens are not aware of these costs as they are shifted to other sectors and regulators to deal with. The health effects and cost of air and water pollution are left to the departments of Public Health, and Water and Environmental Affairs. The Department of Mineral Resources champions the extraction of fossil fuels oblivious to the resulting environmental impacts that are left to the Department of Environmental Affairs to manage and sometimes pay for. When Eskom approaches NERSA to apply for rate adjustments they seldom talk of the full cycle cost of coal preferring to start from the already distorted cost of processed coal.[70] The final price determinations are far removed from the economic, social and environmental reality of digging, producing, and processing coal.[71] Rate setting has never been realistic in terms of the actual cost of producing electricity from fossils. The price of electricity has invariably been artificially low to allegedly respond to the consumer needs and circumstances,[72] yet this approach forgets the consumers' environmental and health needs.

At another level, however, many energy users in South Africa either cannot or are unwilling to pay for electricity.[73] This is especially the case in high-density and informal settlements. The government has exacerbated this ideology by its free basic electricity policy,[74] which assumes that there must be a level of free service provided by giving free electricity. Who pays for the production of this electricity and at what cost to the economy and the

---

[69] Van Horen (note 45 above); Goldemberg (note 35 above).
[70] See Eskom (note 33 above). Du Plessis notes that South African energy laws do not account for 'the cycle of production, exploitation, transport, distribution and consumption' of energy - see W du Plessis 'South Africa' in K Deketelaere et al (eds) *International Encyclopaedia of Energy Law* (2015) 189.
[71] Often focusing on the poor MYPD 2012-2017 ('Eskom believes poor households should be protected from the impact of electricity price increases through targeted, transparent cross-subsidisation in accordance with a national cross-subsidy framework. Failure to achieve cost-reflective prices sooner will impact on South Africa's economy and its growth prospects.').
[72] Eskom (note 33 above); Ottinger, Mathews & Czahor (note 7 above) 19.
[73] Municipality lose substantial revenue through illegal connection and tampering with consumption meters.
[74] Electricity Basic Services Support Tariff (Free Basic Electricity) Policy GN 1693 in GG 25088 of 4 July 2003.

environment? The focus on comfort and western notions of good standard of living has overshadowed any thoughts of sustainability. It has thus been contended that both energy generators and consumers preach sustainability during the day only to cry foul by night when their comforts are taken away or fully charged for. As Outka argues '[c]ost for both fossil and renewable resources are clearly miscalibrated, with social costs of fossil energy still unaccounted for in terms of price, and environmental and health benefits of renewable energy going mostly unrecognized in economic terms.'[75]

A more fundamental challenge is how to manage the effect of a transition, no matter how gradual, on the economy? Shifting to a green low-carbon economy is perceived to be a huge challenge because of the entrenchment of fossil fuels.[76] The perceived inability of renewables industry to completely replace the fossil industry is seen as an obstacle to the transition to renewable energy. [77] Assurances are needed that renewable energy will replace and provide more employment and be able to sustain the economic growth path on which South Africa has embarked.[78] These are matters that the renewables sector cannot readily prove and therefore creating doubt in regulators and consumers. As Outka argues, '[c]osts are also dependent on the regulatory context in which they are defined and comparability depends on the assumptions employed.'[79]

It is clear that the price of electricity, the cost comparisons between fossil fuels and renewables is dependent on the regulatory approach taken and the willingness to use regulation to promote renewables. Most of the economic obstacles manifest in this regulatory inertia and resistance to change from the current electricity supply and pricing systems.

[75] U Outka (note 2 above) 1682.
[76] Martinot (note 31 above).
[77] Goldemberg & Johansson (note 39 above); Mendonça, Jacobs & Sovacool (note 6 above).
[78] Ibid, Mendonça, Jacobs & Sovacool 7.
[79] Outka (note 75 above) 1690.

3.2. Social and behavioural barriers

From a social perspective the transition to renewable sources present a challenge to many consumers. The unfamiliar appears to be always intimidating to many while to the few it represents opportunity. Like economic obstacles, social obstacles originate in lack of knowledge and understanding of how renewable energy works judged by its own standards.[80] Comparing renewable energy to non-renewable fossils inevitably creates an unfair advantage for fossil fuels given the social acceptance of fossil sources. The conventional sources are what consumers have tested and used for hundreds of years and they fully understand the security, risks and reliability that comes with coal, gas and nuclear.

On the other hand, many electricity consumers are not sure whether to trust what researchers say about renewable electricity. Raising awareness and building the trust of consumers in renewable sources is a big social challenge.[81] Pasqualetti aptly observes that:

> [t]he mistake commonly made in the name of a renewable energy future is to consider the technical and economic challenges of commercialisation as the only obstacles that must be overcome in order to make the leap from dream to reality. Government programs and industry attention allot little weight to the identification and remediation of social barriers.[82]

This is compounded by the unhelpful economic studies that paint renewables as beyond the reach of many. The lack of awareness affects all sectors of society from the well to do, to the rural dwellers that rely on fuel wood. The long historical acclimatisation to the use of fuel wood means that it has become a way of life and part of a people's culture in rural areas. It is challenging to convince sectors of society to abandon the use coal and fuel wood or to use

[80] Mendonça, Jacobs & Sovacool (note 6 above) 130.
[81] Ibid 139.
[82] MJ Pasqualetti 'Social barriers to renewable energy landscapes.' (2011) 101 *Geographical Review* 201-223, 219.

these differently than they have done for hundreds of years. There are costs involved in services and infrastructure.[83]

Sometimes the way a meal is prepared is tied to the energy used for heating, thus energy choice transition like, community participation in natural resource conservation must be premised on the correct approach, which takes into account the needs and aspirations of the communities.[84] Steven Hoffman and Angela High-Pippert aptly note that:

> [a]ll [the] various disciplinary perspectives converge to a single, important conclusion, namely, that the successful diffusion of technology, or more generally energy-related programming, depends as much upon the technology itself as the political and social context in which the technology is located. In the case of distributed or alternative energy systems, an effective diffusion process would begin with local agents who possess technical expertise regarding the behavioural changes required of households or business owners.[85]

There is therefore a need for the 'socialisation' and 'culturisation' of renewable energy sources, where it is promoted to communities with a positive spirit that appeals to society's cultural and lifestyle needs, rather than purely economic/financial and low-carbon concerns. Raising awareness is necessary to build confidence and trust in renewables.

However, the awareness must begin by placing renewable energy within a community's social and cultural preferences and then shift to a new energy choice culture, then lastly the low-carbon, climate change and entrepreneurship jargon.[86] In this regard the IPCC correctly concludes that:

> [i]n both developed and developing countries, governments, social organizations, and individuals have tried to change cultural attitudes towards emissions, energy use, and lifestyles. For example, household energy-use

---

[83] Sioshansi (note 7 above) 2809.

[84] E Algotsson 'Wildlife Conservation through People-Centred Approaches to Natural Resource Management Programmes and the Control of Wildlife Exploitation' (2006) 11 *Local Environment* 79, 85.

[85] S Hoffman & A High-Pippert 'Institutional and Community-based Initiatives in Energy Planning' in S Fudge *et al* (eds) *The Global Challenge of Encouraging Sustainable Living: Opportunities, Barriers, Policy and Practice* (2013) 235, 244 (footnotes omitted).

[86] MI Howells *et al* 'A Model of Household Energy Services in a Low-income Rural African Village' (2005) 33 *Energy Policy* 1833, 1834 ('Apart from lack of funding, one of the main obstacles to facilitating this energy "transition" away from traditional fuels towards modern fuels is the lack of knowledge by policy makers about that factors that determine energy choices by rural consumers').

> patterns for space and water heating differ significantly between Japan and Norway because of lifestyle differences. Some have argued that the bio-cultural heritage of indigenous peoples is a resource that should be valued and preserved, as it constitutes an irreplaceable bundle of teachings on the practices of mitigation and sustainability. Sometimes local strategies and indices have metamorphosed into national policies, as in the case of 'Buen Vivir' in Ecuador and 'Gross National Happiness'. In rich countries, and among social groups with high levels of environmental awareness, interest in sustainability has given rise to cultural movements promoting change in modes of thought, production, and consumption. Including the cultural dimension in mitigation policies facilitates social acceptability.'[87]

Instead of seeing renewables as socially and culturally unappealing energy users must be educated to see the socio-cultural values and opportunities. Lack of information and awareness on the benefits of renewable energy is a major obstacle in reaching out to consumers who tend to assume that conventional energy is cheaper and reliable than anything else. Even consumers who rely on fuel wood energy tend to believe that anything other than grid-based power is not sufficient to provide them with modernising energy.[88] This poses challenges to the uptake of off-grid applications of renewable sources. Many solar projects in rural areas fail because the consumers believe that solar energy is inferior to grid-based energy that is invariably produced from coal-fired power plants. Furthermore, some of the rural electrification projects are introduced without proper understanding of the local context.[89]

Studies indicate that in addition to economic considerations, culture and traditions have a fundamental effect on energy choices and consumption

---

[87] IPCC 5th Assessment Report (note 37 above) Chapter 3, 68 (footnotes omitted).
[88] Mendonça, Jacobs & Sovacool (note 6 above) 139 (evaluating factors that affect people's energy choices).
[89] Lang, Wooders & Kulovesi (note 46 above) 343 ('Renewable energy promotion cannot succeed without assessing local needs, adapting projects to meet those needs, and including local communities in project design.').

patterns, especially in rural areas.[90] The development of distributed energy projects especially in rural developing parts of the world including South Arica must be preceded by heavy awareness raising and campaigns to educate the consumers on the relative benefits of renewables in the social, cultural and financial context of the target community. The perception of fossil-based energy, as the key to development and a high standard of living is an obstacle that can only be dislodged by sustained education and awareness campaigns.

Some argue that this lack of awareness does not affect only rural consumers but also quite educated and 'informed' consumers of electricity and technocrats in urban and industrial areas.[91] The perception that only coal and nuclear power can support base-load needs must be deconstructed and it is possible to show that renewables can fulfil the base-load needs of energy consumers. Changing this requires careful planning of energy efficiency, consumption and the technology used in production and industrial processes.

However, any expectation that consumer choice can increase the use of renewable energy assumes the availability of such alternatives in terms of the structure of the electricity supply industry. In South Africa, the above arguments may not be helpful given the dominance of Eskom as a single buyer of renewable energy and pricing seems determined without reference to source of energy. Energy users are stark between two choices, either use Eskom supplied power or use own means (including solar installations and co-generation which are expensive for ordinary users). In the poor settlements and rural areas there is virtually no choice if there is no electricity supply, energy needs are provided from biomass and coal burning. Choice may be possible

---

[90] See generally, F Cottrell *Energy & Society: The Relation Between Energy, Social Change, and Economic Development* (2009); M Davis 'Rural Household Energy Consumption: The Effects of Access to Electricity: Evidence from South Africa' (1998) 26 *Energy Policy* 207-217; L Lutzenhiser 'A Cultural Model of Household Energy Consumption' (1992) 17 *Energy* 47, 57 et seq; L Lutzenhiser 'Social Structure, Culture and Technology: Modelling the Driving Forces of Household Energy Consumption' in JL Sweeney *et al* (eds) *Environmentally Significant Consumption: Research Directions* (1997) 77; W Poortinga, L Steg & C Vlek 'Values, Environmental Concern and Environmental Behavior: A Study into Household Energy use' (2004) 36 *Environment & Behavior* 70-93; and W Abrahamse & J de Groot 'The Psychology of Behavior Change: An Overview of Theoretical and Practical Contributions' in Fudge (note 85 above) 3.

[91] Lang, Wooders & Kulovesi (note 46 above) 341.

when it comes to buying electrical appliances and types of energy installations and consumables used such as light bulbs and geysers – this is where awareness is crucial.

3.3. The ethical challenge

The availability of cheap electricity from fossil fuels has engendered a sense of security, control and socio-cultural normality to consumers. Often that which we find socially comfortable is not always ethical. In environmental regulation there is often the contestation of what the human race regards as the purpose of conservation, while it is not quite clear if humanity has embraced the bio centric ethical ideology to care for nature for its own sake. Ethically, we usually see nothing wrong with the consumptive society that the human race has become – in fact that defines the ideal standard of living and quality of life.[92] Living close to nature at the lower subsistence level is now viewed as a sign of poverty and a people in that condition must be given access to energy, technology and modern goods. Persistence in the subsistence way of life could violate environmental laws. Such communities must now pay to hunt and to collect firewood and harvest biodiversity. The more energy one consumes the better and higher the standard of living. Even the Human Development Index shows that countries that use more energy have higher gross domestic product (GDP), gross national products (GNPs) and their index is generally high.[93] Is it ethical to premise the comfort of our race on unlimited energy use? Destroying the environment and critical ecosystems first by consumption and then by discharging wastes?

The ideology that has so far informed environmental and energy law is unsuitable to changing the mind-sets of society on energy choices. Energy and

---

[92] K Malik *et al Human Development Report 2013, The Rise of the South: Human Progress in a Diverse World* (2013) 34 ('Poor countries cannot and should not imitate the production and consumption patterns of rich countries').

[93] J Goldemberg 'Development and Energy' in AJ Bradbrook & RL Ottinger *The Law of Energy for Sustainable Development* (2005) 37, 42-43; J Klugman *Human Development Report 2010: The Real Wealth of Nations: Pathways to Human Development* (2010) 81; C Dasgupta 'Reflections on the Relationship Between the "Green Economy" and Sustainable Development' (2011) 20 UNCTAD The Road to Rio.

environmental law have since inception been embedded in an unnecessarily human-centred anthropocentric philosophy that puts the wants (not needs) and interests of people first among every other organism.[94] Energy language such as base-load, reliability, security of supply all betrays the anthropocentric ethical worldview that has shaped the existing regulatory frameworks. It is not impossible to think outside this centuries' old box and make a mixture of renewable energy sources replace the so-called base-load capacity.

The anthropocentric approach to energy and environmental regulation means that society expects the energy industry to think of how best to make the human race feel comfortable and in control of their energy needs. In energy law discourse, these sentiments are often clothed in talk of reliability and security of energy supply. Energy security is itself a dynamic but nebulous concept. Until recently energy security was not defined by reference to environmental sustainability, but only by reference to whether a particular resource is going to be reliably and continuously available to human beings.[95] Talk about the world running out of oil or coal is fearsome and society ethically feels bound to take self-preserving action.

From this perspective any shift towards renewables as supplements or even replacements of fossil fuels is not anchored in sustainability but in a human-centred desire to prepare for a future in the interests of human beings. This shows in the South African government's approach to renewable electricity where it is framed in terms of plugging the gap left by Eskom's capacity constraints. Thus IPPs are given space to enter the sector only to the extent necessary to ensure keeping the grid up in times of extreme demand, hence the limit and control of how much should be generated by IPPs. Outside the renewable energy procurement programme, the guarantees and incentives for renewable energy are not yet available.

---

[94] The NEMA s 2(2) ('Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably').
[95] Sovacool & Brown (note 3 above) 81.

It is submitted that dismantling the anthropocentric paradigm[96] and in its stead nurturing more of a bio centric ethical approach that respects the environment and ecosystems, could assist in behaviour modification and the energy choices that people make. Abrahamse and de Groot note that behavioural choices are determined by values, identities and social norms[97] and these are currently embedded in a human-centred value system. Maybe the emerging philosophy of earth jurisprudence[98] may provide a framework, but it is still to be clearly defined in the context of the needs of developing countries. Currently, it appears that energy choices are made on the wrong premises that have nothing to do with the environmental sustainability and conservation congruent behaviour.[99] A study has shown that the environmental footprint is one of the last things energy consumers worry about before they buy electricity or electrical appliances.[100] Cost appears to be the number one consideration, even when the NERSA is considering whether and how much to increase the price of electricity – the focus is mainly on cost and economic implications. Ethically, this removes environmental sustainability and resilience thinking from the decision-making processes. The ethical approach determines the extent to

---

[96] AA du Plessis 'Fulfilment of South Africa's Constitutional Environmental Right' LLD thesis, North West University, South Africa (2008) 38; W Scholtz 'The Anthropocentric Approach to Sustainable Development in the National Environmental Management Act and the Constitution of South Africa' (2005) 18 *Journal of South African Law* 69, 69-86; AA du Plessis 'Adding Flames to the Fuel: Why Further Constitutional Adjudication is required for South Africa's Constitutional Right to Catch Alight' (2008) 15 *SAJELP* 57, 63; S Pete 'Shuffling Deckchairs on the Titanic? A Critique of the Assumptions Inherent in the South African *Fuel Retailers* case from the Perspective of Deep Ecology' (2008) 15 *SAJELP* 103, 109.

[97] Abrahamse & de Groot (note 90 above) 4; see also de Jongh, D Ghoorah & A Makina 'South African Renewable Energy Investment Barriers: An Investor Perspective' (2014) 25 *JESA* 15, 17.

[98] Defined by JE Koons 'What is Earth Jurisprudence? Key Principles to Transform Law for the Health of The Planet' (2009)18 *Penn St. Envtl. LR* 47; for detailed analysis of earth jurisprudence see also C Cullinan *Wild Law* (2002); and P Burdon (ed) *Exploring Wild Law: The Philosophy of Earth Jurisprudence* (2011).

[99] R Spalding-Fecher *et al* 'The Economics of Energy Efficiency for The Poor - A South African Case Study' (2002) 27 *Energy* 1112.

[100] Mendonça, Jacobs & Sovacool (note 6 above) 139 ('One longitudinal study of attitudes towards energy and electricity found that, contrary to expected primacy of concerns about cost "comfort" was the single most important determinant of their energy use, an attitude so consistent that neither the location of those surveyed nor the year they were contacted changed the answer.'); referring to the study by LJ Becker *et al* 'Relating Attitudes to Residential Energy Use' (1981)13 *Environment & Behavior* 590-609.

which there will be social acceptance of particular energy sources, and that is still a problem with renewables, especially wind and solar.[101]

Alternative ethical approaches such as the ecological and bio centric approaches can properly frame an environment where the thinking about energy is shaped by the right values. A regulator, generator or consumer of electricity who takes an ethical view centred on humans as merely part of the ecosystem has potential to produce different decisions and choices. If people are not at the centre of our environmental concerns, then it should be possible and affordable to pay a huge price for electricity if that is the sustainable option.

Surprisingly, we refuse to see the threat of self-destruction that comes with the coupling of economic growth (development) and quality of life to insatiable consumption of fossil-generated energy. It is only now, with continuous talk of global warming and climate change that we are beginning to see how bad we have prepared for the energy future. Yet even this threat does not seem to be threatening enough to shift the values, identities and socio-economic norms that have hitherto informed our energy choices. Society gets an automatic reaction after conferences and when they read journal research and outcomes of the IPCC, yet as soon as they get home the unbearable need for comfort and control takes over the human mind.

The social and cultural attitude towards energy sustainability is a reflection of the generally apathetic attitude towards environmental problems and regulation. This is pronounced in developing countries like South Africa where widespread poverty and underdevelopment provide good excuses to deemphasise sustainable energy and low-carbon living. Acceptance and widespread use of renewable energy depends on a shift in these values and attitudes and how we use of natural resources generally.

---

[101] R Wüstenhagen, M Wolsink & MJ Bürer 'Social Acceptance of Renewable Energy Innovation: An Introduction to the Concept' (2007) 35 *Energy Policy* 2683-2691.

3.4. Institutional fragmentation and political conservatism

The social and behavioural challenges to the transition to renewable energy are compounded by institutional and governance structures that perpetuate and accommodate these attitudes. However, institutional fragmentation, conservatism, and political conservatism are in fact obstacles in their own right. The institutions that evolved with the fossil fuel industry have become so dominant that it is a mammoth task to remove, let alone reform them. Legitimised by the legal and governance framework, the energy institutions are interested in the dominance of the fossil fuels energy system.[102] By institutions one is talking of the government energy departments, regulators, utilities, financiers who, combined, make the energy system work. Structurally, these institutions are locked-in, in a cycle of mutual support and dependence that make it challenging to introduce new technology.[103] It has been argued that the incumbent state utility will hang onto its monopoly while allowing IPPs a peripheral or marginal role to plug the supply-demand gaps that occasionally arise during peaks.[104] It is in this context that law can be seen as a legitimising factor for fossil fuels.[105] Existing energy laws structurally support existing institutional design and energy governance structures, emboldening these institutions to be averse to new technologies and the institutional changes they require.[106] The state must remove institutional bottlenecks to grow the

[102] Edenhofer (note 5 above) 196; C Cullinan 'Earth Jurisprudence: From Colonization to Participation' (2010) *State of the World* 148 ('The rapidly intensifying challenge of climate change has exposed how ineffective international and national governance regimes are in dealing with the side effects of consumerism and the excessive use of fossil fuels.').
[103] Eberhard (note 48 above) 5309, 5316.
[104] Ibid.
[105] Outka (note 2 above) 1682.
[106] KN Gratwick & A Eberhard 'Demise of the Standard Model for Power Sector Reform and The Emergence of Hybrid Power Markets' (2008) 36 *Energy Policy* 3958 ('What we find in the power sectors of most developing countries often is a confused and contested policy and institutional space that arises from the fact that the incumbent state-owned utility remains intact and dominant, but where IPPs are also invited into the market, often with less than enthusiastic support from the incumbent. In many cases, the incumbent state-owned utility may at a later stage also start investing again in new generation capacity (or even if such utilities are not investing, many retain the desire to once again be involved in generation').

renewables market and wean state power utilities that perpetuate the current regulatory inertia.[107]

According to Kuni, the South African electricity sector revolves around the following institutions:

- Department of Public Enterprises (DPE): shareholder representative of government in Eskom.
- Department of Energy (DoE): mandated for policy and ensuring security of supply, also produces the IRP.
- Department of Finance: through the Treasury – providing Eskom guarantees for new build, R350-billion approved guarantees.
- Department of Water and [Sanitation]: published the Long Term Mitigation Scenarios (LTMS), which were incorporated into the IRP 2010 to reduce carbon footprint.
- Eskom: the incumbent monopoly utility owning the majority Gx, all the Transmission and System Operations (Tx) and owns parts of Dx not owned by municipalities.
- NERSA: responsible for price regulation and licensing of electricity activities.[108]

The Department of Minerals Resources must be added to this list given its national Constitutional legislative competence on energy. Energy legislation also creates key institutions such as the South African National Energy Development Institute (SANEDI)[109] and the Central Energy Fund (CEF).[110] Of these already too many institutions,[111] the Department of Energy has remained very dominant is shaping government policy on energy and renewable energy. This control is exercised directly and often indirectly through regulators who are

---

[107] WWS Charters 'Developing Markets for Renewable Energy Technologies' (2001) 22 *Renewable Energy* 221.
[108] D Kuni 'Roadmap to a Thriving Electricity Supply Industry in SA' (2012) 64 *Focus: The Journal of the Helen Suzman Foundation* 38, 40. Gx, Tx and Dx refer respectively to Generation, Transmission and Distribution of electricity.
[109] National Energy Act, Chapter 4 (s 7–16).
[110] Central Energy Fund Act 38 of 1977 as amended.
[111] B Praetorius & JW Bleyl 'Improving the Institutional Structures for Disseminating Energy Efficiency in Emerging Nations: A Case Study For Energy Agencies in South Africa' (2006) 34 *Energy Policy* 1520, 1528.

appointed by the Minister and often lack sufficient independence and autonomy.[112] Furthermore, control is exercised through Eskom, where the state remains the main shareholder. Due to lack of expertise in government and public institutions, most energy policy and regulatory matters are heavily influenced by what energy state-owned utilities think and propose, and what Treasury is prepared to financially guarantee. Thus for instance the ministry and Eskom have largely championed the REIPPPP. However, more worrying is that the state-centric institutions can work together well and IPPs could find it difficult to break into the sector with this web of mutually supporting state institutions.[113] Realistically though, it is also necessary to have institutional structures that can support the country's economy in the context of its socio-economic imperatives.

Other stakeholders include statutory advisory forums,[114] the private sector, and end-user associations as well as non-governmental associations and organisations especially in the renewable energy sector. Where relevant in terms of the Constitution, some provinces have provincial departments that mirror national ministries in areas of concurrent competences – which excludes energy.[115] The constitutional design of horizontal and vertical coordination of government departments could be a challenge to effective policy development and implementation. The Constitution provides for cooperative governance,[116] to promote the smooth running of government activities across the three spheres of government, and horizontally among departments at the same levels of government. Despite the constitutional principles of cooperative governance, the reality is that the spheres of government continue to play 'tug of war' over regulatory territory, revenue streams, and political space to the detriment of effective service delivery.[117] While 'energy' is an area of national competence[118]

---

[112] The initial regulators appointed under the original National Electricity Regulator Act were drawn from Eskom, see Eberhard (note 48 above) 5312.
[113] Pegels (note 4 above) 4953.
[114] ERA s 3.
[115] Energy and mining are national competences, therefore no provincial departments, while Water and Environmental Affairs cover an area of concurrent competence and provinces have similar departments.
[116] Chapter 3, s 40 - 41 of the Constitution.
[117] W du Plessis 'Legal Mechanisms for Cooperative Governance in South Africa: Successes and Failures' (2008) 23 *SA Public Law* 98; Fischer-Kowalski & Swilling (note 20 above) 92; This was illustrated by the *Maccsand* cases

several aspects of delivering energy transcend the three spheres of government. Thus air pollution, and electricity and gas reticulation[119] are areas of exclusive competence of local government or municipalities.

The Department of Energy, NERSA and Eskom (indirectly) are the three key national organs responsible for policy design and implementation in the electricity sector. Eskom, however, interacts with provincial and local government spheres when it comes to transmission and distribution of electricity. As noted in the previous chapter municipalities are key functionaries in the distribution of electricity.[120] The Department of Environmental Affairs is relevant as many of the activities required to successfully generate, transmit and distribute electricity are environmentally regulated and require various authorisations from the national, municipal or provincial environmental departments. The Department of International Trade is relevant because of the regional interactions that Eskom has when exporting or importing electricity. The Department of Minerals Resources is the trustee[121] and regulator of mineral resources including the major primary source of electricity, namely coal. How the ministry regulates coal mining has an implication on energy security and reliability as well as quality.[122] The standards set by the Department of Mineral Resources also potentially determine the level of pollution generated by coal power plants. For instance, a policy to restrict the export of high quality coal may mean less pollutants as local consumers are able to access the export grade high quality coal. Similarly, policies that promote export of high quality

---

[118] Not being listed in either Schedule 4 or 5 of the Constitution.
[119] Schedule 4 Part B of the Constitution.
[120] ERA s 27 providing for the functions and powers of municipalities including '(a) complying with all the technical and operational requirements for electricity networks determined by the Regulator; (b) integrating its reticulation services with its integrated development plans;… (d) progressively ensuring access to at least basic reticulation services through appropriate investments in its electricity infrastructure; (e) providing basic reticulation services free of charge or at a minimum cost to certain classes of end users within its available resources; (f) ensuring sustainable reticulation services through effective and efficient management and adherence to the national norms and standards contemplated in section 35;… (h) executing its reticulation function in accordance with relevant national energy policies; and (i) keeping separate financial statements, including a balance sheet of the reticulation business.'
[121] MPRDA s 3.
[122] MPRD Amendment Bill 2013 amending s 3 (Minister to have power to control export of minerals and strategic minerals).

coal may see increased use of low-grade coal with high sulphur content, which leads to more air pollution from power generation.

Except for the nuclear sector, NERSA are the central regulators of all the energy sectors in South Africa.[123] As regulators, NERSA is responsible for the economic, technical and access regulation of the electricity sector. In terms of economic regulation, NERSA adjudicates and determines rates and prices for energy carriers, it regulates the development and implementation of grid and distribution codes and technical standards at which the electricity system operates.[124] Lastly, it regulates and authorises activities that require licensing under the ERA,[125] among other energy legislation.[126] In regulating access, NERSA also has powers to control the type of primary carriers used to generate electricity and may require generators to use certain sources of energy.[127] The Minister of Energy appoints NERSA regulators hence the two are not strictly unrelated entities from a regulatory independence perspective.[128] The intricacies of the relationship between the ministry and the regulators are further elaborated on in Chapter 5.

While Eskom is not a government department, it is the state-owned electricity utility that is primarily responsible for generating, transmitting and distributing electricity in South Africa. Eskom generates over 96% while municipalities account for 1% and others including IPPs 3%.[129] It owns the transmission network and access to the network depends heavily on its cooperation.[130] Given its dominant position in the sector, Eskom has a decisive role in the design and implementation of numerous electricity energy policies such as the Master Plan, the IRP and energy efficiency and basic supply

---

[123] Established by the National Energy Regulator Act s 36 (regulators are appointed by the Minister in terms of s 5).
[124] ERA s 14 and 15.
[125] ERA s 7 and 9 (registration of unlicensed activities).
[126] NERSA is also the regulator of the liquid fuels and gas sectors under the Petroleum Pipelines Act and the Gas Act. A discussion of these sectors is beyond the scope of this study, which focuses on the electricity sector only.
[127] ERA s 34, Electricity Regulations on New Generation Capacity Regulation
[128] See Chapter 4.1 above.
[129] Department of Energy, *Electricity Pricing Policy (EPP) of the South African Electricity Supply Industry* GN 1398 in GG 31741 of 19 December 2008.
[130] L Kugel 'Review of the Regulatory Framework for Electricity Generation and Distribution in Southern Arica' USAID (2007) 43.

policies.[131] This power wielded by Eskom has serious implications on the potential of the private sector to enter the electricity sector.[132] For instance, the Build Programme aimed at implementing the IRP programme literally makes Eskom the champion of all fossil-based new generation capacity.[133] Even renewable projects all ultimately revolve around Eskom, as it is currently the buyer of any electricity generated by IPPs, at least until the single independent systems market operator becomes a reality.[134]

There is a high level of interdependence, domination, control and sometimes – manipulation between the public energy sector institutions. In this respect the national Department of Energy is in ultimate control. The Minister of Energy appoints all the NERSA regulators and determines their remuneration.[135] Similarly, as the sole shareholder of Eskom, the Minister of Public Enterprises controls the governance of Eskom.[136] This lack of functional independence of the NERSA and Eskom, while allowing the state to use these institutions to promote its developmental agenda, can seriously impede any intention to create space for the private sector. The peripheral institutions that indirectly regulate the electricity sector are often treated as 'other' regulators and denied space to properly regulate energy-related activities. The Departments of Energy, and Mineral Resources used to be a single department

---

[131] Ibid 42.
[132] Ibid 43.
[133] Section 17 the National Energy Act provides that the 'Minister may, for the purposes of ensuring security of supply, direct any state-owned entity, in a prescribed manner, to – (a) undertake security of supply measures; (b) provide for adequate investment in energy infrastructure; (c) invest in critical energy infrastructure; and (d) ensure upkeep of all critical energy infrastructure.'
[134] Kugel (note 130 above) 42; ISMO Bill proposes the independent buyer entity that will act as a clearing house of power produced by generators and sale it to consumers, but it has encountered legislative stasis. This would remove conflict of interest on Eskom being a generator and owner of the transmission system and currently acting as buyer to IPPs.
[135] National Energy Regulator Act 40 of 2004 s 5; this may change if the National Energy Regulator Amendment Bill, 2011 GN 890 in GG 34825 of 8 December 2011 ever becomes law. The Bill proposes to introduce in place of three regulators, a commissioner and three deputy commissioners as regulators. The Bill further proposes establishment of an appeals board to receive appeals against decisions by the regulators, which currently is not the case as appeals and reviews go to the High Court (s 10 (3) and (4)).
[136] Eskom Conversion Act s 6.

so their ties are still strong.[137] The Departments of Water and Sanitation and then Environmental Affairs remain the main 'other' key regulators of energy-related activities through environmental impact assessment processes, land use planning, pollution control and waste management.

The above institutional setup was developed to manage, regulate and enable an energy system powered by conventional fossil sources. This set up has conditioned the energy sectors from generation, transmission, and distribution that it is often thought that renewables cannot be integrated without major reforms and institutional reforms.[138] The history of fossil fuel use and the institutions and industries that developed around fossil fuels conditioned the legal environment to accept the status quo as inevitable.[139] Over decades the way utilities are regulated and the role of institutions led to structural vertical and horizontal integration in the electricity supply industry (e.g. Eskom controlling generation, transmission and distribution), that is difficult to dismantle given the fragmented approach to energy regulation. Outka thus rightly sums up that, '[s]tructural disadvantage for renewable energy are both harder to isolate and more intractable. These barriers are built into long-standing legal frameworks designed for a fossil-dominant energy sector and are the basic elements of the legal regimes that interface with energy production.'[140] These sentiments are generalizable to energy systems where the electricity supply industry is dominated by state-owned utilities established over long periods of time.

Renewable energy sources are seen as driven by environmental concerns including climate change. Energy institutions are strictly that, energy institutions focused on providing reliable and secure energy to consumers. The environment has been the least of their concern for centuries. To change the mind-set that still revolves around 'reliable' and 'cheap' fossils; sustainable

---

[137] The ministries were separated by President Zuma in terms of the transfer of administration and powers and functions entrusted by legislation to certain cabinet members in terms of s 97 of the Constitution, Proclamation 44 in GG 32367 of 1 July 2009.
[138] Pegels (note 4 above) 4953; Kugel (note 130 above) 45.
[139] This being the legitimizing and entrenching effect of outdated energy and environmental law as discussed in Chapter 3 and 4 above.
[140] Outka (note 75 above) 1697.

development and environmental institutions, must confront existing energy institutions. However, environmental law is itself still heavily fragmented .[141] The internal and external regulatory fragmentation means that renewables and institutions that drive them currently are seen as unstable, weak and therefore less of a threat to the established energy industry. This becomes clearer when one looks at the legal obstacles outlined in the next section.

Renewables are thus being developed and promoted in an institutional vacuum. Apart from a few IPPs and renewable energy associations, the South African government does not have a dedicated institution to champion renewable energy outside the Department of Energy or NERSA. In India, for example, they have a full ministry responsible for renewable energy while in South Africa the Department of Energy that has for many years been dealing with a fossil-driven industry and mineral resources is expected to champion renewables. The faith being shown in existing energy institutions and institutional structures is an obstacle to the transition to renewable electricity. The Department of Energy may not have the requisite pool of skills to support renewable electricity projects. Similarly, entrusting established energy utilities with the task of promoting renewables is also futile. What motivation does a utility such as Eskom have to promote renewables that could render all its existing fossil-based plant obsolete in a few decades?[142]

Arguably, asking existing energy utilities to champion renewable energy is a failed cause unless these utilities lead the renewable revolution.[143] If this is not going to derail the renewables project, it is still going to produce a long transition phase as utilities take time to adjust and position so that eventually they are also at the forefront of renewable technology. This is the most economically rational decision an existing player will take. This is not only limited to the electricity sector but permeates other energy sectors such as the transport sector. It is not in the interest of the established corporations such as

---

[141] W du Plessis 'Energy Law and Environmental Protection in South Africa' (2003) *Energy and the Environment* 103, 111.
[142] Kugel (note 130 above) 43.
[143] S Karekezi & T Ranja *Network African Energy Policy Research & Institute Stockholm Environment Renewable Energy Technologies in Africa* (1997) 139.

Shell BP, Chevron etc. to promote electric cars until they have technologically caught up. They cannot render themselves irrelevant by opening space to private players while they continue on the conventional path.[144] For the same reasons existing utilities will seek to retain the institutional set up.

The question of who regulates the energy industry and sets the rules of the game remains a relevant obstacle to renewable energy technologies. Standard setting, grid code design, pricing and rate setting techniques are all informed and grounded in an industry that knows no renewable sources. This is primarily why most studies and reports by existing institutions show renewables as being costly, expensive, unreliable and intermittent.[145] Most of the research and development in energy industry remains focused on greening conventional sources of energy. This institutional conservatism cannot be reformed without appropriate legal transformation of the energy industry first.

3.5. Legal and policy inertia: *The double-edged swords*

Uncertain, inconsistent, fragmented, complex, red tape, bureaucratic, impediment – are all words that have variously been used to define the impact of the existing energy and environmental laws on renewable energy.[146] When applied to renewable sources of energy, existing legal instruments[147] are a big obstacle.[148] Law and policy determine the entry, norms and standards, codes, costs and profitability of the electricity sector. Current law and policy grew out of, and in turn supports an energy industry intertwined with fossil fuels while

---

[144] Ibid 139.
[145] Ottinger, Mathews & Czahor (note 7 above) 19.
[146] Mendonça, Jacobs & Sovacool (note 6 above) 136; Outka (note 2 above) 1684 and 1691.
[147] This analysis is limited to main energy regulatory instruments such as the Electricity Act, the National Energy Act, Central Energy Fund Act, National Energy Regulator of South Africa Act, the Renewable Energy Policy White Paper, the Energy Policy White Paper, the Climate Change Response White Paper, Integrated Resource Plan 2 and the Energy Master Plan. These statutes have been analysed in Chapter 3 what this chapter is about is the extent to which specifically this set of existing legislation constitutes an obstacle to the shift towards renewable energy in South Africa.
[148] Edenhofer (note 5 above) 196 & 881; Y Omorogbe 'Promoting Sustainable Development Through the Use of Renewable Energy: The Role of the Law' in Zillman (note 3 above) 45 (law may inadvertently become an obstacle to policy).

mostly unsuitable for renewables.[149] It is relatively certain what procedures to follow and what criteria to apply to a proposal for a fossil-fired power plant than it is for a renewable energy project. The rules and specifications for generating, transmitting and disturbing fossil-generated electricity are more straightforward, while those for renewables are at best vague and at worst non-existent.

From a policy perspective, the current approach expects renewable energy to fit into the existing legal and policy environment or else develop in a regulatory vacuum. Reforming the regulatory environment means extricating the legal framework from a 'carbon lock-in' caused by the dominance of fossils.[150] As Shapiro and Tomain argue, 'environmental advocates contend that the magnitude of current problems is greater than it would be if there were more effective laws and enforcement.'[151] The reform of energy law to shift away from orthodox models of regulation is necessary to unlock the potential of renewable energy technologies or sources. However, most attention has been paid to economic and technological feasibility, while the legal framework necessary to implement renewable technologies has largely been forgotten.[152] The absence of legal research, and of a dedicated renewable energy law is thus a barrier to the transition to an energy mix with more renewables.

Since renewable energy is considered expensive and costly,[153] it requires huge funding, and to get such funding financiers need legal certainty to secure their investments. Similarly, private sector IPPs also need certainty that once they sink their investment they will have buyers offering a reasonable rate of return. Empirical surveys show IPPs bemoaning lack of certainty in terms of legal rights and obligations. One survey showed that:

> investors did not believe that the political climate was conducive to substantial investment in this industry. The reasons are a lack of clear regulations and government support, a preference for conventional fossil fuel based energy,

---

[149] Edenhofer (note 5 above) 881-2.
[150] GC Unruh 'Understanding Carbon Lock-in' (2000) 28 *Energy Policy* 827 ('This condition, termed carbon lock-in, arises through a combination of systematic forces that perpetuate fossil fuel-based infrastructures in spite of their known environmental externalities and the apparent existence of cost-neutral, or even cost-effective, remedies.').
[151] Shapiro & Tomain (note 5 above) 502.
[152] RL Ottinger 'Legal Frameworks for Energy for Sustainable Development' in Bradbrook & Ottinger (note 93 above) 103.
[153] Edenhofer (note 5 above) 194-5.

> and the use of political forces to shape the energy industry with the government's own monopoly.[154]

These fears are confirmed by other recent empirical studies,[155] that all point to the necessity for legal clarity in regulation. IPPs fear the continued dominance of the Eskom which relies on abundant cheap coal; while financiers fear their investment may not be secure. Aggravating the whole situation, regulators and government departments fear the prospect of being blamed for anything that may go wrong with a rushed or poorly planned transition to renewables.

One of the most difficult challenges faced by renewable energy is gaining the support and confidence of politicians who ultimately make law and policy and head the responsible government. Political commitment must be informed by a political paradigm shift from the traditional regulatory state approach.[156] This applies with equal force in South Africa where there is consistent prevarication from renewables to nuclear, back to coal and sometimes natural gas, from one incentive tool to the other with no long-term policy clarity.[157] The government is torn between welfarism to address historical injustices, and the need for sustainability and measures to address the climate challenge.

In South Africa the legal and policy environment for energy analysed in Chapter 4 remains uncertain and fragmented. However, viewed from the perspective of the fossil fuel lobby this legal environment is normal and continues to promote conventional sources of energy. For a generator who seeks to deploy coal it is straightforward, while if one is coming in as a green low-carbon power generator you are in for a nightmare. The policy environment has been shaped by the conventional energy sources industry to the extent that the state utility Eskom has been instrumental in designing part of the policy environment.[158]

---

[154] de Jongh, Ghoorah & Mamina (note 97 above) 20.
[155] A Eberhard & KN Gratwick 'IPPs in Sub-Saharan Africa: Determinants of Success' (2011) 39 *Energy Policy* 5541-2; Pegels (note 4 above) 4953.
[156] C Mitchell The Political Economy of Sustainable Energy (2008) 2.
[157] S Nel 'Transforming the Energy Supply Industry' (2012) 64 *Focus: The Journal of the Helen Suzman Foundation* 15 and 21; Lloyd (note 17 above) 12.
[158] Eberhard (note 48 above) 5309, 5317.

The National Energy Act of 2008, being recent, shows more serious policy intent on promoting renewable sources of electricity, yet the ERA does not appear to be fully grounded in sustainable energy ideology, which informs the National Energy Act. Even then, it has been argued that the final version of the National Energy Act does not fully implement the Renewable Energy White Paper especially its ambition to promote targeted shift towards renewable energy sources.[159]

The Integrated Resource Plan (IRP 2), which is the blue print for South Africa's future energy trajectory, shows the heavy influence of the fossil fuels industry. The strategic vision and targets in the plan indicate that fossil-based energy is regarded as indispensable in South Africa.[160] The IRP 2 revises down the renewable electricity targets relative to targets set in 2003 in the Renewables Energy White Paper. An expanded role is envisioned for nuclear energy,[161] which was not a key feature even in the Energy Policy White Paper in 1998. The IRP 2 is crucial as it also shapes the investment and financing mood nationally and internationally, thus no economically rationale investor will put funds into renewables when the role of this source in South Africa's energy mix is diminishing and projected to remain on the periphery until 2030.[162]

Be that as it may, recent years have seen earnest attempts on the part of the Department of Energy and NERSA to reform the legal and policy environment so that it is not *per se* an obstacle to renewable sources of electricity.[163] These attempts have not always been successful or smooth as we are dealing with new technologies. Use of different incentives is necessary

---

[159] J Glazewski & L du Toit (eds) *Environmental Law in South Africa* Service Issue 2 (2014),18–26 and 18–29 (noting that provisions that mandated the Minister promote renewable energy and energy efficiency in the Bill were removed in the final Act).

[160] According the 'peak-plateau-decline' emission trajectory in the LTMS and the Climate Change White Paper.

[161] L Faull, S Sole & S Brümmer 'What the SA-Russia Nuke Agreement says - and Means' *Mail & Guardian* (13 February 2015); L Faul 'Exposed: Scary Details of SA's Secret Russian Nuke Deal' *Mail & Guardian* (13 February 2015).

[162] National Development Plan (2011) 165 <http://www.npconline.co.za/pebble.asp?relid=25>

[163] Passing of New Generation Capacity Regulation (2012), FITS Guidelines, amendments to ERA, NERSA Acts, opening of the renewable energy independent bidding systems in 2012.

when dealing with new technologies,[164] However, the policy and regulatory radars change focus quickly and without indications of long-term future direction. This does not bode well for renewable energy given the long-term financial return cycles. Pegels argues further, regarding the single buyer model dominated by Eskom, that:

> [h]owever, as long as only the monopolistic electricity supplier Eskom is allowed to buy the electricity produced from renewable energy sources, there is considerable uncertainty among renewable energy project developers. Reliability of profits as the most important incentive of the feed-in-tariff scheme is lacking.[165]

Like all other inventions commercialisation takes time and investment.[166] To see the real financial benefits of some renewables requires long periods in an environment where an independent buyer mediates among generators and distributors. Despite these doubts and gaps, the REIPPPP has produced some preliminary good indications.[167] One hopes that the IPPs did not underbid which may result in some of them failing to generate energy at the bid prices.

The key renewable energy policy document is the Renewable Energy White Paper of 2003, which provides for policy goals, strategies and objectives. Then the IRP 2 and LTMS are important recent policy documents developed from statutory mandates. An analysis of these policies collectively shows that they are fraught with policy uncertainty and shifting visions. Recent pronunciations by the relevant minister on the role of nuclear energy confound matters further, especially for IPPs.[168] It is not clear whether government is serious with the renewable energy-bidding programme or whether they foresee

---

[164] Lloyd (note 17 above) 1, 12 ('There is a lack of clarity about the REFITs – the IRP 2010 process involved competitive bidding, but details of the bidding process and whether they include REFITs are unknown.'); Pegels (note 4 above) 4951; H Masondo & G Nott 'The Bid for Private Power: Energy Law' (2011) 11 *Without Prejudice* 55–7.

[165] Pegels (note 4 above) 4951.

[166] Mendonça, Jacobs & Sovacool (note 6 above) 127.

[167] A Eberhard, J Koeller & J Laigland 'South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons' (2014) 30-33.

[168] Speech by the Minister of Energy, Ms Dipuo Peters, MP, on the occasion of the Youth Round-Table on Nuclear Energy (13 June 2013) <http://www.energy.gov.za/files/media/speeches/2013/SpeechByMinisterYouthRoundTableOnNuclear-13June2013.pdf >; P Vecchiatto 'Peters Sings Praises of Nuclear Energy' *BusinessDay* (14 May 2013) < http://www.bdlive.co.za/business/energy/2013/05/14/peters-sings-praises-of-nuclear-energy>

nuclear taking over from coal in the future.[169] The targets proposed in the White Paper have shifted over time from policy to policy and the role of each source of electricity has also changed with the revisions of the different policy documents. Environmental policy sends its own signals on the role of renewables and strategies to address climate change, while specific energy policies are focused on short-term reliable supply from the most affordable sources, namely coal, gas and nuclear. The unexpected shift from the FITs to REIPPPP also shook the confidence of private sector investors interested in renewable electricity.[170] However, the REIPPPP has had a measure of success in providing a framework for IPPs to enter the renewable energy sector. It remains to be seen though how successful the implementation will be, once the successful bidders complete the preparatory work.

Legal frameworks premised on sustainable development would address these problems given the long-term focus of sustainability. Promoting renewable energy in the current legal environment, places this challenge in the path of renewables. It has rightly been argued that the reformed laws remain fragmented and ignore the full production cycle of conventional sources of energy.[171] Because this framework entrenches the fragmented approach, addressing the barriers discussed in this chapter remain a challenge. Shifting towards integrated environmental management and regulation without integrating energy regulation may cause regulatory misalignment that could potentially obstruct renewable energy growth in South Africa. In this regard Outka notes:

> Even as environmental law constraints the damage that would result absent environmental controls, its structurally reactive posture preserves the primacy of polluting legally with a permit. This provides a structural advantage for fossil energy relative to non-polluting alternatives that receive no similar compromise simply because their inherent qualities do not require it.[172]

---

[169] S Thomas 'Economics of Nuclear Energy' (2012) *Focus: The Journal of the Helen Suzman Foundation* 53-54.

[170] 'This IPP Procurement Programme has been designed to procure the target of 3,725 megawatts and to contribute towards socio-economic and environmentally sustainable growth, and to start and stimulate the Renewable Energy industry in South Africa.' IPP Request for Bids (2012).

[171] Du Plessis (note 141 above).

[172] Outka (note 75 above) 1702.

Under certain circumstances law presents obstacles to the deployment of renewable energy sources. By entrenching and legitimising conventional sources of energy, energy law and policy create a regulatory environment that alienates renewables and distorts the perceptions around their feasibility and reliability. Laws and policies designed out of the fossil energy industry are not ideal enablers of the transition to low-carbon energy sources.

Energy and environmental laws in particular legitimise fossil fuels by firstly tolerating the negative impacts of these sources through permitting processes that set acceptable levels of pollution. Second, the laws and policies sometimes do not provide for an energy mix where diverse sources are envisaged leaving alternative sources of electricity unregulated and difficult to deploy. Third, in economies where energy utilities are state-owned monopolies the law and policies become inextricably intertwined with the knowledge, operations and design of the energy system throughout from generation, transmission, distribution to rate determination and pricing. The law, as it were, begins to revolve around the fossil fuel industry and the monopolies, while the industry itself becomes one with the legal framework. The consequences are that breaking into this industry and market is near impossible for the private sector without sustained state intervention. Barriers to entry are the result of the system design and the legal and policy environment for the electricity sector. Lastly, the existing energy and environmental laws have operated over a long time and are tested reliable and usable to the conventional energy industry.

This legal framework must be reformed into one that fully acknowledges the role of diverse sources of energy, including renewables on equal footing with conventional sources. The licensing process and tariff principles must reflect the intention to incorporate electricity generated from renewable sources.

The absence of a global, transnational and regional policy for renewable energy makes domestic regulation problematic. This is particularly the case when global environmental problems such as climate change and global warming are among the key drivers of renewable energy sources of electricity. A global approach to regulation is necessary to promote the strategies deployed at the domestic level to promote renewables. There is currently no global

framework for renewable energy apart from some scattered regional instruments (Energy Charter Treaty, International Energy Agency (IEA), some United Nations initiatives, but not legally binding frameworks). A global approach is necessary, especially where global institutions such as the UN have shown that, there is a causal link between sustainable energy and development (Millennium Development Goals (MDGs) and human well-being.

3.6. Conclusion

The reasons advanced for the continued dominance of conventional sources of energy are all not insurmountable. Financial and economic barriers are the result of lack of full cost accounting for the production of energy from fossil fuels, largely due to subsidisation (direct or indirect) by the government through the state owned monopoly. While persuasive arguments abound on why renewable energy is likely to promote sustainable development and sustainability, a number of obstacles exist that make it costly, unsustainable and sometimes uneconomic to drastically shift towards renewable energy. There are still technical challenges regarding the infancy of some renewable technologies, while for those that have been commercialised there are still high cost implications particularly in relation to the established fossil fuel industry against which the new sources have to compete. An enabling legal framework can create economic instruments to address both legal and economic barriers.

Most consumers are not able to make informed energy choices due to lack of awareness. The social and behavioural environment has not developed to such a degree as to enable a transition towards an energy system allowing a bigger role for renewables. This contrasts sharply with the developed countries where renewables have made significant breakthrough (German and Spain[173] for example). The false sense of security in coal and nuclear power remains intact in South Africa, continuously moulding the socialisation of energy and how consumers make decisions about energy consumption. Changing

[173] A Ciarreta, MP Espinosa & C Pizarro-Irizar 'Is Green Energy Expensive? Empirical Evidence from the Spanish Electricity Market. (2014)69 *Energy Policy* 205, 206.

economic behaviour requires changes in the governance framework to create security in renewables or the perception thereof at least.

The fossil fuel industry cannot be dislodged or wished away overnight without properly thought-out strategies to address the shocks likely to result from a transition to renewable energy. The institutional and economic structures from the fossil energy revolution still dominate. These pose serious challenges to renewable energy uptake. Deciding who ultimately regulates the energy industry, who sets norms and standards, grid codes, and the rules of the game is fundamental to the successful adoption of renewables. Renewable energy sources are still to become socially, culturally and ethically acceptable to many communities who are accustomed to fossil-based energy. Despite the attractiveness of renewable energy one bears in mind the caution by Shapiro not to rush the reform of electricity markets lest the country opens itself to calamitous repercussion, as happened in California.[174]

The challenges and barriers identified in this chapter also define the South African renewable energy sector and the country has a mammoth task to clear these barriers through legal, economic and other policy strategies. Overall, this chapter demonstrated that the best approach is to address the legal and policy barriers first. This is likely to enable the government and industry to confront the other technical, economic, social and institutional challenges. Legal and policy interventions can quickly create a framework for rights and obligations and set a certain environment for investors and industry players who can implement renewable energy projects without hesitation. At the same time the legal and policy strategies must be properly contextualised and situated in the social, economic and political environment of South Africa to enable effectiveness and compliance.

---

[174] Shapiro & Tomain (note 5 above) 497; Helm (note 23 above) 16; C-K Woo 'What Went Wrong in California's Electricity Market?' (2001) 26 *Energy* 747, 756 ('What can we learn from the California experience? The answer is that if electricity market reform is not done in an environment of surplus capacity, many sellers and easy market entry, it will not yield the desired outcome of reliable service at low and stable prices... Finally, as a caution it must be mentioned that electricity market reform is highly risky and irreversible. Once the power plants owned by the formerly integrated utilities are divested, it is nearly impossible, to turn back. The California experience suggests that a reversible regulatory reform is a safe alternative to an irreversible market reform.').

A number of instruments have been developed worldwide to address the barriers to renewable energy.[175] In Chapter 6, I analyse the extent to which South Africa has developed and implemented some of these strategies, with reference to the legal and policy obstacles. An evaluation of the interventions in light of the barriers analysed in this chapter enables us to develop propositions and recommendations of what are the best strategies to develop renewable energy in South Africa and the challenges that could be encountered in implementing them. However, before discussing the responses to barriers it is important to undertake the existing energy and environmental legal framework and how it affects the transition to renewable energy in South Africa.

[175] IPCC (note 37 above); Chapter 3, 46, 2014 ('A broad range of policy instruments for climate change mitigation is available to policymakers. These include economic incentives, such as taxes, tradable allowances, and subsidies; direct regulatory approaches, such as technology or performance standards; information programs; government provision, of technologies or products; and voluntary actions.').

Chapter 4
Regulatory Framework for Energy

4. Introduction

The energy problems confronting South Africa are by now clear and equally the obstacles inhibiting the increased use of renewable sources have been highlighted in the preceding Chapter 3. In this Chapter the existing energy legal framework is analysed with specific reference to two aspects, firstly how it affects energy practices and secondly whether and how it can promote renewable energy. By way of an overview the energy sector and electricity supply industry of South Africa has been regulated for a long time beginning with the Electricity Act 41 of 1987, repealed by the current Electricity Regulation Act 4 of 2006 (ERA) except s 5B, which has remained in place and governs the Fund of the Regulator.[1] The Minerals and Petroleum Resources Development Act 28 of 2002 (MPRDA) regulates all mining activity including the mining of primary energy sources. The National Energy Regulator of South Africa Act 40 of 2004 governs the institutional aspects and establishes a regulator for electricity, gas, petroleum and nuclear (generation aspects only) energy. The Gas Act 48 of 2001 regulates the gas sector while the Petroleum Products Act 120 of 1977 and the Petroleum Pipelines Act 60 of 2003 regulate the liquid fuels sector. The Nuclear Energy Act 46 of 1999 and the National Nuclear Energy Regulator 47 of 1999 govern the nuclear energy sector. An overarching energy statute came in the form of the National Energy Act 34 of 2008, which promotes integrated regulation and provides for overarching principles governing the energy sector as a whole. Various scholars have described this energy law framework.[2]

The discussion in this chapter assumes a rudimentary knowledge of these energy laws hence the preference for an analytical approach as opposed

---

[1] The chronology and evolution of South Africa's of energy legislation is ably dealt with by J Glazewski & L du Toit (eds) *Environmental Law in South Africa* Service Issue 2 (2014) 18-29 et seq, and W du Plessis 'Energy Law' in R Blainpain (ed) *International Encyclopaedia of Energy Law* (2006) (updated by Supp. 48 (2015)).

[2] For further detailed treatment of these South African energy laws see the following texts: Glazewski & Du Toit, ibid, 18-28 to 18-41; HA Strydom & AD Surridge 'Energy' in H Strydom & N King *Environmental Management in South Africa* 2nd ed (2009) 797 *et seq*; R Stein & KB Omidire 'Energy' in *Law of South Africa* Volume 9 (Cumulative Supplement 2015) and recently published subsequent to this study A Klees *Electricity Law of South Africa* (2014).

to descriptive narratives of the energy legislation that can be found in the authorities cited herein. Nevertheless, the analysis in this Chapter considers the interaction of energy policy and law with climate change and integrated energy planning while describing the state of existing energy laws. Broader policies expressed through white papers are discussed first and an analysis focusing on electricity sector laws follows to evaluate the extent to which the policy documents have influenced the development of hard laws since they were developed in 1998, 2003 and 2011. Included in this analysis is a discussion of how emerging climate change policy may present an opportunity to promote renewable energy. Part 4.4 deals with the mining legislation as it relates to primary energy resource extraction. Thereafter Part 4.2 deals with the energy policy environment to foreground the analysis of the actual energy laws in Part 4.3. Part 4.4 lastly focuses on integrated energy planning followed by the conclusion.

4.1. Regulation of the energy industry in South Africa

The energy industry of South Africa is big and spans several sectors, ranging from electricity, transportation, industry, domestic and agricultural sectors. It is impossible in a study of this nature to look at all the sectors without diluting the depth of the discussion. Hence, this study is delimited to focus on the electricity sector for reasons discussed in Chapter 2.1, namely that the electricity sector contributes most to GHG emissions and is a critical challenge in South Africa. Being the biggest contributor to environmental degradation it makes sense to direct regulatory interventions to this sector.

The study focuses on the primary and secondary sources of energy, which is unique as most studies often focus on electricity forgetting that greater damage is done in extracting primary sources of electricity, mainly through the mining process. Other energy sectors are important and they are all connected, yet in the context of global environmental problems and the role of the energy in the South African economy, it is the industry where major shifts can occur.

4.1.1. Regulating primary sources of energy

Laws that regulate both primary and secondary sources of energy are included in the definition of energy law in this study,[3] although, this study is limited to the electricity sector.[4] Such a study will be incomplete without analysing the primary sources of energy broadly. Tomain argues, '[e]nergy laws, policies, and regulations, then, should not ignore the environmental effects that occur throughout the fuel cycle. However, for nearly four decades, energy and environmental laws have been treated as separate disciplines and have been largely uncoordinated.'[5] The legislation that regulates the extraction or mining of primary sources of energy such as coal and uranium is also discussed. This aims to highlight the tangent at which these laws operate in relation to environmental laws. A further reason why mining legislation is regarded as part of energy law in this study is that the stage of primary resource extraction is the level at which sustainability should be mainstreamed into the coal value chain. To date, research on the strategies of promoting renewable energy focus too exclusively on electricity as a secondary source of energy and the energy market, ignoring that the primary driver of that secondary sector and the market is the primary energy industry – mining.[6]

In South Africa, energy, including renewable energy, is regulated through sector-defined legislation noted in the introduction. Various statutes govern liquid fuels, nuclear energy, electricity, gas and the mining of primary energy sources; hence mining legislation is part of energy legislation.[7] There is also a set of institutional statutes establishing national institutions for the energy

[3] While current energy legislation does not incorporate the cradle-to-grave principle, the study argues that any legislation that deals with the extraction, production and processing of primary energy sources is in fact 'energy law' and plays a potential role in the green transition.
[4] This encompasses generation, transmission and distribution and focuses on aspects of these processes that are relevant to renewable energy only.
[5] JP Tomain *Ending Dirty Energy Policy: Prelude to Climate Change* (2011)12-13.
[6] A lot of the research on electricity in South Africa referenced throughout this study does not refer to linkages between coal mining and electricity supply.
[7] See note 1 above.

industry.[8] It is at this primary level that regulators should begin to address the impediments to revolutionising entrenched primary sources of energy.

This approach is ideal as it comports with the argument that environmental regulation enters the energy production chain at the wrong stage, namely only to control emissions.[9] Environmental law does not rigorously regulate the extraction and processing of primary resources for energy in terms of directly regulating how and in what quantities, the primary resources are exploited. Wildermuth, writing generally, concludes that such a 'waste-only approach has immense implications for energy use. This means that environmental law is largely unconcerned with the sources used to generate energy. It never requires an examination of the whole process.'[10] Clearly therefore, from the perspective of regulating energy sources to promote renewables, environmental law is oblivious to the regulation of the extraction of coal and gas and uranium, apart from the EIA process.

Perhaps the assumption is that mining law must address that phase, while energy law regulates aspects of generation and production stages. This is the quintessence of the detachment of energy law from environmental law. In South Africa, recent efforts to subject primary energy sources extraction activities to environmental regulation are gaining traction, despite the hegemonic intransigence of the extractive industry supported by the Department of Mineral Resources.[11] A brief look at the main primary energy carriers (sources) in South Africa supports this contention.

---

[8] National Energy Regulator of South Africa Act 40 of 2004; Central Energy Fund Act 38 of 1997 as amended, National Nuclear Regulator Act 47 of 1999 (NNR), National Energy Act 34 of 2008 (SANEDI).

[9] AJ Wildermuth 'Is Environmental Law a Barrier to Emerging Alternative Energy Sources?' (2010) 46 *Idaho LR* 509, 528; AJ Bradbrook 'Energy Law: The Neglected Aspect of Environmental Law' (1993) 19 *Melb. U. LR* 1, 3 ('Environmental law has traditionally focused on the adverse effects of energy use, but has largely ignored the energy source itself.').

[10] Wildermuth, ibid 528.

[11] The intransigence is illustrated by the department's position in *Maccsand (Pty) Ltd v City of Cape Town* 2012 (4) SA 181 (CC) and *Le Sueuer & others v Ethekwini Municipality* HC Durban 2013, the Mapungubwe CoAl Africa case, and failure to complement Environmental Affairs in synchronising the NEMA and MPRD Amendment Acts until coerced by circumstances; TL Humby 'The Environmental Management Programme: Legislative Design, Administrative Practice and Environmental Activism' (2013) 130 *SALJ* 60.

4.1.2. Regulation under the Minerals and Petroleum Resources Development Act

Over 98 per cent of electricity in South Africa is generated from coal.[12] Domestically, electricity generation gobbles most of the coal mined in South Africa. It is crucial to understand how, if at all, environmental law affects the mining and production of coal. Discouraging heavy reliance on coal through environmental disincentives could promote alternative or renewable energy sources. The mining of coal is not only driven by the local energy industry, but also by a thriving export economy.[13] Dislodging fossil fuels therefore has serious implications for the South African economy. If environmental law unduly controls the mining of primary sources of energy, that may damage the economy and industries that rely on the coal value chain. To address the social and economic consequences of displacing the fossil fuels mining industry, the renewables industry must provide substitute economic opportunities by creating more jobs.[14]

There is no dedicated legislation for the mining of coal and gas in South Africa.[15] The MPRDA is the primary law for all mining and exploration activities in South Africa. The MPRDA thus regulates the mining of coal, uranium, natural gas, and petroleum drilling. A detailed study of the regulation of mining rights and the mining process is not the concern of this study. The objective is to analyse the MPRDA to assess the extent to which it entrenches the expeditious extraction of primary fossil fuels and how this, directly or indirectly, undermine renewable energy sources? In the context of this chapter, how does the MPRDA perpetuate the reliance on fossil fuels and thereby hinder the transition to renewable energy in South Africa?

---

[12] C Van Horen et al 'Energy, Environment and Urban Poverty in South Africa' (1993) 21 *Energy Policy* 623, 623; Department of National Treasury 'Reducing Greenhouse Gas Emissions and Facilitating the Transition to a Green Economy: Carbon Tax Policy Paper' (2013) 9.

[13] A Eberhard 'The Future of South African Coal: Market, Investment, and Policy Challenges' *Programme on Energy and Sustainable Development* (2011) 4 and 25.

[14] Among other reasons, President refused to sign the MPRD Amendment Bill 2013 in January 2015 due to the proposal to declare certain mineral resources (coal especially) as strategic and impose export quotas.

[15] du Plessis (note 1 above).

The MPRDA is a revolutionary law, especially how it reorganises the mining industry in South Africa. The Constitutional Court further recently confirmed that the MPRDA is among the environmental legislation contemplated by s 24(b) of the Constitution of South Africa – to the extent that it is aimed at promoting sustainable development in the mining industry.[16] However, the bad reputation of the mining industry as the most environmentally unfriendly defies this constitutional logic. Whether or not the MPRDA fits into a regulatory framework for energy, viewed from the perspective of the promotion of renewable energy, is the question.

The critical issue is whether the MPRDA has any provisions that could be interpreted as promoting social, economic, and environmental sustainability in the mining sector, by constraining fossil resource extraction. The MPRDA provides for the application of the NEMA principles of environmental management to all mining activities.[17] In particular, since 2014, every applicant for prospecting and mining rights must comply with the requirements of conducting an environmental assessment as provided for in the NEMA.[18] This One Environmental System however only integrates mining and environmental regulation.[19]It does not deal with the MPRDA as an energy issue. In addition to complying with NEMA environmental authorisation procedures, before issuing a prospecting or a mining right the Minister must be convinced that the mining 'will

[16] *Maccsand (Pty) Ltd v City of Cape Town* 2012 (4) SA 181 (CC) para 5; *Agri SA v Minister for Minerals and Energy* 2013 (4) SA 1 (CC) para 26.
[17] MPRDA ss 37.
[18] Ibid s 38A (2) read with ss 19(2)(e), 25(2)(e); Humby (note 11 above). This process was brought into effect by the Mineral and Petroleum Resources Development Amendment Act 49 of 2008 which came into force in August 2014. This amendment repealed the internal environmental management provisions formally in the MPRD Act and subjected listed mining activities to the environmental authorization regime under the National Environmental Management Act under the so-called One-Environmental System analysed in detail by T Humby 'One Environmental System: Aligning the Laws on the Environmental Management of Mining in South Africa' (2015) 33(2) *Journal of Energy & Natural Resources Law* 110, especially at 123 (explaining the process leading to the 2014 final legal amendments). While an encouraging achievement, in practice, this system is still new and has not had any observable impact.
[19] That is, it does not necessarily cure the fragmentation between energy and environmental law.

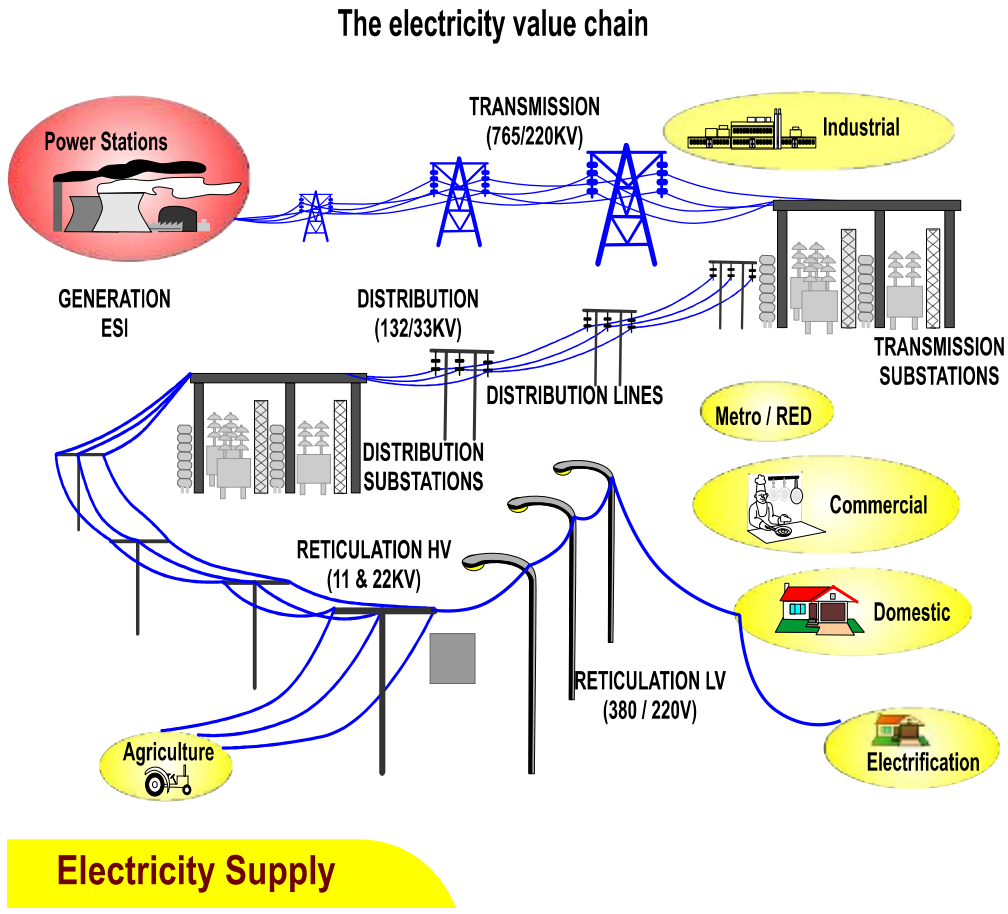
not result in unacceptable pollution, ecological degradation or damage to the environment.'[20]

In addition, the holder must comply with any other relevant laws, such as the National Water Act, the Air Quality Act, the National Environmental Management: Waste Act, the National Environmental Management: Biodiversity and Protected Areas Acts, and other applicable national and provincial land-use planning legislation.[21] Recently, the courts confirmed that the holder of rights under the MPRDA must comply with local and municipal zoning and planning regulations to the extent that mining is not expressly exempted, and the targeted land is within the municipal boundaries.[22] The 'pollution' referred to in section 17 (1) and 23(1) is the immediate impact of the mining process not the secondary pollution caused when the mined resource is used later in the energy value chain e.g. when coal is burnt to produce electricity.

The Department of Energy's electricity value chain (Figure 3) demonstrates this incomplete regulation – starting at generation rather than mining. The value chain diagram clearly shows that as far as the Department of Energy is concerned what happens to produce primary sources for electricity generation is not their concern. The mining and its impacts are ignored by the energy department presumably that other government departments will look after that. This is the quintessence of fragmentation and lack of alignment. It also illustrates the distortions in the accounting and costing of the electricity produced as it excludes the social and environmental costs of producing primary source (coal).

[20] MPRDA ss 17(1)(c); 23(1)(d).
[21] Ibid ss 17(6) and 23(6) applied in *Maccsand*.
[22] *Maccsand (*note 11 above); *Sueuer (*note 11 above*)*; *Mtunzini Conservancy v Tronox KZN Sands (Pty) Ltd & another* (10629/2012) [2013] ZAKZDHC 1 (8 January 2013).

Figure 3 Source: Adapted from a Department of Energy Report, South Africa, 2007



The MPRDA environmental management provisions are criticised for being too dogmatic and technical, lacking a substantively sustainability-grounded approach.[23] Case law indicates the serious contestation between the MPRDA and environmental and planning laws, both at the national, provincial, and local levels. This contestation is a clear manifestation of the disjuncture between South Africa's energy and environmental laws.[24] However, more concerning is the failure by the MPRDA to regulate the use of fossils in energy generation apart from baldly stating that its object is to promote sustainable use. Arguably,

[23] Humby (note 11 above) 60, 64-65, 85-86.
[24] See cases cited in note 11 above.

sustainable use could entail regulating unsustainable uses of minerals in downstream industries like the electricity sector by closely complementing energy and pollution control laws.

Over several coordination activities, the departments then responsible for Minerals and Energy, on the one hand, and the Environment department on the other, have tried to resolve their differences by developing a synchronised regulatory process.[25] The ministers concluded Memoranda of Understandings and agreed to amend their respective legislation, but ultimately nothing came of this alignment process, which was revived with renewed vigour in 2013. In 2008, the Minister of Environmental Affairs kept her part of the bargain by amending the NEMA[26] to ensure a smooth EIA process for listed mining activities.[27] On the other hand, the then Minister of Minerals and Energy produced a Bill,[28] which Parliament enacted, but was never brought into effect until forced in 2014. This after, the Minister of Minerals had gone back to the drawing board and came up with a super Bill to clean up the entire MPRDA. The result is the 2013 MPRDA Amendment Bill,[29] which President Zuma refused to sign into law and returned to Parliament for further consultations. The

[25] Joint presentation by the departments of Minerals, Environmental and Water Affairs to the Mining Portfolio Committee (10 September 2013) <http://www.pmg.org.za/report/20130911-mine-environmental-management-briefing-departments-environmental-affairs-and-minerals>.
[26] National Environmental Management Amendment Act 62 of 2008.
[27] Mining activities are listed as Items 17-21 Environmental Impact Assessment Regulations Listing Notice 2 of 2014 GN R984 in GG 38282 of 4 December 2014, and previously Items 20-23 in the Environmental Authorisation Regulations: Listing Notice 2 GN 545 in GG 33306 of 18 June 2010 (repealed in December 2014).
[28] Mineral and Petroleum Resources Development Amendment Act 49 of 2008 (assented on 19 April 2009).
[29] Minerals and Petroleum Resources Development Bill B15-2013 published as GN 567 in GG 36523 of 31 May 2013.

Bill is heavily criticised by both environmental activists and the mining industry.[30]

At the centre of both the NEMA and MPRDA Amendment Bills were attempts to resolve a regulatory conflict, between the ministries of Mineral Resources and Environmental Affairs.[31] This regulatory conflict was partly resolved in 2014 with the enactment of the National Environmental Management Laws Amendment Act.[32] Its relevance is that the mining and extractive processes that produce primary energy sources are the beginning of the entrenchment of fossil fuels. It is a root cause of the problem under study in this Chapter. However, its resolution does not necessarily resolve the broader incoherence between the MPRDA as an energy law and other specific energy legislation.

End-of-pipe control and market regulation addresses symptoms of a problem that lies deep in this seemingly benign primary resource extraction phase. That is one of the reasons why the departments of Mineral Resources and that of Energy have hitherto resisted changes that would subject them, and their sectors, to more stringent environmental regulation. Once the ministries of Mineral Resources and Energy open the doors to more transparent and integrated environmental regulation, it may be feasible for environmental law to mandate specific strategies and standards to neutralise the dominance of fossil fuels from the early phase in the supply chain.

For instance, allowing the Department of Environmental Affairs to oversee and become the competent authority to consider EIA applications for

---

[30] Centre for Environmental Rights (CER) comments on Draft Mineral and Petroleum Resources Development Amendment Bill 2012 (on file); S Blaine 'Environment Bill "causing confusion" Over Mining Development' *Business Day* (29 January 2013); G Morgan 'State Must do More to Manage Mining's Environmental Effects' *Business Day* (17 January 2012) ('A recent report on coal and water futures in SA notes that many of SA's water "catchments are already heavily polluted by mining, and six out of 19 of these will not have enough water to meet demands by 2030". About 12% of our land area generates 50% of our river flow. Much of this 12% also happens to be rich in coal reserves. Water security clearly has to take priority over irresponsible mining interests, especially given that our energy needs can easily be met without jeopardising our valuable natural capital').

[31] The aim of the Mineral and Petroleum Resources Development Amendment Act of 2009 is, among others, '*to align* the Mineral and Petroleum Resources Development Act with the NEMA, 1998 in order to provide for *one environmental management system*'.

[32] Act 25 of 2014 GN 448 in GG 37713 of 2 June 2014 (in effect 3 September 2014).

energy and mining projects could very well result in sustainable extractive activities get authorisation. This presupposes a truce in the struggle for regulatory power between the concerned government departments.[33] This could make mining cumbersome and costly in terms of regulatory compliance and environmental conditions. Consequently, the internalisation of the full environmental cost of relying on fossil fuels comes to the fore. Investing in fossil energy becomes less attractive relative to investing in renewable energy sources. The cost of extracting coal may go up, in tandem with the cost of regulatory compliance with environmental legislation. This is the space where the battle to dislodge fossil fuels must begin. Emissions control and market-based instruments such as carbon taxes or levying electricity are necessary, but secondary controls. Under the MPRDA, it is easy for the coal mining industry to pass on or absorb such taxes and for the energy industry to absorb the levies, by continuing to externalise the environmental and social costs of extracting the primary energy resources needed to generate electricity.

Therefore, the battle to tame the apparent dominance and independence of the Department of Minerals must continue as the first option to dislodge conventional sources of energy. How can this battle be taken forward? Since the enactment of the NEMA, the battle has progressed very slowly with occasional backsliding, like the proposed MPRDA amendments, which represent retrogressive steps relative to the 2008 Amendment Act. Advocacy and lobbying is required to prevent the enactment of a half-baked and unsustainable MPRDA Amendment Bill that further entrenches the dominance of the Department of Minerals Resources and permit the sector to get away with less stringent environmental and sustainability regulation.

South Africa has quite a few natural gas electric power plants.[34] Therefore, it is also necessary to analyse the regulatory framework for gas extraction and assess the extent to which such legislation promotes

---

[33] T Humby '*Maccsand* in the Constitutional Court: Dodging the NEMA Issue' (2013) 24 *Stellenbosch LR* 55, 58 (discussing the *Maccsand* case (note 11 above).

[34] Eskom operates four quick reaction gas turbine power stations with an installed capacity of 2,426 MW.
<http://www.eskom.co.za/AboutElectricity/FactsFigures/Documents/Generation_Mix.pdf>.

environmental sustainability or whether it serves to entrench gas, as a primary source of energy. The Gas Act[35] regulates the gas sector. It is a purely technical regulatory statute and has no provisions on sustainability of the gas extraction process. The MPRDA includes natural gas in the definition of minerals in s 1, and the arguments advanced above in relation to coal mining apply with equal force to the extraction of natural gas for power generation purposes. While it is obvious that using natural gas produces less environmental impacts compared to coal, it is still important that the MPRDA should promote even cleaner sources in the energy mix. Natural gas could be the future primary source of base load power, supplemented by renewable energy.

The outcry over the proposed shale gas mining in the Karoo shows the extent to which, as currently configured the MPRDA and energy laws are misaligned to environmental legislation on the basis of which hydraulic fracturing ('fracking') is being opposed. The Minister of Mineral Resources tried to pacify the environmental lobby by issuing a moratorium of hydraulic fracturing in the Karoo but eventually she caved in to the established energy industry, which is eyeing shale gas hydraulic fracturing as the future of their industry.[36] The Minister developed MPRDA technical regulations, which are themselves vague and will be difficult to use in practice. Globally, natural gas is viewed as the only reliable source with potential to displace coal for base load needs. Whether shale gas has the potential to replace petroleum is not yet settled.[37] Despite this potentially enticing energy outlook, the MPRDA does not provide for full cost accounting and the internalisation of the environmental and social costs associated with fracking. In addition, like any other extractive activity regulated by the MPRDA, the extraction of gas must be subjected to EIA at the

---

[35] Gas Act 48 of 2001.

[36] Department of Mineral Resources 'Investigation of Hydraulic Fracturing: Report of the Working Group' (July 2012) 58-59, 69 (noted the inconclusiveness of scientific research on the environmental hazards of fracturing but recommended conditional approval of exploration); *Environmental Management Plan South Western Karoo Basin Gas Exploration Application: Western Precinct Shell Exploration Company BV* Vol. 1, PASA Reference No 12/3/219; L Havemann, J Glazewski & S Brownlie 'Critical review of the application for a Karoo gas exploration right by Shell Exploration Company BV' (5 April 2011); F Bekker 'Review of the Draft EMP in Support of an Application for Gas Exploration in the Western Karoo (Central Precinct) by Shell Exploration Company' (1 April 2011) <http://www.azef.co.za/pdf/shellgasreview.pdf>.

[37] Ibid, Department of Mineral Resources.

stringent level provided for in environmental legislation,[38] rather than the somewhat industry-friendly process being defended by the ministers of Mineral Resources, and Energy.[39]

The most recent energy laws such as the National Energy Act and the Electricity Regulation Act, were enacted after the age of sustainable development, as enshrined in section 24(b) of the Constitution.[40] However, environmental law (principally under the NEMA and SEMAs) has done more to implement sustainable development than such energy laws. Hence the procurement of renewable energy in South Africa is happening alongside unhindered procurement of more fossil-based and nuclear energy. Even currently, it is a struggle to disentangle energy law and policy-making from the dominance of conventional sources of energy. Existing mining and energy law remains largely technical, and aimed at facilitating resource extraction with little regard to energy sustainability.

Once primary energy sources are extracted and processed they shift from the hands of mining and petroleum companies into the hands of power generation and synthetic companies. The resources are received as raw material inputs to be converted through the generation process into electric power, and other products, which are sold to end-users. At the stage when energy companies take over the product, a set of policies and laws apply, and

[38] The NEMA EIA process in s 23-25 of the Act.

[39] This is apparent when reference is made to attempts to tighten up this regulatory framework through the Proposed Technical Regulations for Petroleum Exploration and Exploitation GN 1032 in GG 36938 of 15 October 2013.

[40] Before 1996 there were several sector and issue specific mining and natural resources legislation that was technical and most aimed at enabling resource exploitation in line with colonial ideology. These include the Environment Conservation Act 73 of 1989, Water Act 54 of 1956, Forests Act 122 of 1984; Minerals Act 50 of 1991, Conservation of Agricultural Resources Act, Hazardous Substances Act 15 of 1973, Atmospheric Pollution Prevention Act 45 of 1965 and the National Parks Act 57 of 1976.

this set of laws is what is popularly termed energy law.[41] None of this legislation regulates the manner in which the primary energy feedstock is mined or extracted from the environment. In other words, the Electricity Regulation Act and petroleum legalisation has little connection to how the MPRDA regulates extraction of energy resources. This becomes quite clear when one considers the exiting legal and policy framework specific to energy.

4.2. The energy policy environment

A number of energy policy documents shaped the current legal framework for energy.[42] Equally, the government has designed a myriad environmental law, policy, and guidelines. Throughout, the government struggled to articulate any effective law on renewable energy, apart from the out-dated White Paper, more than a decade old now without any dedicated legislation in sight. The hypothesis of this study is that these existing energy laws cannot effectively promote renewable technologies. If anything, they are the bedrock on which conventional sources of energy and the established fossil-based energy sector has thrived over the past centuries.[43] This is amply demonstrated in the preceding section of this study. Samba and Kordunsky add that at the Southern African Development Community (SADC) regional level, '[d]evelopment of policy, legal and institutional frameworks that are clear and unambiguous is

[41] This includes chiefly the Electricity Regulation Act 4 of 2006 (ERA); the National Energy Act 34 of 2008; the National Energy Regulator of South Africa Act 40 of 2004; Eskom Conversion Act 13 of 2001; and policy papers like the White Paper on the Renewable Energy Policy of the Republic of South Africa GN 513 in GG 26169 of 14 May 2004, 43 (Renewables White Paper); the White Paper on the Energy Policy of the Republic of South Africa (1998) (Energy White Paper) GN 3007 in GG 19606 of 17 December 1998; and the Electricity Regulations on the Integrated Resources Plans 2010-2030 GN R400 in GG 34263 of 6 May 2011(IRP 2) and the National Climate Change Response White Paper (Climate Change White Paper) GN 757 in GG 34695 of 19 October 2011. This also includes relevant regulations made under the identified legislation.

[42] The Energy White Paper and the development plans.

[43] Tomain (note 5 above) 127 ('Fossil fuels have established a supporting regulatory structure and bureaucracy: and, as public choice theory tells us, interest group politics make it difficult to change policy direction as incumbents enjoy the competitive advantages that access yields. In short, fossil fuel favouritism is firmly entrenched in our political and regulatory cultures').

essential for effective promotion of clean energy initiatives.'[44] An analysis of the existing energy laws and policies is therefore necessary to expose the overemphasis on the perceived security of conventional fossil sources of energy and neglect of renewable sources. Energy regulators need to review the energy policy frameworks from the perspective of promoting renewable energy.

South Africa's energy policy objectives are enshrined in policy documents that are further supported by other programme specific policies. The main policies are the White Paper on Energy Policy (1998), the Renewables White Paper (2004) and the Climate Change Response White Paper (2011) and Nuclear Energy Policy (2007). In summary South Africa aims to:

- Increasing access to affordable energy services;
- Stimulating economic development;
- Improving energy governance;
- Managing energy-related environmental impacts; and
- Securing supply through diversity.[45]

The policy framework has evolved from 1998 with the advent of sustainability thinking and more convincing evidence on climate change and its links to energy generation, to the maturity of renewable energy sources, consistently tampered by the country's social, economic and environmental realities. Admittedly, they are important first steps to inform hard laws, but I chronicle this evolution and deconstruct these policy documents to show how they have been ineffectual in promoting renewable energy.

4.2.1. White Paper on Energy Policy for South Africa of 1998

The White Paper on Energy Policy for South Africa of 1998 sets the future vision for South Africa's energy needs, in a very challenging context. This

---

[44] R Sampa & A Kordunsky 'Technical Report: Role of Regulators in Promoting Clean Energy' (2011) *AECOM International Development for USAID* 10 <http://www.satradehub.org/home/role-of-regulators-in-promoting-clean-energy/callelement>10.

[45] White Paper on Energy Policy (note 29 above).

context include the 'economic, social and environmental policies and forces; the nature of the South African energy sector and its inter linkages with broader forces; and what the sector needs to achieve overall policy goals.'[46] The Energy White Paper highlights some of the persistent challenges confronting energy regulation in South Africa. In particular, the first aspect continues to be a contentious issue, namely to what extent can South Africa delay its constitutional socio-economic promises and global commitments to reduce climate change and promote sustainability.[47] Should South Africa be exploiting abundant fossil fuels to drive economic development, deliver on social goals, and then later on join the international community in the fight against climate change? Views on these issues are divided, with a growing chorus of researchers and activists who argue that the country can afford to downscale on coal and upscale on renewable energy.[48]

The uncertainty regarding which objectives to prioritise has undoubtedly shaped the approach of the government to renewable energy. At the policy level, there is a deep-seated disjuncture between energy and environmental law. The result is the slow pace towards developing a certain and clear-cut law on renewable energy. While environmental laws can bolster arguments for renewable energy, existing environmental laws say little directly about renewable energy, focusing mainly on promoting sustainable development broadly. By focusing heavily on access to affordable energy and energy security, in a way, the 1998 Energy White Paper was a missed opportunity to integrate energy and environmental law.

Five key objectives of the Energy White Paper are to: increase access to affordable energy; improve energy governance; stimulate economic development; manage energy-related environmental and health affects; and

---

[46] Ibid 6-7.
[47] These global commitments can be seen from the suite of environmental legislation enacted since 1998 in pursuit of sustainable development.
[48] 'Why Stop Producing Carbon' *Mail & Guardian* (4 November 2010); M Davies 'We Don't Need Kusile Power Plant in South Africa: Here's Why...' <http://www.greenpeace.org/africa/en/News/Blog/we-dont-need-kusile-power-plant-in-south-afri/blog/37646 >; World Wide Fund for Nature (WWF) '50% by 2030: Renewable Energy in a Just Transition to Sustainable Electricity Supply' Energy Review (2010).

secure supply through diversity.[49] While these objectives have implications for traditional environmental health concerns, the Energy White Paper and the strategies adopted are not informed by sustainable development paradigm. Development policies of the government of the day took priority.[50] It was only in 2004 that the Energy White Paper was augmented by the White Paper on Renewable Energy to focus specifically on developing a policy on renewable energy in South Africa. While the Energy White Paper spawned subsequent legislation like the National Energy Act and amendments to the Electricity Regulation Act, nothing has yet come out of the Renewable Energy White Paper.[51] The Energy White Paper did not only deal with conventional energy carriers, but also contained peripheral policy objectives provisions on renewable energy.

It is clear from the Energy White Paper that as early as 1998, the government realised that there are constraints hampering the development and deployment of renewable energy technologies in South Africa. However, no specific policy strategies to address these constraints were developed. The Energy White Paper therefore carries little value in the formulation of legal policy to facilitate a transition to an energy mix where renewable sources have a substantial share in South Africa. In fact, it is shows a policy position where the fossil fuels were still thought to be indispensable. If the Energy White Paper of 1998 left this policy gap, the question then is whether the 2004 Renewables White Paper cured this policy gap?

---

[49] Renewables White Paper (note 41 above) 8-9.

[50] For how these development policies affected the electricity sector see S Greenberg 'Market Liberalisation and Continental Expansion: The Repositioning of Eskom in Post-apartheid South Africa' in McDonald *Electric capitalism: Recolonising Africa on the power grid* (2009) 73; L Gentle 'Escom to Eskom: From Racial Keynesian Capitalism to Neo-liberalism (1910-1994)' in McDonald *Electric capitalism: Recolonising Africa on the power grid* (2009) 50, 67-68. The remainder of the Energy White Paper and the strategies adopted are focused on developing policy and strategies on demand-side management and the promotion of transformation in the energy sector in line with the development policies of the government of the day.

[51] Except perhaps the National Energy Act, which provides for sustainable development but beyond a mere statement of object, does not articulate strategies to ensure sustainable energy, apart from integrated energy planning.

4.2.2. White Paper on Renewable Energy Policy of South Africa 2003

It is important to understand the context of the designing of the Renewables White Paper, especially the global environmental developments to show the policy shifts since 1998.[52] An interesting contrast is the treatment of climate change and the international imperatives for renewable energy in both White Papers. Whereas the Energy White Paper made a cursory mention of global GHG emissions and made no specific mention of the need for South Africa to work in the context of the UN Framework Convention on Climate Change (UNFCCC)[53] and the Kyoto Protocol; the Renewables White Paper extensively discusses the urgency of the transition to sustainable development through renewable energy as a mitigation measure.[54]

It is in this respect that the Renewables White Paper represented a turning point in the policy approach, which was beholden to fossil fuels. Taking a cue from developments in environmental law, a conscious effort was made to ground the need to promote renewable energy sources in the concept of sustainable development as enshrined in s 24 of the Constitution.[55] The Renewables White Paper clearly emphasises that

> [r]enewable energy that is produced from sustainable natural sources will contribute to sustainable development. As most of the sources are indigenous and naturally available, security of energy supply is improved and not disrupted by short-term international crises.[56]

This is the most significant element of the Renewables White Paper for this study; it directly confirms the complementarity between sustainable development, renewable energy, and the international context. Unfortunately, the 'hard' energy laws do not carry forward this explicit grounding of energy

---

[52] The environmental and energy landscapes have changed since 2003 both locally and internationally. The electricity profile of South Africa has changed beyond what was contemplated in the Renewables White Paper.
[53] (1992) 31 *ILM* 849
[54] Renewables White Paper (note 41 above) 43.
[55] Renewables White Paper (note 41 above) 26 (the paper expressly incorporates the conception of sustainable development as defined in the National Environmental management Act – thus creating direct synergies with environmental law).
[56] Ibid 26.

regulation in environmental sustainability. This is because no explicit renewable energy legislation was ever made to implement the policy positions in the Renewables White Paper. The purpose of this study is partly to call on government to implement laws that implement the policy aims of the Renewables White Paper.

The main objective of the Renewables White Paper is 'to create the conditions for the development and commercial implementation of renewable technologies' in South Africa's energy mix with specific targets aimed at energy sustainability.[57] This objective is articulated in the context of the global movement towards sustainability in the energy sector.[58] This was inevitable, as by 2004 South Africa had vastly revised its environmental laws with sustainable development becoming foundational to legislation and regulatory policy.[59] Taking stock of its energy industry policies and the future direction of energy development, South Africa realised that s 24 of the Constitution could not be fully fulfilled without making earnest efforts to develop ecologically sustainable energy sources as part of the greater energy development strategy.[60]

A more fundamental underlying theme of the Renewables White Paper, relevant to this study, is the need to develop an enabling legal environment to promoting renewable energy. The legal framework is expected to create a regulatory environment that can promote renewable energy sources. This objective is provided in Strategic Objective No 2 whose goal is '*To develop, implement, maintain and continuously improve an effective legislative system to promote the implementation of renewable energy.'* [61] This objective of the Renewables White Paper is at the convergence of energy and environmental

---

[57] Ibid, the 10000 GWh of renewables by 2013 was never met; see Anton Eberhard, *South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons* (World Bank, Washington DC: 2014) 6.

[58] World Energy Council *World Energy Trilemma: Time to get Real - the Case for Sustainable Energy Investment* (2013) World Energy Outlook (2014) IEA.

[59] *BP Southern Africa (Pty) Ltd* v *MEC for Agriculture, Conservation, Environment and Land Affairs* 2004 (5) SA 124 (W) 144A-B; *Director: Mineral Development, Gauteng Region and another v Save the Vaal* 719C-D.

[60] M Borchers, M Euston-Brown & L Mahomed, 'Energy Planning in South African Cities' in Peter Droege (ed), *Urban Energy Transition: From Fossil Fuels to Renewable Power* (Elsevier, 2011) 564.

[61] Renewables White Paper (note 41 above) 33-34.

regulation and is necessary to remove regulatory uncertainties. Other supporting objectives are outlined in Renewables White Paper.[62]

Unfortunately, this study discovered that since 2004 there has been negligible progress towards this strategic goal. A tardy pace towards a low-carbon economy supported by renewable energy, dawned with the failure to develop an enabling renewable energy law. Practically South Africa does not have renewable energy law as such. The deliverables under Strategic Objective 2 support the argument that creating an appropriate legal environment determines the success rate of renewables deployment in South Africa's electricity sector. Legal certainty is required to remove the obstacles to renewable energy identified in the Renewables White Paper.[63]

The absence of specific laws in relation to the barriers to sustainable energy discussed in Chapter 3 above, is a key obstacle to renewable energy in South Africa.[64] The World Energy Council in its 2013 World Energy Trilemma report confirms this decisive role of regulatory frameworks by concluding that, '[t]he "right" risk allocation starts with a coherent energy policy and well-implemented energy regulatory framework to minimise political and regulatory risk. This point was stressed by industry in the 2012 World Energy Trilemma report where it was noted that the best mechanism to drive investment is a stable, predictable policy framework.'[65] Unfortunately, up until 2012 there has been negligible practical progress towards the above strategic goals. The recent 2012-2015 achievements under the REIPPPP occurred under improvised amendments to the Electricity Regulation Act, and not as a direct implementation of the Renewables White Paper whose targets had since been missed in 2010.

To achieve Strategic Objective 2, the Renewable Energy White Paper identifies five guiding principles.[66] These guiding principles shaped the

---

[62] Ibid.
[63] Ibid; see also World Energy Council *World Energy Trilemma: Time to get Real - the Case for Sustainable Energy Investment* (2013) 12.
[64] S Karekezi *et al* 'Renewable Energy Technologies in Africa' (1997) *African Energy Policy Research Series* 136-137.
[65] World Energy Council (note 63 above) 61.
[66] Called Essential Elements for Renewable Energy Implementation in the White Paper, 26.

objectives, strategies, and implementation strategies provided for in the Renewables White Paper. The principles are full cost accounting, equity, global and international cooperation and responsibilities, allocation of functions and participation.[67] These key principles echo the principles of environmental management in s 2 of the NEMA, which is discussed in Chapter 4. Is this an indication of the desire to align the principles driving environmental sustainability into renewable energy policy? The principles also show how the Renewables White Paper was framed with a view to aligning energy and environmental law and the constitutional exhortation to promote ecologically sustainable socio-economic development in s 24 of the Constitution.

The first principle of *full cost accounting,*[68] analysed in Chapter 5, is central to a discussion of fragmentation of energy and environmental law, as it seeks to internalise environmental costs into energy planning and costing. Regulators can only make effective policy choices among different energy carriers or sources when there is full cost accounting of the total costs of each source of energy.[69] These include indirect social, environmental, or ecological costs that are often ignored or discounted as remote and therefore irrelevant costs borne by society.[70] Extensive policy studies indicate that the pricing determination for electricity in South Africa has hugely discounted the environmental cost of producing power from fossil fuels.[71] Nkomo argues that

---

[67] Renewables White Paper (note 41 above) 26.

[68] Defined by J Bebbington et al *Full Cost Accounting: An Agenda for Action* (2001) 7-8 as 'a system which allows current accounting and economic numbers to incorporate all potential/ actual costs and benefits into the equation including environmental (and perhaps) social externalities to get the prices right', see also PR Epstein *et al* 'Full Cost Accounting for the Life Cycle of Coal' (2011) 1219 *Annals of the New York Academy of Sciences* 73, 78-79.

[69] Ibid, PR Epstein *et al*; see also N Antheaume 'Valuing External Costs - From Theory to Practice: Implications for Full Cost Environmental Accounting.' (2004) 13 *European Accounting Review* 443, 444; generally, J Bebbington & R Gray 'An Account of Sustainability: Failure, Success and a Reconceptualization' (2001) *Critical Perspectives on Accounting* 557.

[70] Renewables White Paper (note 41 above) 27.

[71] International Energy Agency (IEA) 'The Impact of Global Coal Supply on Worldwide Electricity Prices: Overview and comparison between Europe, the United States, Australia, Japan, China and South Africa' Report by the IEA Coal Industry Advisory Board (2014) 52 (South African electricity prices do not reflect the full economic cost of supplying power); R Spalding-Fecher & DK Matibe 'Electricity and Externalities in South Africa' (2013) 31 *Energy Policy* 724; Business Enterprises, University of Pretoria 'The External Cost of Coal-Fired Power Generation: The Case of Kusile' (2011)

electricity pricing must be looked with a view to fully accounting for the cost of producing electricity from coal. [72] Current pricing of electricity is therefore clearly based on a subsidised accounting model, which involves externalising (discounting) many of the social and environmental cost of producing energy from fossil fuels.[73] Electricity pricing under the Multi-Year Price Determination (MYPD)[74] by NERSA, focuses more on economic sustainability and protection of the poor, while ignoring the ecological footprint of the electricity.

The second principle of *equity* reiterates a core component of sustainable development,[75] namely intra- and inter-generational equity. Applying this to the electricity sector, current generations must not exhaust non-renewable primary energy sources[76] by using alternative sources to enable future generations to access the non-renewable sources. Even in using renewable energy sources, we must use them sustainably and not wastefully to deprive future generations of the same resources.[77] This brings into the Renewable Energy White Paper an inter-generational duty to use natural resources sustainably.[78] The principle of equity[79] as stated also includes the notion of intra-generational equity, namely that we must ensure equity or equality among existing generations in terms of accessing energy resources.

<http://www.greenpeace.org/africa/Global/africa/publications/coal/FULL%20SCIENTIFIC%20PAPER%20139%20pages.pdf>; Y Groenewald 'Coal's Hidden Water Cost to South Africa' (2012) Commissioned by Greenpeace Africa, 3.

[72] JC Nkomo 'Energy and Economic Development', in H Winkler (ed) *Energy Policies for Sustainable Development in South Africa: Options for the Future* (2006) 84.

[73] C van Horen *Counting the Social Costs: Electricity and Externalities in South Africa* (1996), 14; S Klasen 'Social, Economic, and Environmental Limits for the Newly Enfranchised in South Africa?' (2002) 50 *Economic Development and Cultural Change* 607, 626; R Spalding-Fecher, A Williams & C van Horen 'Energy and Environment in South Africa: Charting a Course to Sustainability' (2000) 4 *Energy for Sustainable Development* 8,14; P Söderholm & T Sundqvist 'Pricing Environmental Externalities in the Power Sector: Ethical Limits and Implications for Social Choice' (2003) 46 *Ecological Economics* 333, 335.

[74] NERSA 'Multi-Year Price Determination (MYPD) Methodology' (2012) read with Eskom 'Multi Year Price Determination 3 (MYPD3) 2013/2014-2017/2018.'

[75] P Sands & J Peel *Principles of International Environmental Law* (2012) 2; EB Weiss 'In Fairness to Future Generations' (1989) *Resources* 83; see also s 2(4)(d) of the NEMA.

[76] Also included in s 2 (4) (v) of the NEMA.

[77] Section 2 (4) (vi) of the NEMA.

[78] EB Weiss 'Our Rights and Obligations to Future Generations for The Environment' (1990) 84 *The American Journal of International Law* 84.

[79] D Shelton 'Equity' in D Bodansky, J Brunnee & E Hey *The Oxford Handbook of International Environmental Law* (2007) 1080.

This is important to the whole strategy behind the Renewables White Paper, as poverty alleviation is one of the deliverables of a sustainable energy policy.

The above connects well to the fifth principle – *participation* that encourages stakeholder involvement to achieve equitable and effective participation in energy decision-making processes. The third and fourth principles are *global and international cooperation, and responsibilities* and *allocation of functions*. As discussed in detail in Chapter 2, global and international imperatives while relevant have done little to cajole South Africa towards a sustainable renewable energy regime.[80] Allocation of functions speaks to the constitutional arrangement for energy policy and regulation. The idea is to improve the energy decision-making process across the three spheres of government to promote efficiency and cooperation. For reasons stated above, this remains one of the obstacles to explicit laws on renewable energy.[81]

Apart from the key principles discussed above, the Renewables White Paper also identifies essential elements for renewable energy. First, *sustainable development* must underpin its implementation; second, an *enabling environment* is necessary; third, necessary *institutional support arrangements* must be established; and last, there must be support for the development of the renewable *energy technologies*.[82] These are the key essential elements providing a framework for the principles to work towards the strategic objective of creating an enabling environment. The question remains whether this strategy has worked in practice to promote implementation of the Renewables White Paper. Similarly, these policy components provide a context for aligning South Africa's energy objectives and environmental regulation if properly implemented.

The first element of *sustainable development* is discussed in detail in Chapter 1.[83] The Renewables White Paper states that, not only is renewable

---

[80] K Menyah & Y Wolde-Rufael 'Energy Consumption, Pollutant Emissions and Economic Growth in South Africa' (2010) 32 *Energy Economics* 1380.
[81] see C Bosman, L Kotze & W du Plessis 'The Failure of The Constitution to Ensure Integrated Environmental Management from a Co-Operative Governance Perspective' (2004) 19 *SA Public Law* 41, 46.
[82] These are discussed in detail in the Renewables White paper (note 41 above) 26.
[83] See analysis of 'sustainable development' and cases in note 16 above.

energy green, but it can also eventually contribute to sustainable development.[84] While literature indicates a causal connection between energy and economic growth,[85] little by way of empirical evidence exists to show the same nexus between energy and sustainable development – which is not synonymous with economic growth.[86] However, sustainable development, properly implemented, can lead to the development of sustainable energy systems[87] that could support sustainable development rather than unsustainable economic growth.[88]

A glaring omission by the Renewables White Paper in relation to the third essential element is the failure to address the issue of institutional fragmentation in terms of the ministerial functional fragmentation that is proving to be a barrier to renewable energy. In particular, the Renewables White Paper had to deal with the tension between energy-related ministries and environment-related ministries in terms of policy implementation and the balancing of the country's social, economic, and environmental interests.[89] This institutional misalignment remains one of the obstacles towards renewable energy particularly at the municipal level. This obstacle, while largely political, can be dealt with through a better legal framework that clearly delimits the mandates of government departments whose activities either promote or stymie

---

[84] Renewables White Paper (note 41 above) 26.
[85] NM Odhiambo 'Electricity Consumption and Economic Growth in South Africa: A Trivariate Causality Test' (2009) 31 *Energy Economics* 635, 636-637; generally NM Odhiambo 'Energy Consumption, Prices and Economic Growth in Three SSA Countries: A Comparative Study' (2010) 38 *Energy Policy* 2463, 2465; R Spalding-Fecher 'Energy and Sustainable Development in South Africa' (2002) *Sustainable Energy Watch* 10/42.
[86] K Kaygusuz 'Energy for Sustainable Development: A Case of Developing Countries' (2012) 16 *Renewable and Sustainable Energy Reviews* 18; R Cassim & W Jackson 'Sustainable Development: The Case of Energy in South Africa' *Trade and Industrial Policy Strategies (TIPS)* (2004).
[87] C Mitchell & B Woodman 'Regulation and Sustainable Energy Systems' in R Baldwin, M Cave & M Lodge *The Oxford Handbook of Regulation* (2010) 572, 578 define 'sustainable energy systems' as 'one where environmental impacts were minimised in both the short and the long term, and where there is the potential for secure and acceptably priced energy (if not now, then in the future)'.
[88] UN Environment Programme and UN Economic Commission for Africa *Making Africa's Power Sector Sustainable: An Analysis of Power Sector Reforms in Africa* (2007); UN ENERGY/Africa publication to CSD 15, *Energy for Sustainable Development: Policy Options for Africa*, 32.
[89] W du Plessis 'Energy Law and Environmental Protection in South Africa' in CA Brebbia & I Sakellaris (eds) *Energy and the Environment: The Sustainable World* (2003) 111.

progress towards sustainable renewable energy.[90] To prevent conflicts and promote regulatory integration, the constitutional distribution of legislative competences across the three spheres of government on energy issues should be reviewed and refined.[91]

4.2.3. Climate Change Response White Paper 2011

Climate change is one of the biggest global challenges facing humanity, transcending the purely environmental problems.[92] The causal connection between the energy industry and climate change makes climate change a justification for the transition from convention fossil energy to renewable energy. Regardless, South Africa must promote renewable energy for other reasons beyond the scope of this study.[93] The country must promote cooperative governance and integrate law and policy on energy and environmental law[94] (particularly air pollution control) to address this causal connection. This could maximise progress towards reducing GHG emissions from the energy industry.

Despite the urgency of climate change, many countries do not have specific climate change laws; many, however, are fast enacting such laws.[95] An equally huge number of countries are using existing energy, disaster

---

[90] This issue is dealt with in detail below, section 4.4 on 'Existing framework for integrated energy planning'.
[91] Attempt at this was made in terms of the Constitutional Amendment No. 19, which has never seen the light of day. The Intergovernmental Relations Framework Act 13 of 2005, read with the principles of cooperative government in s 41 of the Constitution, could lessen conflicts.
[92] For definitions, conceptual underpinnings of climate change, and research on this subject see the work of the Intergovernmental Panel on Climate Change (IPCC), especially the Assessment Reports <http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#2> and Special Reports on Renewable Energy <http://www.ipcc.ch/pdf/special-reports/srren/SRREN_Full_Report.pdf>.
[93] H Strydom & N King *Environmental Management in South Africa* (2009) 767.
[94] Bosman, Kotze & Du Plessis (note 81 above) 411, 414-415; E Bray 'Focus on the National Environmental Management Act: Cooperative Governance in the Context of the National Environmental Management Act 107 of 1998' (1999) 6 *SAJELP* 3.
[95] See R Mwebaza & LJ Kotze 'Environmental Governance and Climate Change in Africa: legal perspectives' (2009) 167 *Institute for Security Studies Monographs* 283; UK Climate Change Act of 2008, Chapter 27; USA Climate Change Bill 2010 and various initiatives underway; Germany has various renewable energy-related legislation but nothing specific to climate change; Australian states are coming up with their own climate change Acts, e.g. Victoria has a Climate Change Act.

management, conservation, and environmental laws to address the climate change challenge.[96] A singular regulatory approach cannot address climate change because it is a pervasive complex problem; therefore, there must be cross-sector collaboration and coordination.[97] A number of these sectors – energy, natural resources, environment, forestry, agriculture, disaster management, land-use planning and transportation – are the biggest consumers of energy, while others are major sources of GHG emissions.[98]

Global and national level progress has been slowed down by the complexity and multifaceted interests affected by climate change. In this angle Dugard aptly notes that;

> [c]limate change is a difficult problem with complex interdependencies, and radical uncertainty about effects of different measures. The need for long time-horizons and solutions that transcend national boundaries render existing decision-making structures poorly suited to deal with the problems. Their potential for producing sustainable and equitable solutions is further diminished by unequal power relations and divergence of economic and political interests. But the paralysis is also related to how we frame and understand the issues, which narratives and discourses emerge and become dominant, and whose voices are heard and included in decision-making processes.[99]

Despite its complexity and given the importance of climate change as a driver for renewable energy as demonstrated in Chapter 2, an analysis of how energy and environmental law proposes to address mitigation and adaptation is necessary.

The 2013 World Energy Outlook emphasises that, 'as the source of two-thirds of global green-house gas emissions, the energy sector will be pivotal in determining whether or not climate change goals are achieved.'[100] It is thus central to this study to assess the extent to which energy and environmental laws incorporate emission reduction strategies.

---

[96] Ibid, Mwebaza & Kotze 283.
[97] Climate Change White Paper (note 41 above) 10.
[98] Ibid, 17.
[99] J Dugard, AL St Clair & S Gloppen 'Introduction: Climate Change Justice: Narratives, Rights and The Poor' (2013) 29 *SAJHR* 6, 7-8.
[100] World Energy Outlook (2013) 'Executive Summary' 1 <http://www.iea.org/publications/freepublications/publication/WEO2013_Executive_Summary_English.pdf>.

The international law governing climate change is the UNFCCC of 1992 and the Kyoto Protocol of 1997.[101] Overwhelming scientific evidence points to human-induced emission of GHG as the major cause of climate change.[102] This evidence also points to the energy industry as the biggest single source of GHGs, contributing 60%.[103] In its *4th Assessment Report: The Scientific Basis,* the IPCC noted,

> '[e]missions of CO2 from fossil fuel use and from the effects of land use change on plant and soil carbon are the primary sources of increased atmospheric CO2. Since 1750, it is estimated that about two thirds of anthropogenic CO2 emissions have come from fossil fuel burning and about 1/3rd from land use change.'[104]

This dominant role of fossil fuels is confirmed in South Africa where the majority of emissions come from the electricity sector – contributing 40% of the 80% of emissions attributable to the energy industry.[105] South Africa is also the biggest emitter of GHGs in Africa and one of the most energy- and emission-intensive countries in the world.[106]

Energy intensity is itself a unique problem because a study by the International Energy Agency (IEA) has shown that energy costs are not a huge variable in influencing competitiveness, but this normal situation changes drastically in relation to energy-intensive industries such as cement, iron and steel, chemicals and aluminium, especially in export-oriented economies.[107] It is therefore natural for South Africa to focus on the energy industry to reduce

---

[101] South Africa ratified the Convention and acceded to the Protocol in 2002.
[102] AB Pittock *Climate Change: The Science, Impacts and Solutions* 2nd ed (2009) 7 and 105.
[103] Strydom & King (note 93 above) 1070; JT Houghton *et al* 'Climate Change 1995: The Science of Climate Change: Contribution of Working Group I' (1996) *Second Assessment Report of the Intergovernmental Panel on Climate Change* 13. Energy for a Sustainable Future, The UN Secretary-General's Advisory Group on Energy and Climate Change (AGECC) 'Summary report and recommendations' (28 April 2010) 7.
[104] S Solomon et al (eds) *Climate Change 2007 – The Physical Science Basis Contribution of Working Group I to the Fourth Assessment Report of the IPCC* (2007) 25; also confirmed by D Hartmann *et al* 'Observations: Atmosphere and Surface' in TF Stocker et al *Climate Change 2013: The Physical Science Basis Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (2013) 167.
[105] Climate Change White Paper (note 41 above) 26 (Year 2000 statistics).
[106] Renewables White Paper (note 41 above) 10 and 11 (Figure 2).
[107] Ibid 10 and 11 (Figure 2); the South African economy is still highly energy-intensive, see Borchers, Euston-Brown & Mahomed (note 60 above) 569.
[107] World Energy Outlook (note 100 above) 2.

GHG emissions.[108] This is why it is even more significant to focus on the electricity sector within energy industry. Significant reductions of emissions can come from energy efficiency, reducing energy consumption and shifting from fossil fuels to low-carbon or renewable energy sources.[109] Research indicates that no amount of reducing GHG emissions will stop the climatic changes expected in the near future.[110] However, reducing emissions can ensure that the impacts will be less damaging and that we can adapt to such impacts. While there has been little research on the impacts of climate change on energy in Africa as a whole,[111] there is no dispute that this is the sector to focus on to mitigate climate change impacts. Climate change is the challenge that may inspire integration of energy and environmental law.[112]

In 2011, South Africa developed a Climate Change White Paper.[113] The object of the paper is to define South Africa's approach and strategies to mitigate and adapt to climate change. The approach 'balances the country's contribution… to the international effort to curb global emissions with the economic and social opportunities presented by the transition to a lower-carbon economy…'[114] Among other things, the Climate Change White Paper proposes huge leaps in the energy sector, the biggest contributor to emissions. In this respect, the paper provides:

> In the medium-term, the mitigation options with the biggest mitigation potential are:
>
> - shifting to lower-carbon electricity generation options;

---

[108] Climate Change White Paper (note 41 above) 26.
[109] Ibid 26.
[110] International Council for Science (ICSU) 'Discussion paper by the Scientific and Technological Community' *14th Session of the UN Commission on Sustainable Development (CSD-14)* 8 <http://www.icsu.org/what-we-do/projects-activities/un-csd/pdf/csd-14-discussion-paper.pdf>.
[111] ML Parry & Group Intergovernmental Panel on Climate Change, Working II 'Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II' (2007) *Fourth Assessment Report of the Intergovernmental Panel on Climate Change* 446.
[112] Tomain (note 5 above) 13.
[113] The White Paper has been met with mixed reactions from analysts and scholars: see generally K Flottum & O Gjerstad 'The Role of Social Justice and Poverty in South Africa's National Climate Change Response White Paper' (2013) 29 *SAJHR* 61-90; S Smith 'Climate Change and South Africa: A Critical Analysis of the National Climate Change Response White Paper and the Push for Tangible Practices and Media-driven Initiatives' (2013) 7 *Global Media Journal - African Edition* 47, 64.
[114] Climate Change White Paper (note 41 above) 5.

- significant up scaling of energy efficiency applications, especially industrial energy efficiency and energy efficiency in public, commercial and residential buildings and in transport; and
- promoting transport-related interventions including transport modal shifts (road to rail, private to public transport) and switches to alternative vehicles (e.g. electric and hybrid vehicles) and lower-carbon fuels.

In the short and medium term, several other options are available with a smaller mitigation potential, including:

- carbon capture and storage in the synthetic fuels industry;
- options for mitigating non-energy emissions in agriculture and land-use; and
- transitioning the society and economy to more sustainable consumption and production patterns.[115]

Indeed, the climate change interventions proposed in the Climate Change White Paper do not necessarily present an obstacle to the economic growth needed in South Africa. The IEA has noted that energy competitiveness can co-exist with economic growth. However, this requires the implementation of certain pragmatic measures, namely, '– improving efficiency, limiting the construction and use of the least-efficient coal-fired power plants, minimising methane emissions in upstream oil and gas, and reforming fossil-fuel subsidies – that could halt the increase in emissions by 2020 without harming economic growth.'[116] These measures implicate the policy and on-the-ground situation in South Africa where the country is largely going in the opposite direction with the energy building programme.

Renewable energy and energy efficiency programmes[117] are sites for substantial progress in climate change mitigation.[118] While the Climate Change White Paper presents some prudent strategies, the fact that one government department responsible for the environment solely drives the development of the policy is problematic given the complexity of climate change. It is unclear

[115] Climate Change White Paper (note 41 above) 26-27.
[116] World Energy Outlook (note 100 above) 3.
[117] Department of Minerals and Energy, Government of South Africa 'Energy Efficiency Strategy of the Republic of South Africa' (2005).
[118] Climate Change White Paper (note 41 above) 31.

what role is envisaged for other affected government departments such as energy, minerals, transport, local government, forestry, and agriculture. This regulatory fragmentation has been the Achilles heel of the successful implementation of well-crafted environmental and energy laws in South Africa.[119] The strategy to use energy-related programmes builds on the long-term vision in the Integrated Resource Plan 2 (IRP 2) developed in terms of the ERA.[120] The IRP 2 is discussed below to assess how it provides space for renewable electricity in South Africa's energy future.

Policies are not laws and usually a policy is formulated to inform future laws.[121] Although policies can still be used to guide future government strategies and plans, it remains difficult to hold government accountable based on policy pronouncements. This simplistic elaboration of the relationship between law and policy masks the complex interplay between law and policy and the feedback loops created in the process of creating one or the other. The flexibility allowed by policy leaves government too much discretion on implementation, while law can sometimes become too inflexible. In South Africa there are a number of energy policies discussed above, that have remained policies for far too long with no tangible legally binding outcomes. Apart from the energy specific policy documents discussed above, there other policy documents that South Africa has developed that indirectly require measures to be taken to promote an energy mix that include renewable energy or low-carbon energy sources.

---

[119] L Kotze 'Environmental Governance' in AR Paterson & LJ Kotzé *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (2009) 103, 111-112.
[120] Electricity Regulations on the Integrated Resource Plan 2010-2030 GN R400 in GG 34263 of 6 May 2011.
[121] Community Organisers' Toolbox 'Understanding Government' <http://www.etu.org.za/toolbox/docs/govern/policy.html> ('A policy outlines what a government ministry hopes to achieve and the methods and principles it will use to achieve them. It states the goals of the ministry. A policy document is not a law but it will often identify new laws needed to achieve its goals. Laws set out standards, procedures and principles that must be followed. If a law is not followed, those responsible for breaking [it] can be prosecuted in court.').

4.2.4. A note on the National Development Plan

If the White Papers represent missed opportunities to promote sustainable energy, the latest development blueprint for South Africa was clearly articulated with this in mind. The National Development Plan (NDP)[122] has a clear strategy to reduce reliance on fossil fuels, promote renewable energy all aiming towards a low-carbon economy that can assist the country with its climate change objectives. The NDP recognises the centrality of energy to economic development, but in the same breath shows awareness that the energy sources must be sustainable – a direct connection between energy and environmental policy. In this respect, the NDP provides that energy security must be promoted through diligent exploitation of coal and exploration of clean coal technologies while opening space for IPPs and renewable sustainable sources to reduce GHG emissions.[123] Diversity of energy sources and an appropriate energy mix are the hallmarks of an energy system that is embedded in environmental sustainability. If properly implemented the NDP is currently the better guiding policy document to ensure that environmental law supports sustainable energy sources without unduly constraining security of supply and affordability.

Formidable challenges still stand in the way of the success of these policy instruments to promote renewable energy sources. Since 1996 the grid has expanded and access has improved, but the economic sustainability of the strategies remains doubtful as long as the main source of energy is coal. Shifting towards renewable energy can plug the policy gaps especially as the regions in need of energy are now mainly rural dispersed areas. Global environmental concerns especially climate change, are introducing further policy challenges for South Africa. Hence, the government has recently made serious efforts to address climate change as a threat to sustainability and

---

[122] National Planning Commission's (NPC) *Our Future Make it Work: National Development Plan* (2011) 163 (forecasting a decline in the energy intensity of the South African economy) < http://www.poa.gov.za/news/Documents/NPC%20National%20Development%20Plan%20Vision%202030%20-lo-res.pdf >.
[123] Ibid, National Development Plan 167-168.

energy security (affordability, access and reliability).[124] It is expected that climate change policy, informed by the Renewables White Paper and the NDP, can boost the transition to a sustainable energy mix. Effective integrated energy resources planning that balance the country's socio-economic and environmental objectives with the need to keep the light on can aid this process.

4.2.5. On free alternative energy and efficiency

At the policy level, in addition to the two energy white papers, the Department of Energy developed other policy strategy documents to guide decision-making on supply and demand for electricity. Thus, demand pressures are increased by the need to supply free basic electricity to every household under the Free Basic Alternative Energy Policy (Household Energy Support Programme) of 2007.[125] Since 2005, the Department of Energy has been trying to regulate the demand side of electrical energy consumption instead of focusing solely on supply-side issues.

The Energy Efficiency Strategy created in 2005 and reviewed in 2008[126] aims to promote energy efficiency. Energy Efficiency is a complementary strategy that in itself is a source of energy – that is, energy saved is energy produced.[127] The strategy is reviewed periodically and a draft was sent out for comments in 2013.[128] All these energy sector strategies focus mainly on promoting access to affordable energy as a way to promote development and

---

[124] BK Sovacool & MA Brown, 'Competing Dimensions Of Energy Security: An International Perspective' (2010) 35 *Annual Review of Environment and Resources* 77, 80.
[125] Department of Minerals and Energy, Government of the Republic of South Africa 'Free Basic Alternative Energy Policy (Household Energy Support Programme)' GN 391 in GG 29760 of 2 April 2007.
[126] Department of Minerals and Energy, Government of the Republic of South Africa 'National Energy Efficiency Strategy of the Republic of South Africa' (First review 2008) GN 908 in GG 32342 of 26 June 2009; see also NERSA Consultation Paper 'Revision of regulatory rules for Energy Efficiency and Demand Side Management (EEDSM) including Standard Offer Programme (SOP)' (June 2010).
[127] Department of Minerals and Energy, South Africa 'Energy Efficiency Strategy of the Republic of South Africa' March 2005; RL Ottinger 'Energy Efficiency: The Best Immediate Option for a Secure, Clean, Healthy Future' (2006) 30 *Natural resources forum* 318, 326.
[128] Draft Second National Energy Efficiency Strategy Review GN 1000 in GG 35920 of 29 November 2012.

alleviate poverty. However, formidable challenges stand in the way of their success.

Since 1996 the grid has expanded and access has improved, but the economic sustainability of the strategies remains doubtful as long as the main source of energy is coal. Shifting towards renewable energy can plug the policy gaps especially as the regions in need of energy are now mainly rural dispersed areas. Apart from the usual fears, global environmental concerns especially climate change, are introducing new policy challenges for South Africa. Hence, the government has recently made serious efforts to address climate change as a threat to sustainability and energy security (affordability, access and reliability).[129] It is expected that climate change policy can boost the transition to renewable energy. I hope that, some legally binding law will be made from the policy document.

Lately, the government has taken some visible steps to implement policies promoting the Energy Policy and Renewables White Papers, yet the absence of or more explicit legally binding instruments still hampers progress towards renewables. Indeed, some concrete laws like the National Energy Act have resulted from the White Papers. Nevertheless, whether in the form of policy or law, the following analysis of South Africa's existing energy laws shows that they remain steeped in the fossil age. They do little to promote renewable energy.

4.3. Electricity legal framework

In the ordinary course of things, the energy policies discussed above should inform the subsequent formulation of laws. The majority of current energy laws[130] in South Africa were created to regulate conventional fossil sources of energy. These laws regulate who may generate, transmit, and distribute electricity, as well as the determination of the price of electricity at national and

[129] Sovacool & Brown (note 132 above) 80.
[130] The electricity sector statutes are the National Energy Act 34 of 2008; National Energy Regulator Act 40 of 2004; Electricity Act 41 of 1987; the ERA 4 of 2006 and Nuclear Energy Act 46 of 1999 see also du Plessis (note 1 above) 31.

municipal levels.[131] The hard laws on energy continue to be narrowly technically and focused on enabling conventional sources, and they are not responding to the policy objectives in the policy papers discussed in 4.2 above. The expectation of energy security to maintain economic activity with the hope of alleviating poverty through employment creation appear to be holding South Africa back from consistently following through policy pronouncements with concrete laws and regulations.

Eskom, the state monopoly, generates the majority of electricity in South Africa (95%) and some municipalities like the Kelvin Power Station in Gauteng generate a miniscule percentage.[132] On the African continent, Eskom generates 45% or about half of electricity supply.[133] Various laws in South Africa regulate the generation of electricity. Among these, the most recent is the National Energy Act passed in 2008 and administered by NERSA. The NERSA is established as the integrated energy regulator for all energy sectors ranging from electricity, petroleum, and gas, and excluding only nuclear energy, which is specially regulated given the broader security implications of nuclear energy.[134]

The object of the NERSA Act is to 'establish a National Energy Regulator for the regulation of the electricity, piped-gas and petroleum pipelines industries.'[135] Sections 3 to 5 provide for the establishment, functions of, and the composition of the NERSA, while s 9 provides for duties of the members of the energy regulator. The funding of the regulator is governed by s 12. The structure and powers of the NERSA may change if proposed electricity

---

[131] At the municipal level, rates charging is further governed by the Local Government: Municipal Systems Act 32 of 2000 s 4(1), 74-75A read with s 27 of the ERA; for general information on South African energy legal framework see Du Plessis (note 15 above); HA Strydom & AD Surridge 'Energy' in Strydom & King (note 93 above) 764, 791-807.

[132] Statistics South Africa *South Africa Energy Statistics* (2008) 7 (2,400 MW from municipalities and 800 MW from private companies). At the SADC level 'the generation mix … was dominated by coal (70%), hydro (15%) and gas (6%).'

[133] Statistics South Africa, ibid; Osec 'Opportunities in infrastructure – a review of South and Southern Africa' (2010) 29 <http://www.s-ge.com/en/filefield-private/files/6543/field_blog_public_files/7952>.

[134] Section 4 National Energy Regulator Act; s 5 National Nuclear Regulator Act 47 of 1999.

[135] Section 2 National Energy Regulator Act.

amendments legislation becomes law.[136] In terms of the proposed amendments the NERSA will lose its regulatory independence to the Minister of Energy.[137]

4.3.1. National Energy Act

The National Energy Act is the overarching energy statute in South Africa. It is complemented by legislation which focuses on each energy sector such electricity, petroleum, gas and nuclear energy legislation. For the purposes of this study legislation relevant to electricity will be explained. The National Energy Act was intended to implement the Energy White Papers through the cleaning up of the policy discordance in the energy sector by bringing structure, focus, and clarity to the regulatory framework.[138] The objects of this Act are to promote integrated energy planning, security of supply, diversity of energy sources, data and information management, transformation, research and commercialisation of energy technologies and health and safety issues in the energy sector, and generally contribute to sustainable development.[139] The National Energy Act provides for fundamental principles that underpin South Africa's energy policy.

In the context of electricity generation, the National Energy Act provides for effective choices to be made on the sources of energy and factors that must guide such decision-making processes. By promoting diversity of sources,[140] the National Energy Act recognises the new role that renewable sources can play to promote sustainability in the energy sector generally and in the electricity

---

[136] Electricity Regulation Second Amendment Bill GN 905 in GG 34870 of 19 December 2011 and the National Energy Regulator Amendment Bill GN 890 in GG 34825 of 8 December 2011.
[137] Doug Kuni argues that the NERSA 'held the promise of an independent body to protect consumers and ensure a reliable supply of electricity for the country. Unfortunately, it has not been able to achieve either since it has never enjoyed real independence free of political interference.' D Kuni 'Challenges in Electricity Regulation in the Republic of South Africa (RSA)' (2013) *Africa Energy Yearbook* 15 <http://www.energynet.co.uk/webfm_send/283>
[138] Memorandum on the objects of the National Energy Bill B52-2008 in GG 31124 of 3 June 2008, 20.
[139] Section 2 National Energy Act 2008.
[140] The Electricity Regulation Second Amendment Bill 2011 proposes expressly to include 'renewable sources' to the definition of 'diverse sources' of energy in s 2(e) of the ERA, to show that diversification must be focused on renewables.

sector specifically. It is an Act influenced by the increasing pressure to focus on sustainable energy from international and national developments.[141]

The National Energy Act can be used to transform the energy industry by promoting low-carbon renewable sources. It constitutes a partial implementation of the Renewable Energy White Paper strategies. The Act requires the Minister in consultation with the Minister of Trade and Industry, the Minister of Labour and the Minister of Environmental Affairs, to 'adopt measures not contemplated in any other legislation *(presumably environmental legislation),* to minimise the negative safety, health and environmental impacts of energy carriers.'[142] This provision ensures that even in continuing its reliance on fossil fuels for electricity, South Africa takes cognisance of the need to anticipate the safety and environmental impacts of relying on fossil fuels. This is sensible given that key environmental laws passed after 1998, if properly implemented could make it difficult for the energy regulators to ignore environmental considerations in regulating energy activities. However, apart from making loft broad policy statements of intent, the National Energy Act falls short of providing a road map towards renewable energy in the electricity sector. There are no specific commitments to a transition towards an energy scenario where renewable sources contribute more in the energy mix. It is argued that the National Energy Act, by not being more explicit in its call for renewables energy, to an extent perpetuates the prominence of conventional sources.[143]

Section 5 of the National Energy Act imposes a duty on the Minister of energy to promote access to affordable, sustainable, and environmentally suitable energy and energy services to all people. This is the foundation of the state's commitment to provide free basic electricity to poor households.[144] Section 5 also mandates the Minister to maintain and build new infrastructure of

---

[141] Renewables White Paper (note 41 above); Climate Change White Paper (note 41 above). This, and the MPRDA, are probably the only energy legislation that seems to be informed by some principles of environmental management in the NEMA, although there is no direct reference to environmental principles as such.

[142] Section 2 (h) and 4 National Energy Act; renewable energy is a sure way to minimise safety, health, and environmental impacts of energy production activities.

[143] The emphasis on affordability, access, cost-effectiveness (s 5(2)) and energy security (s 17) by implication points towards reliance on sources of energy that meet these requirements.

[144] Section 5 (2) (i) National Energy Act.

the provision of energy, a mandate elaborated on in s 18 of the Act. This must be read together with s 17 which gives the Minister powers 'to acquire, maintain, monitor and manage national strategic energy feedstocks and carriers.' Section 7 and 8 establishes the South African National Energy Development Institute (SANEDI) whose function in advising the Minister and implementing energy efficiency programmes is explored further in Chapter 6.3.3 below. Concisely, this main energy statute provides scope for promoting renewable energy and complementary interventions such as energy efficiency and demand side management, supported but good energy resource planning.

4.3.2. The Electricity Regulation Act

The generation, transmission and distribution of electricity in South Africa revolves around the Electricity Regulation Act 4 of 2006 (ERA). Section 2(a) to (g) of the ERA sets out its objects which include 'to achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa', 'promote the use of diverse energy sources and energy efficiency', 'promote competitiveness and customer and end user choice', 'ensure that the interests and needs of present and future electricity customers and end users', 'facilitate universal access to electricity', 'facilitate investment in the electricity supply industry.' Admittedly, these objects resonate with principle of sustainability, inter-generational equity and environmental soundness. However, the energy security, and economic regulation appear dominant when one looks at the detailed provisions of the ERA.

Whilst amended in 2007 to include diverse sources of electricity and the insertion of Chapter IV providing for the Functions and Duties of Municipalities as distributors,[145] the provisions of the ERA do not adequately provide for a legal environment facilitative enough for renewable energy sources of electricity. For instance, s 7(2) read with Schedule II envisages that applicants for any licence are generators, transmitters, or distributors who generate

[145] ERA s 27 to 28.

electricity in a centralised and grid-based electricity system.[146] There are opportunities for renewable energy in the off-grid distributed generation, that suit the rural inaccessible areas where access must expand.[147]

Does this mean that off-grid renewable generation activities need not be licensed unless they are commercial? Similarly, could this imply that any person who wants to erect a wind turbine for his or her own use at a farm or a rural outpost can do so without reference to NERSA and the ERA? Certainly this was not the intention, but indicates how the ERA is fossil-centric in its approach to the regulation of electricity-related activities. While one of the objects of the ERA is to 'promote the use of diverse energy sources and energy efficiency,'[148] this object is not borne out by the specific licensing provisions in the Act.[149] Using the recent amendments to s 34 to enable market entry by IPPs is peripheral to the original regulatory framework of the ERA. The mandate provided by the ERA is unclear and ambiguous on the intention of South Africa to move towards a legal environment where renewable sources of electricity enjoy similar or preferential treatment to conventional sources of energy. Thus the ERA itself becomes an obstacle to renewable energy rather than an enabler.

Nevertheless, in terms of s 34 and s 35 of the ERA, the Minister of Energy, in consultation with the NERSA, determines the need for new generation capacity. NERSA has economic, technical and access regulatory functions under the ERA Act, as the regulator. A particularly key provision is s 4 of the National Energy Regulator of South Africa Act, which delimits the scope of the powers of the NERSA regulators and their functions in the energy sector. The functions relating to the electricity energy sector are important for the purpose of this study. These functions are detailed in s 4 of the ERA, which provides that, the regulator:

(*a)* must-

---

[146] See also ERA s 7(1).
[147] H Winkler *Cleaner Energy Cooler Climate: Developing Sustainable Energy Solutions for South Africa* (2011) 1449.
[148] ERA s 2.
[149] Section 14(1)(r) and (s) do attempt to provide for conditions on types of sources and environmental safety.

(i) consider applications for licenses and may issue licences for -
(aa) the operation of generation, transmission or distribution facilities;
(bb) the import and export of electricity;
(cc) trading;
(ii) regulate prices and tariffs;
(iii) register persons who are required to register with the Regulator where they are not required to hold a licence;
(iv) issue rules designed to implement the national government's electricity policy framework, the integrated resource plan and this Act;
(v) establish and manage monitoring and information systems and a national information system and co-ordinate the integration thereof with other relevant information systems;
(vii) enforce performance and compliance, and take appropriate steps in the case of non-performance.

Clearly, NERSA is the ultimate overall regulator of the energy sector under the oversight of the Minister of Energy on broad policy matters and directions.[150] In practice though, NERSA has not always emerged as the overarching regulator on policy matters; being overshadowed by the Department of Energy.[151]

The Minister of Energy has powers under the ERA to determine whether new generation capacity is required and the sources from which such capacity should be derived. This is in terms of s 34, which provides that the Minister may, in consultation with the regulator:

(a) determine that new generation capacity is needed to ensure the continued uninterrupted supply of electricity;
(b) *determine the types of energy sources from which electricity must be generated*, and the *percentages of electricity that must be generated from such sources*;
(c) determine that electricity thus produced may only be sold to the persons or in the manner set out in such notice;
(d) determine *that electricity thus produced must be purchased by the persons set out in such notice*;
(e) require that new generation capacity must -
(i) be established through a tendering procedure which is fair,

[150] Section 4 National Energy Regulator of South Africa Act.
[151] For instance, the shift from FITs to the REIPPPP strategy for renewable energy, see H Masondo 'Does the Country Still Need NERSA?' (2011) 11 *Without Prejudice* 55; With Municipalities owing Eskom over R4,6 billion and NERSA insisting on low tariffs, Eskom cannot be sustainable. See S Moodley 'Municipalities' R4bn debt to Eskom hindering electricity supply' *Engineering News* (22 January 2015).

equitable, transparent, *competitive and cost-effective*;

(ii) provide for *private sector participation*. *(emphasis)*

In accordance with this provision, the Minister can take the initiative to introduce conditions for renewable energy sources to enter the energy mix. This could be linked to Renewable Energy Portfolio Standards, FITs, open bidding for IPPs, direct or indirect subsidies,[152] Power Purchase Agreements (PPA) and Procurements Standards for government under this section. Section 34 arguably can kick-start a renewable energy revolution in South Africa. The question that remains unanswered is why, apart from REIPPPP, the Minister has not used it effectively? One of the possible explanations is that while IPPs and the private sector were interested in the electricity generation industry, they could not enter the market without legislative certainty. Spurred on by shortages and climate change discourse the Minister has slowly opened this market.[153]

Furthermore, reading s 4 of both the National Energy Regulator of South Africa Act and the ERA, it is submitted that the necessary legal mandate is in place to enable NERSA to take steps to create regulatory space for renewable electricity sources. The NERSA has a mandate to use licensing, rate and price determination as powerful tools to steer the electricity sector towards a certain direction in terms of the primary sources of energy they use.[154] Indeed, it is the regulator that could assist internalise the externalised environmental and health costs of conventional fossil primary sources. Carbon pricing and full-cost accounting for energy production can easily make renewable energy sources more economically sustainable than fossil fuels.

While NERSA has taken its time to use its powers to influence the role of various sources of energy, it is encouraging that some form of regulatory

---

[152] Tomain (note 5 above) 129 (subsidies must be redirected to renewable energy to correct market distortions caused by fossil fuel subsidies); the Energy Challenge for Achieving the Millennium Development Goals 'UN Energy Paper' (June 2005) 11.

[153] In simple terms, this section enables the Minister power to introduce renewable energy.

[154] Profile the growth of the renewable energy industry in South Africa; according to ERA s 14(1) a condition may be imposed on a licence regarding 'the quality of electricity supply and service; …compliance with health, safety and environmental standards and requirements; …the types of energy sources from which electricity must or may be generated, bought or sold.'

framework is developing to promote renewable energy.[155] The regulator developed guidelines for FITs for renewable energy and later in 2009, set the tariffs to be used by IPPs.[156] The introduction of the FITs represented a timely step forward responding to the need to create a favourable environment for renewables in South Africa[157] especially in the face of international pressure regarding climate change and the domestic supply-demand pressures. NERSA moved to action in 2008 due to black outs and serious threats posed to the South African economy by the prospect of further shortage of electricity due to poor planning, which has seen demand outstripping supply.[158] To the renewable energy enthusiasts this was welcome either way as, once developed, the legal framework for renewable energy could assist in showing that renewable energy can competitively be deployed in South Africa given the necessary regulatory support.

To solely frame the renewable energy transition discourse in terms of the country's duty to reduce GHG emission is therefore to fail to appreciate the real drivers of renewable energy policy; namely the imbalance between supply and demand and the economic repercussions of this challenge. While this is good for moving the country towards renewable energy, South Africa must not only move toward sustainable energy under pain of suppressed supply but must also come up with a sustainable energy governance and regulatory framework that recognises the importance of renewable energy in its energy mix.

---

[155] NERSA, Renewable Energy Feed-In Tariff (REFIT) Guidelines (March 2009), the Carbon Tax Paper (note 86 above) and the New Generation Capacity Regulation in terms of which the IPP Procurement Programme (includes REIPPPP) was implemented.

[156] Regulatory Rules on Selection Criteria for Renewable Energy Projects under the FIT Programme, made in terms of Reg 7 of Electricity Regulations on New Generation Capacity GN R721 in GG 32378 of 5 August 2009; Regulatory rules for Power Purchase Cost Recovery, NERSA GN R119 in GG 32964 of 24 February 2010.

[157] M Edkins, A Marquard & H Winkler 'South Africa's Renewable Energy Policy Roadmaps.' Report for the United Nations Environment Programme Research Project, Enhancing Information for renewable energy technology deployment in Brazil, China and South Africa, Cape Town, South Africa (2010) 7.

[158] The persistence of electricity shortages well into 2015 has demonstrated the precarious nature of South Africa's generation capacity.

The ERA requires any person who wants to generate, transmit, distribute or trade in electricity to obtain a licence from NERSA.[159] Any form of a licence under the ERA is applied for following the procedure in s 10. Once the regulator receives an application, a decision must be made within 120 days, subject to any objections received.[160] In issuing a licence, the regulator may impose conditions on the licensee. The conditions may include source specification, quality and supply of electricity, environmental, health and safety standards, compliance with any energy efficiency standards, control of revenue made by the licensee, persons licensee may trade with, the relationship between licensee and end users, and tariffs.[161] The authority to impose these conditions shows that the regulator can use the licensing process to promote renewable sources of electricity. However, any preferential treatment of renewable sources relative to conventional sources must be justified and guided by the principles that underpin the Act.

The fact that s 14 conditions do not refer to environmental sustainability as such, confirms the technical orientation of the energy legislation in the country. The only reference is to environmental safety and health standards[162] but the spirit of sustainability is clearly lacking in this formulation.[163] Even reference to conditions regarding the 'types of energy sources from which electricity must or may be generated, bought or sold'[164] is purely technical and not explicitly meant to promote diversity of sources or renewable sources. These provisions do not force the regulator to promote renewable sources. Technically, the regulator is *not obliged* to promote renewable sources of electricity in the licensing process mandated by the ERA, although nothing stops the regulator from being proactive. This explains why the renewable

[159] ERA s 7(1) read with s 4; s 8 provides for exemption of certain activities from license requirements; however, such activities must still be registered in terms of s 9.
[160] Ibid s 3.
[161] Section 14 ERA; see also NERSA MYPD (note 74 above) setting out the formula applied when considering application for rate increases by generators.
[162] Ibid s 14(1)(s).
[163] It is argued that most SADC states do not have regulatory frameworks that promote clean energy ('The legal and regulatory framework specifically addressing renewable energy in most SADC countries continues to be very limited.'); see Sampa & Kordunsky (note 44 above) 8.
[164] ERA s 14(1).

energy FITs Guidelines of 2009[165] were made in terms of the general National Energy Act rather than the more specific ERA. The two Acts complement each other so this was not a big issue.

However, the imposition of the additional price competitiveness[166] to the criteria developed by NERSA under the FITs Guidelines by the Department of Energy showed who the ultimate *de facto* authority is, in shaping the country's renewable energy policy. The FITs Guidelines were soon abandoned as the legal mandate of NERSA to go that far was questioned, partly to bolster the control by the Department of Energy. According to Samba the FITs were 'abandoned following legal challenges to the lawfulness of the REFIT bidding processes in terms of the provisions of section 217(1) of the Constitution [of South Africa], which requires a public procurement system to be "fair, equitable, transparent, competitive and cost effective.'[167] The legal argument was that the procurement of renewable energy through feed in tariff system would violate the Constitution. It also could potentially be argued to be beyond the mandate of NERSA hence the Department of Energy had to intervene as the procurer of renewable energy. National Treasury was brought in to provide financial support, which was then implemented under the tendering (competitive bidding) system under the REIPPPP.

In 2009 there was policy uncertainty on the FITs that were introduced but never implemented,[168] due to these legal and technical problems.[169] Ultimately,

---

[165] NERSA justified the Feed-in-Tariff Guidelines by saying that 'has the mandate to determine the prices at and conditions under which electricity may be supplied by licence'; see South Africa REFIT: Regulatory guidelines 26 March 2009 GN 382 in GG 32122 of 17 April 2009.

[166] Masondo (note 151 above) 55, 56 arguing that the Department of Energy has effectively usurped NERSA's powers and functions in shaping the renewable policy since the abandonment of the FITs.

[167] R Samba 'To REFIT or not to REFIT' (2009) *Hub Digest* <http://www.satradehub.org/clean-energy/sath-content/newsroom/hub-happenings-articles/hub-digest-to-refit-or-not-to-refit>

[168] Becker & Fischer (note 178 above).

[169] Masondo (note 151 above); IRENA reports that the shift was due to the real usefulness of the REIPPPP to prove actual cost of renewables: IRENA, Africa 2030: Roadmap for a Renewable Energy Future. IRENA, Abu Dhabi (2015) 53. < http://www.irena.org/DocumentDownloads/Publications/IRENA_Africa_2030_REmap_2015_low-res.pdf >

the country has opted for a bidding process under the REIPPPP[170] where IPPs bid to supply a given amount of megawatts within a given pricing model determined by the bidders themselves.

The tariff principles in s 15 of the ERA must be guided by the regulator in determining tariffs and revenue levels and possible conditions under s 14. The principles emphasise economic efficiency, profitability, cost-recovery and cross-subsidisation of customers. This is a clear statement that only economic sustainability is an overriding concern to the regulator. There is no positive provision for negative economic incentives to discourage the use of non-renewable sources for generation, only incentives to promote economic and technical efficiency. From a regulatory perspective, this is what entrenches conventional sources of energy and elevates the view that renewables are expensive and costly to deploy. The need to promote equitable treatment of customers may promote social sustainability (equity) but concurrently be a source of unsustainable cross-subsidisation that dissuades innovation.

4.3.3. The New Generation Capacity Regulations 2009/2011

Recently, the Minister acting in terms of s 35(4) of the ERA promulgated the New Generation Capacity Regulations.[171] The regulations create a framework for the private sector IPPs to enter the electricity generation sector. By definition new capacity means,

> '*(a)* electricity generation capacity other than the capacity of existing generation facilities; *(b)* the electricity derived from the capacity referred to in *(a)*;

---

[170] Approved by the Minister of Energy in consultation with NERSA, see IPP Procurement Programme, 2012 GN 1074 in GG 36005 of 19 December 2012; Renewable Energy Independent Power Producer Procurement Programme <http://www.ipprenewables.co.za>

[171] Electricity Regulations on New Generation Capacity, GN R721 in GG 32378 of 5 August 2009 updated in 2011 through GN R399 in *GG* 34262 of 4 May 2011. In terms of these regulations the Minister has subsequently made a number of procurement determinations namely; IPP Procurement Programme 2012 GN 1074 in *GG* 36005 of 19 Dec 2012; Baseload IPP Procurement Programme GN 1075 in *GG* 36005 of 19 Dec 2012; Medium Term Risk Mitigation Project IPP Procurement Programme GN 1076 in *GG* 36005 of 19 Dec 2012; Gas IPP Procurement Programme GN 732 in *GG* 39111 of 18 Aug 2015; Renewable Energy IPP Procurement Programme GN 733 in *GG* 39111 of 18 Aug 2015; Nuclear Programme: Determination under Section 34(1) of the Act GN 1268 in GG 39541 of 21 Dec 2015; Coal from Cross-Border Projects: IPP Procurement Programme, GN 454 in *GG* 39940 of 20 Apr 2016.

> and *(c)* ancillary services relating thereto, individually or in any combination thereof and including an increase in the electricity generation capacity of existing generation facilities.'[172]

The objectives of the New Generation Capacity Regulations are provided for in Regulation 3 as follows:

1. to facilitate planning for the establishment of new generation capacity;
2. the regulation of entry by a buyer and a generator into a power purchase agreement;
3. to set minimum standards or requirements for power purchase agreements;
4. the facilitation of the full recovery by the buyer of all costs efficiently incurred by it under or in connection with a power purchase agreement including a reasonable return based on the risks assumed by the buyer thereunder and to ensure transparency and cost reflectivity in the determination of electricity tariffs; and
5. the provision of a framework for implementation of an IPP procurement programme and the relevant agreements to be concluded.

It is in terms of these regulations that since 2012 the Minister of Energy in consultation with NERSA has made several determinations. Among these are the Medium Term Risk Mitigation Project IPP Procurement Programme 2012, Gas IPP Procurement Programme 2015, Renewable Energy IPP Procurement Programme 2015, Nuclear Procurement Programme and lastly Coal from Cross-Border Projects: IPP Procurement Programme, 2015. In terms of regulation 2(1), of all these determinations only nuclear can be procure outside the IPP procurement programme. All other new capacity has to be in terms of the IPP procurement programme.

The New Generation Capacity Regulations are not dedicated to renewable energy only but any procurement of new electricity capacity from IPPs. The procurer is defined the person designated by the Minister in terms of s 34 of the ERA (for most REIPPPP determinations the procurer was the Department of Energy itself). Eskom will be the procurer for nuclear programme. Regulation 6 provides that in making a determination the Minister also identifies the quantity of capacity required, the sources to be used, the

[172] Reg 1 Electricity Regulations on New Generation Capacity GN R399 in *GG* 34262 of 4 May 2011.

identity of the procurer, the buyer and such a determination is a contract between the buyer and the procurer (Department of Energy and Eskom for most IPP renewable projects). This contract is consummated through the Power Purchase Agreements (PPA) defined in Regulation 1 as 'an agreement concluded between a generator and the buyer for the sale and purchase of new electricity generation capacity or electricity derived therefrom' [173] and Implementation Agreements (IA) that are concluded at the close of each IPP procurement programme including the REIPPPP. These two agreements guarantee that Eskom will buy all electricity generated by an IPP, and that National Treasury through the Department of Energy shall provide back-up financial support to Eskom to enable it to honour its undertakings to IPPs.

Before making determinations the Minister may commission the buyer (Eskom) to undertake feasibility studies, which assess the technical, financial and operational viability of the programme. This provision and the fact that Eskom is virtually the single buyer have made the renewable energy procurement programme subject to the vagaries of monopoly power. The dilemma is that if the Minister makes a determination in which Eskom is interested, as a generator then the department has to be the buyer who concludes a PPA with Eskom.

The regulations indicate that the government contemplated the development of a system operator separate from Eskom and possibly an independent buyer. However, the reality of Eskom's monopoly as the owner operator of the system and the only possible national buyer meant these terms technically refer to Eskom. However, it is possible for provincial governments to motivate to the minister to be declared as buyers for purposes of procuring electricity from IPPs at the provincial level. The IPP Procurement programme is currently the only way through which an IPP can benefit from the institutional

[173] Reg 9(1) provides that 1) 'A power purchase agreement between the buyer and an IPP must meet the following requirements *(a)* value for money; *(b)* appropriate technical, operational and financial risk transfer to the generator; *(c)* effective mechanisms for implementation, management, enforcement and monitoring of the power purchase agreement; and *(d)* satisfactory due diligence in respect of the buyer's representative and the proposed generator in relation to matters of their respective competence and capacity to enter into the power purchase agreement.'

support provided by the Department of Energy and Eskom in terms of guaranteed returns and dispatch of power. It is however possible for an IPP to independently contract with potential buyers of electricity such as municipalities but this is subject to the powers of the Minister under the ERA and these regulations. This prevents potential negotiations of favourable prices between buyers and IPPs. At the same time, it allows the Department of Energy to remain in control of the national energy policy and future plans.

Together with the Climate Change Response White Paper, the regulations provide a framework in which to upscale the share of renewable electricity in South Africa's energy mix. However, the slow pace at which the regulations are being implemented shows that, without legislative intervention to prune the state monopoly, Eskom, of its grip on the electricity sector,[174] progress would have been negligible. The New Generation Capacity Regulations are therefore the first explicit legal step towards proactive promotion of renewable electricity by the government, although they do not exclusively focus on new generation from renewables.

A proposal is underway to introduce an Independent Systems and Market Operator (ISMO) to take over some of the market control functions from Eskom.[175] The proposal under the ISMO Bill would practically destroy Eskom's monopoly and create a wholesale market model for electricity. The bill sought to create a single wholesale buyer and retailer, which institution was also going to be the market operator and owner of the transmission infrastructure. The ISMO

---

[174] On 15 January 2015 the Minister of Energy acknowledged this tardiness to the Energy Intensive User Group (EIUG) and undertook that 'IPP programmes would be accelerated, and the Minister undertook to address any legislative and regulatory constraints.' < http://www.energy.gov.za/files/media/pr/2015/MediaRelease-Minister-of-Energy-Meets-with-Energy-Intensive-Users-Group-13January2015.pdf>; The slow pace is also evident in nearly all the renewable targets in the Renewables White Paper that have been missed and even the coal build programme (Medupi and Kusile) that is behind schedule. It should be acknowledged that Eskom does claim to be promoting the entrance of IPPs into the electricity sector: see Eskom Holdings SOC Limited (December 2013) *Standard Presentation* 40 <http://www.eskom.co.za/OurCompany/Investors/Presentations/Documents/EskomStandardPresentationDec2013.pdf >.

[175] Independent System and Market Operator Establishment (ISMO) Bill 2011, GN 290 in GG 34289 of 13 May 2011; 'Constraints to "accelerating" IPP programme will be "addressed" ' *LegalBrief Today* Issue No: 3668 (14 January 2015) 'Minister Tina Joemat-Pettersson meets with Energy Intensive User Group' 13 Jan 2015 <http://www.gov.za/minister-tina-joemat-pettersson-meets-energy-intensive-user-group>.

would be also the procurer[176] of energy as opposed to the Department of Energy acting with National Treasury as is currently happening under the REIPPPP.

Furthermore, the ISMO in managing the transmission system, it can possibly unlock competition.[177] Until the ISMO Bill becomes law and the regulatory uncertainties created by the FITs – REIPPPP confusion,[178] IPPs are likely to be cautious in investing in renewable energy in South Africa. Further discussion of the ISMO Bill is unnecessary given that the government has largely abandoned the Bill and the proposals therein may never see the light of day. Eskom remains the key institutions doing the functions that would have been transferred to the ISMO. That is not good for renewable energy as Eskom is unlikely to be forever willing to provide despatch guarantee and grid access to IPPs especially in relation to the use of its infrastructure and the requirement of it to buy energy produced by IPPs. Abandoning the ISMO Bill meant the opening of the electricity market is going to be slower and face some institutional resistance from the incumbent monopoly power utility.

Despite the ISMO debacle and the shift from FITs to competitive tendering; the REIPPPP programme has attracted record investments into renewables.[179] This further illustrates how legal regulation underlies strategies that can remove barriers to renewable energy discussed in Chapter 3.

The existing transmission of electricity is dominated by Eskom[180] and is regulated by the ERA as well as grid codes developed by NERSA and Eskom. Transmission regulation is important as many IPPs face challenges connecting to, and complying with the technical specification and standards of the grid. An

---

[176] ISMO Bill, ibid.
[177] T Sithebe & T Kolobe 'Is Vertical Separation a Prerequisite to Enhancing Competition in the South African Energy Industry?' (2014) 17 *Journal of Economic & Financial Sciences: Special Issue* 527, 534.
[178] B Becker & D Fischer 'Promoting Renewable Electricity Generation in Emerging Economies' (2013) 56 *Energy Policy* 1, 7; A Pegels 'Pitfalls of Policy Implementation: The Case of the South African Feed-in Tariff' in JA Haselip *et al Diffusion of Renewable Energy Technologies: Case Studies of Enabling Frameworks in Developing Countries* (2011) 101.
[179] A Eberhard, J Koeller & J Laigland 'South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons' (2014) 30-33.
[180] As at 2010 operated 28, 236km of transmission network, see Osec (note 133 above) 33.

intervention that is necessary to promote renewable energy is therefore to provide access to the grid for IPPs. Monopoly control over the transmission network that Eskom has invested in can be manipulated to inhibit IPP entry into the sector. NERSA has taken positive steps to ensure that Eskom allows reasonable access to its transmission network to IPPs who meet the grid code specifications and operational requirements.[181] Despite access to the transmission network being an obstacle, many sources of renewable electricity do not require access to the grid for them to be effective. Solar and wind energy are best suited for off-grid distributed application in areas beyond the network.

4.3.4. Managing the distribution of electricity

Municipalities mainly undertake the electricity distribution function but, Eskom still plays a big role in terms of standards.[182] Section 27 of the ERA outlines the duties of municipalities as distributors of electricity, a service for which they may levy charges. Electricity and gas reticulation are areas of municipal exclusive competence under Schedule 5 Part B of the Constitution, read with sections 152,153 and 229. The Local Government: Municipal Structures Act 1998[183] and the Municipal Systems Act 2000[184] further elaborate these functions and duties. The Municipal Systems Act requires municipalities to provide efficient, financially and environmentally sustainable services to its residents.[185] The courts have confirmed that the provision of electricity is part of the legal

---

[181] This is a condition of Eskom's transmission licence; see also South Africa's Electricity Industry, Creamer Media 2010. The detailed grid codes are available at the NERSA website and further elaboration of the technical specifications is beyond the purview of this legal study: < http://www.nersa.org.za/ContentPage.aspx?PageId=275&PageName=Transmission%20Grid%20Code >. A specific code for renewable energy projects was finalised in July 2014: Grid Connection Code for *Renewable Power Plants (RPPs)* Connected to the Electricity *Transmission System* (*Ts*) or the *Distribution System* (*Ds*) in South Africa (Version 2.8, July 2014) (defining the voltage, technology, frequency specifications, among other technical requirements, for projects that want to connect to the Eskom transmission system.)

[182] There are 187 municipal distributors, i.e. 60 % of distribution. Disparities in service quality and rates charged are a perpetual cause of disagreement. That is principally why the six REDs were proposed as alternatives to the myriad municipal distributors.

[183] Local Government: Municipal Structures Act ss 83 and 84(1)(c).

[184] Ibid ss 4(2), 8, 73; see also *Joseph & others v City of Johannesburg & others* 2010 (4) SA 55 (CC) paras 34-37.

[185] Local Government: Systems Act ss 73, 75A.

obligations of municipalities to provide an efficient public service.[186] The Constitutional Court has even pondered whether there is, in fact, an implicit right of access to electricity integral to the right to housing, although not explicitly provided for in the Constitution? Hence in *Joseph* the court stated that:

> [t]aken together, these provisions impose constitutional and statutory obligations on local government to provide basic municipal services, which include electricity. The applicants are entitled to receive these services. These rights and obligations have their basis in public law. Although, in contrast to water, there is no specific provision in respect of electricity in the Constitution, electricity is an important basic municipal service which local government is ordinarily obliged to provide. The respondents are certainly subject to the duty to provide it.[187]

However, in the lower court case reported as *Darries and others v City of Johannesburg and others*, the High Court categorically ruled that, '[t]here is no absolute right of access to electricity, let alone a right to an uninterrupted supply of electricity where the municipal provider is not being paid and where the consumers are not indigent persons.'[188] It is therefore not clear whether there is a clear right to electricity but the judgments seem to indicate that it is not a self-standing right but an appendage of the right to housing.

A number of regulations have been made to regulate the electricity energy sector under the legislation discussed above. Notable and relevant to a discussion on renewable energy integration are the New Generation Capacity Regulations, guidelines on renewable energy FITs, and the regulations on EIA for energy projects. Exercising the powers under s 34, the Minister recently promulgated the Electricity Regulations on New Generation Capacity 2011 and

---

[186] *Mkontwana v Nelson Mandela Metropolitan Municipality & another; Bissett & others v Buffalo City Municipality & others; Transfer Rights Action Campaign & others v MEC, Local Government and Housing, Gauteng & others (KwaZulu-Natal Law Society and Msunduzi Municipality as Amici Curiae)* 2005 (1) SA 530 (CC) para 38 'Municipalities are obliged to provide water and electricity to the residents in their area as a matter of public duty'; para 40 'It cannot be accepted that electricity and water are merely consumed at the property. These amenities are supplied to the property, accessed and consumed by the occupier on the property and are enjoyed by the occupier as part and parcel of the enjoyment of the occupation of the property. What is more, the supply of electricity and water to a property ordinarily increases its value; the consumption of electricity and water enhances its use and enjoyment. Indeed, the consumption of electricity and water by the occupier is integral to the use and enjoyment of the affected property and to its inherent worth.'

[187] *Joseph* (note 184 above) para 40.

[188] *Darries & others v City of Johannesburg & others* 2009 (5) SA 284 (GSJ) para 39.

the Electricity Regulations on the IRP 2 2010, discussed below. The promulgation of these regulations indicates the gradual shift in the regulatory environment with an attempt to promote renewable energy in South Africa's energy mix.

In terms of institutions, the ERA, National Energy Regulator Act, Nuclear Energy Regulator Act and National Energy Act all create an institutional structure for the regulation of the electricity supply industry in South Africa. The key players are the Minister of Energy, the Minister of Public Enterprises through whom the government holds shares in Eskom and other power-related state-owned enterprises, the NERSA, municipalities who are responsible for over 60% of electricity distribution and some minuscule generation. Indirectly, National Treasury, the Minister of Minerals and the Minister of Water and Environmental Affairs are also key functionaries, as their mandates do influence energy policy and regulation. That is primarily the reason why the ministries of Energy and Minerals were one ministry until 2008. In terms of stakeholders, the consumers are central, as are IPPs or the private sector, and energy industry associations. There is still institutional tension among energy related institutions. Perhaps the solution could lie in integrated energy planning now provided for in a more structured way by the National Energy Act in 2008.

4.4. Existing framework for integrated energy planning

The National Energy Act and the ERA[189] both promote integrated energy resources planning. Integrated energy planning is aimed at removing the fragmented approach to energy regulation that was causing serious challenges to South Africa' energy supply and management.[190]

Section 5 of the National Energy Act provides for universal access to affordable electricity by households in South Africa, while s 6 integrated energy-

[189] An amendment bill proposes to give the Minister more powers on tariff and new generation capacity needs determination. Minister will act 'after' and not 'in' consultation with NERSA.
[190] Section 6 National Energy Act.

planning provisions create room for the introduction of a planning tool that can be used to integrate diverse sources of energy into South Africa's energy mix.

The latest IRP 2 of 2010 shows integrated energy planning is a positive step in the right direction in terms of mainstreaming renewable energy, and aligning energy and environmental regulation.[191] Section 7 establishes the South African Energy Development Institute a key institution necessary to gather data and information that is indispensable for the successful implementation of integrated energy resource planning and developing a context specific energy policy that takes into account the country's social, economic and environmental needs and challenges.

The Climate Change White Paper states that it foresees the scaling up of the Renewable Energy Flagship Programme as mandated under the Integrated Resource Plan of 2010.[192] The IRP is produced in terms of the Regulations on New Generation Capacity promulgated,[193] the ERA read with the National Energy Act. The idea is to ratchet up legislative reforms to create an enabling legal environment for private sector IPPs to enter the energy industry. However, the strategies in the 20-year plan depart from empirical plans previously developed before, like the Long Term Mitigation Strategy (LTMS)[194] that had provided for higher targets and a bigger share of renewables in South Africa's energy mix.[195] It appears that the politics of energy had much to do with the final policy adjustments made to the IRP 2010. In this regard, Nel argues that transforming state monopoly utilities is 'complex and risky' and structural reforms to facilitate this transformation are seldom the result of specific models of success, but rather the outcome of the 'socio-political and economic environment.'[196] Current expansion of the Eskom generating capacity under the Build Programme is situated within the IRP 2, yet most of Eskom's programmes

---

[191] IRP 2 as positive.
[192] Electricity Regulations on the Integrated Resource Plan 2010-2030 GN R400 in GG 34263 of 6 May 2011.
[193] Electricity Regulations on New Generation Capacity GN R721 in GG 32378 of 5 August 2009 as amended by GN R399 in *GG* 34262 of 4 May 2011, see Reg 7..
[194] Scenario building Team, Long Term Mitigation Scenarios: Scenario Document, Department of Environment Affairs and Tourism, Pretoria, October 2007.
[195] M Roussos 'Energy Planning and Sustainability' (2012) 64 *Focus* 69, 72.
[196] S Nel 'Transforming the energy supply industry' (2012) 64 *Focus* 15.

and government intervention in the electricity sector depart from the strategies and visions set by the IRP 2 and the Climate Change White Paper.[197] This creates an environment of regulatory uncertainty especially for the private sector that hopes to play a role in promoting renewables. Other shortcomings of the IRP 2, as a national energy plan are that it is based on Eskom's plans and vision, which do not always coincide with the national interests; little emphasis on key strategies to reduce GHG emissions and thereby promote environmental sustainability (energy efficiency, demand-side management and renewable energy); it downplays the importance of renewable energy and entrenches a discounted perception of fossil sources; and it is not properly aligned with the Renewables White Paper objectives and environmental objectives.

The criticisms levelled at IRP 2 are unsurprising given that it is a policy document developed within a framework of energy laws that entrench conventional sources of energy and led by Eskom.[198] It is not an adequate vehicle to promote renewable energy. Institutionally, the actors leading integrated energy planning in South Africa have no enthusiasm in promoting environmental sustainability through renewable energy. Structurally, these actors take little notice of actors championing environmental sustainability in the country – both in and outside government. The IRP 2 therefore is arguably just one of Eskom's long-term plans[199] to ensure that Eskom limps on using conventional sources, while strategically positioning it in the renewables sector once there is sufficient off-take. In this, the IRP 2 furthers the disconnection between environmental sustainability and energy planning in the country.

4.5. Conclusion

The theme of this chapter is that the existing energy policies and laws do not sufficiently promote renewable energy or IPPs who generate energy from

[197] Construction of more coal-fired power plants (Medupi and Kusile); return to service of mothballed plants, reducing investment in renewables, and general policy insinuation that coal is to remain the preferred primary some for the near future.
[198] The enabling legislation, the ERA, does not purport to be a law designed to promote renewable energy.
[199] Essentially extrapolates the Master Plan, and Eskom Build Programme.

renewables. It has been demonstrated that the policy environment was shaped by the belief in the invincibility of conventional fossil fuels. Although policy developments indicate an awareness of the need to promote renewable energy, such policy ambitions have not translated into legal mandates that explicitly direct regulators towards renewable sources. Exiting energy legislation also remains largely geared towards regulating centralised conventionally produced electricity and renewable producers have to fit-into this existing system.

South Africa is at cross roads – on the one hand trying to prove to the international community that it can abide by the principles of the climate change global regime, while domestically contenting with unrelenting poverty and the need to promote affordable socio-economic growth. The electricity regulatory framework is grounded in policy that on paper is sound, yet the actual laws are still steeped in a historical era where conventional energy sources dominate and are regarded as irreplaceable. Poor implementation of the policy leads to poor laws that in turn cannot be effective in practice. However, recent efforts to reform the legal framework spearheaded by NERSA and the Minister are showing small positive results in terms of access to the electricity sector by the private sector. Therefore, despite some lingering uncertainty, the direction that the country has taken is determinable. Developing climate change policy is an opportunity to integrate energy and environmental law, yet policy confusion is impeding progress. With one leg in fossil fuels under the Eskom Build Programme, and another in experimental REIPPPP bidding process, investors remain cautious of investing in South Africa.[200] Proposed amendments to the ERA [201] and the National Energy Regulator Act[202] are not helping matters as they seek to concentrate power in the Minister.

In theory, existing energy laws do provide some room for regulators to implement policies that promote renewable energy, but lack of political will to

[200] This is explained by broader reforms in investment protection legal framework and inward looking investment trajectory.
[201] Electricity Regulation Second Amendment Bill GN 905 in GG 34870 of 19 December 2011.
[202] National Energy Regulator Amendment Bill GN 180 in GG 34825 of 8 December 2011.

implement appears to hamper the robust use of these provisions.[203] The entrenched interests of the fossil fuel industry from coal miners to power generators frustrate policy implementation and inhibit increased use of renewable energy. Renewables are a threat to their industry. This is compounded by the fear that the energy intensive economy may flounder if suddenly shaken by a renewable energy revolution. Proposed reforms to create an independent systems operator and open the industry to independent players show promising signs, yet the law must be clear in protecting the investment by the private sector. Promoting integrated energy resources management and planning is just half the step towards renewable energy. Relative to the energy laws, South African environmental laws are more advanced. However, the contestation between these two fields is a major obstacle to renewable energy.

[203] L Baker & H Wlokas 'South Africa's Renewable Energy Procurement: A New Frontier' *Tyndall Centre for Climate Change Research* (2014) 12 (no political will to move towards sustainability).

Chapter 5
Environmental Law: Enabler of Renewable Energy

5. Introduction: Environmental law as a catalyst

Environmental and natural resources law provide an opportunity to introduce renewable energy into the energy mix in South Africa. Choices and decisions on the use natural resources, pollution control, land use management and environmental impact assessment (EIA) as well as water and biodiversity laws, can influence what primary energy sources are used in a country. Stringent air and water pollution control laws can determine the cost-effectiveness of using fossil fuels or renewable sources. Similarly, land use planning and EIA laws can demonstrate the sustainability of wind and solar energy. A fundamental argument in this Chapter is that despite this potential role and impact of environmental law, it has not yet been used to achieve this effect in South Africa.

The environmental regime in South Africa beginning with the environmental right in s 24 of the Constitutional to sector legislation is an underutilised driver of renewable energy. However, the social and economic needs of the country foster the dominance of conventional energy, instead of low carbon renewable energy. This has given South Africa environmental laws that currently do not sufficiently promote renewable energy. Increased electrification needs cheap electricity, and this has largely been sources from convention sources with little attention to the potential of distributed renewable energy sources.

In this chapter, I analyse *relevant* environmental laws of South Africa with the objective of demonstrating how, if properly used, together with renewable energy policies, they can leapfrog renewable energy into the electricity sector. The analysis is grounded in the environmental right in the Constitution, and then brings in framework legislation and relevant sector specific environmental legislation. This analysis also advances the argument that environmental law being part of the legal superstructure can be used to address the legal and institutional barriers to renewable energy.

5.1. The crucial role of the constitution

The Constitution underlies key themes and findings of this study because it contains the primary mandates for a transition to sustainability of which renewable and low-carbon energy is a part. It establishes the arms, spheres and structures of government, defines their interrelationships and gives them regulatory powers and functions.[1] By doing this, the Constitution directly affects the function and effectiveness of spheres and arms of government in implementing any renewable energy projects. Thus, for instance whether a municipality can procure electricity from IPPs or implement a green energy project is governed by the Constitution and legislation such as the Municipal Systems Act. Importantly, the Constitution is the supreme law of the land[2] and provides an elaborate array of human rights, among which we find socio-economic and environmental rights.[3] Socio-economic rights depend on, among other resources, the availability of natural resources for their fulfilment and enjoyment.[4] The provision of affordable, reliable and safe electricity is an essential element for the fulfilment of socio-economic rights.[5] Therefore, is the provision of other forms of energy not covered in this thesis. The right to housing,[6] healthcare, sufficient food and water,[7] and education largely depend

---

[1] Chapter 5, 6 and 7 read with Schedule 4 & 5 of the Constitution of South Africa 1996.
[2] *BP Southern Africa (Pty) Ltd* v *MEC for Agriculture, Conservation, Environment and Land Affairs* 2004 (5) SA 124 (W) 141A-F; *Director: Mineral Development, Gauteng Region & another v Save the Vaal Environment & others* 1999 (2) SA 709 (SCA) 719C (the inclusion of s 24 rights signalled a decision to end the domination of economic considerations in environmental decision-making. Except that this has not been the case when it comes to mining and energy activities).
[3] Section 24 Constitution of South Africa; L Feris 'Constitutional Environmental Rights: An Under-Utilised Resource' (2008) 24 *SAJHR* 29, 38 (environmental rights are part of socio-economic rights); see also J Glazewski 'The Bill of Rights and Environmental Law' in J Glazewski & L du Toit (eds) *Environmental Law in South Africa* Service Issue 2 (2014) 5-10.
[4] In *Khosa & others v Minister of Social Development & others; Mahlaule & others v Minister of Social Development & others* 2004 (6) SA 505 (CC) para 44 the Constitutional Court confirmed the resources referred to include human and financial resources.
[5] DM Smolin 'The Paradox of the Future in Contemporary Energy Policy: A Human Rights Analysis' (2009) 40 *Cumb. LR 135-179*; AJ Bradbrook & JG Gardam 'Placing Access to Energy Services within a Human Rights Framework' (2006) 28 *Human Rights Quarterly* 389,391.
[6] *Joseph & others v City of Johannesburg & others* 2010 (4) SA 55 (CC), see also Department of Minerals and Energy (Electrification Policy Development and Management) *Socio-Economic Impact of Electrification: Household Perspective* 2008 (showing the importance of energy for many social and economic activities in life).

on energy to support necessary infrastructure and services to promote and fulfil these rights.[8] This dovetails into the connection between energy provision and fulfilment of the MDGs discussed in Chapter 4 above.

Despite this, the Constitution does not directly deal with energy issues altogether.[9] In *Joseph and others v City of Johannesburg and others*, the Constitutional Court shied away from holding that access to electricity is part of the right to housing in s 26(1),[10] holding that supply of electricity is an integral part of the Constitutional duties of a municipality to provide basic municipal services.[11] This duty was termed a public law duty by the court. The *Joseph* case shows that constitutional provisions on the functions and duties of local government could include an intrinsic right of access to electricity, although the lower court in the same case unequivocally held to the contrary.[12] Similarly, international human rights conventions do not explicitly pronounce on electricity or energy, yet research indicates that many poverty alleviating and socio-economic rights initiatives depend on access to affordable energy.[13] This includes commitments to the goals in the MDGs (since 2015 revised and called Sustainable Development Goals (SDGs).[14] Sustainable development remains

---

[7] Section 27(1) (b) of the Constitution.
[8] *Joseph* (note 6 above) para 34 footnote 27.
[9] C Bosman, L Kotze & W du Plessis 'The Failure of the Constitution to Ensure Integrated Environmental Management from a Co-Operative Governance Perspective' (2004) 19 *SA Public Law* 411, 416 ('energy' can be subsumed under 'environment' in Schedule 4 Part A).
[10] *Joseph* (note 6 above) para 32.
[11] *Josephs* (note 6 above) paras 34-35 and 40.
[12] *Darries & others v City of Johannesburg & others* 2009 (5) SA 284 (GSJ) para 39; *Joseph (*note 6 above).
[13] The Energy Challenge for Achieving the Millennium Development Goals, UN Energy Paper June 2005, 3 <http://www.un-energy.org/sites/default/files/share/une/un-enrg_paper.pdf> ('The benefits from providing energy services matter from the viewpoint of human and economic development. Poor people require affordable, accessible and reliable energy services to support their household, economic and social welfare activities.'); Johannesburg Plan of Implementation of the World Summit on Sustainable Development, para 9 < http://www.un.org/esa/sustdev/documents/WSSD_POI_PD/English/WSSD_PlanImpl.pdf >.
[14] OECD/IEA 'Energy Poverty: How to make Energy Access Universal' Special early excerpt of the *World Energy Outlook 2010* for the UN General Assembly on the Millennium Development Goals (2010) 15 <http://www.worldenergyoutlook.org/media/weowebsite/2010/weo2010_poverty.pdf> (while energy not part of the Millennium Development Goals, it is necessary for the achievement of many of the goals).

unattainable without sustainable energy or reliable and affordable energy.[15] The Constitution, by entrenching sustainable development and requiring municipalities to supply services in a sustainable manner,[16] foregrounds the link between renewable *and* sustainable energy, and the environment.

While founded in the common law duty of care and the duty to use one's property while respecting the neighbour's rights; modern environmental law in South Africa derives its contemporary inspiration from s 24 environmental rights in the Constitution,[17] which is embedded in the notion of sustainable development.[18] It is the main modern source of South African environmental legislation and recently the Constitutional Court opined that it is also the source of the key mining law, the Mineral and Petroleum Resources Development Act (MPRDA).[19] The section requires the state, among other things, to promote sustainable development and conservation, while cautioning against overprotection of the environment.

Several court judgments and scholarly writings have interpreted s24[20] hence this thesis does not belabour the point of what the section entails for

---

[15] L Guruswamy 'Energy Justice and Sustainable Development' (2010) 21 *Colorado Journal of International Environmental Law & Policy* 77, 77-78.

[16] Section 152(1)(b) & (d) read with s 24 (b) of the Constitution.

[17] Section 24 provides that 'Everyone has the right –

(a) to an environment that is not harmful to their health or well-being; and

(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that —

(i) prevent pollution and ecological degradation;

(ii) promote conservation; and

(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.'

[18] *Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province, and others* 2007 (6) SA 4 (CC) para 44-45 and 57; *Save the Vaal* (note 2 above) para 20.

[19] *Maccsand (Pty) Ltd v City of Cape Town & others* 2012 (4) SA 181 (CC) para 5; M van der Linde & E Basson 'Environment' in S Woolman & M Bishop (eds) *Constitutional Law of South Africa* 2nd ed (Juta) 50.1, 29 listing the MPRD Act among 28 statutes passed to implement s 24 of the Constitution. Bosman, Kotze & du Plessis (note 9 above) 416 arguing that the definition of 'environment' in the NEMA and 'environment as used in section 24 of the Constitution includes minerals, energy, water and marine resources.'

[20] See cases referred to in note 2 above and authorities therein cited; Glazewski & du Toit (note 3 above) 1-23 to 1-24; LJ Kotzé 'The Judiciary, the Environmental Right and the Quest for Sustainability in South Africa: A Critical Reflection' (2007) 16 *Review of European Community & International Environmental Law* 298-311.

South African generally.[21] Suffice to state that the section has been construed as the mandate for the state to promote sustainable development and forge ahead with the priorities of the developmental state.[22] Secondly, s 24 has been interpreted as both a positive and negative right, creating both positive and negative obligations on the state and the citizens.[23] Third, s 24(a) applies horizontally and vertically as between the state and the citizens; and between the latter *inter se,* while s 24(b) is a peremptory duty on the state.[24] Lastly, the Constitution attempts to balance socio-economic development with environmental sustainability but it does not provide for concrete steps on how this sustainability will be achieved.[25] The task of balancing economic development and environmental conservation is left to the courts. [26] The result is that South African courts have stumbled in the dark attempting to give content to the concepts of sustainable development that underpins s 24 including the interpretation of legislation made to implement s 24.[27]

How and why is s 24 is significant for the call transition to renewable energy? Firstly, the imperative to promote renewable energy can directly be linked to the duty 'to prevent pollution and environmental degradation' and

---

[21] See generally Glazewski & du Toit (note 3 above); van der Linde & Basson (note 19 above) 50.3; Anel du Plessis South 'Africa's Constitutional Environmental Right (generously) Interpreted: What is in it for Poverty?' (2011) 27 *SAJHR* 279-307; LJ Kotzé 'Phiri, the Plight of the Poor and the Perils of Climate Change: Time to Rethink Environmental and Socio-Economic Rights in South Africa?' (2010) 1 *Journal of Human Rights and the Environment* 135-160; L Feris 'Environmental Rights and *Locus standi'* in AR Paterson & LJ Kotzé (eds) *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (2009) 129.

[22] *Fuel Retailers* (note 18 above) para 74-75.

[23] *Hichange Investments (Pty) Ltd v Cape Produce Company (Pty) Ltd t/a Pelts Products & others* [2004] 2 SA 393 (E) 411E-H; Kotzé (note 20 above) 299 & 305; Glazewski & du Toit (note 3 above) 5-12 to 5-13.

[24] Ibid, Glazewski 5-13 (s 24 (a) is capable of vertical and horizontal while s 24 (b) is aimed at the state only- vertical).

[25] Section 24 of the Constitution; *Fuel Retailers* (note 18 above) para 45. It can be argued that the legislation made to implement s 24 provides for these steps for various relevant sectors such as mining (MPRDA), environment (NEMA), and other Specific Environment Management Acts.

[26] This task has been left to the courts to give content to the right, see *BP Southern Africa* (note 2 above); *Fuel Retailers* (note 18 above) para 71-78 and 90.

[27] *BP Southern Africa* (note 2 above) 143; *Save the Vaal* (note 2 above) 719; *MEC, Department of Agriculture, Conservation & Environment & another v HTF Developers (Pty) Ltd* 2008 (2) SA 319 (CC) para 24*; Joseph* (note 6 above) (right to electricity). Recently the courts seem to be drifting towards an informed approach to integrating sustainable development and justifiable economic development, see *Company Secretary of Arcelormittal & another v Vaal Environmental Justice Alliance* [2014] JOL 32582 (SCA) paras 4 and 84.

'secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.'[28] As Dincer argues, '[a] secure supply of energy resources is generally agreed to be a necessary but not sufficient requirement for development within a society.'[29] A development path reliant on fossil-based energy may be viewed as being ecologically unsustainable while a path premised on renewable energy could be viewed as sustainable. This may apparently be true, but on further analysis, a development path based on fossil fuels may very well be sustainable (economically and socially) depending on the view one takes of what the concept of ecological sustainability means in the South African context.[30] That is the reason why even some countries advocating for renewable energy still rely on conventional sources such as coal and gas to meet their own energy and electricity needs.[31]

Despite the conceptual equivocality of sustainable development,[32] the preponderance of evidence points to the view that sustainable development, and thus s 24, is better promoted when the energy mix of a country includes more renewable energy.[33] This is not to say that all renewable energy sources are environmentally benign or sustainable.[34] If an energy source fulfils, or tends to promote the essential components of sustainable development as defined by Sands and Peel,[35] then it is sustainable. One of the reasons why some view the

---

[28] Section 24(b) (i) & (iii) of the Constitution.
[29] I Dincer 'Renewable Energy and Sustainable Development: A Crucial Review' (2000) 4 *Renewable and Sustainable Energy Reviews* 157, 171.
[30] Ibid.
[31] The USA and some EU countries still rely on coal and gas for energy, while some EU states have certainly made huge headway in renewables.
[32] MC Cordonier-Segger & A Khalfan *Sustainable Development Law: Principles, Practices and Prospects* (2004); V Lowe 'Sustainable Development and Unsustainable Arguments' in AE Boyle & D Freestone (eds) *International Law and Sustainable Development: Past Achievements and Future Challenges* (1999).
[33] TB Johansson & J Goldemberg 'The Role of Energy in Sustainable Development: Basic Facts and Issues' in TB Johansson & J Goldemberg (eds) *Energy for Sustainable Development: A Policy Agenda* (2002) 25, 28-29. However, not all renewable energy sources are sustainable – sustainability is not about 'renewability' only.
[34] AJ Wildermuth 'The Next Step: The Integration of Energy Law and Environmental Law' (2011) 3 *Utah Env. LR* 369, 378-379.
[35] Glazewski & du Toit (note 3 above) 1-15 to 1-16 (elaborating on the consensus views on the elements of sustainable development); see also P Sands & J Peel *Principles of International Environmental Law* 3rd ed (2012) 206-207.

economic growth and expansion in China as unsustainable is partly because of its heavy reliance on fossil energy, especially coal, and failing to properly manage the environmental pollution.[36] Nevertheless, it is also paradox that China, leads the pack regarding the rate of deployment of renewables especially solar and wind energy, bankrolled by the fruits of its fast growing economy.[37] It is important that South Africa framed its development agenda within a sustainable development framework that could enable development without disproportionate environmental degradation.

Secondly, the constitutional obligation to prevent pollution and environmental degradation requires South Africa to take legislative and other measures[38] to prevent pollution. Pollution prevention includes promoting clean sources of energy and regulating the use of polluting sources. Power generation and other energy processes are the major sources of air pollution in South Africa. Indoor pollution, partly from inefficient use of biomass and coal burning, has serious health impacts on the population – literally violating s 24(a) of the Constitution. It is submitted that s 24(a) and (b) are legal provisions compelling a transition to sustainable, renewable and low carbon energy sources. This is a direct impact of s 24, as constitutional environmental law on existing energy practices. Despite this clear call to prevent pollution, the energy industry has for some time been legally permitted to pollute the air and resist the promulgation of more stringent air pollution standards.

The Constitution as a whole is not unproblematic however. Constitutional provisions on cooperative governance and the division of legislative competences is an area causing functional and regulatory confusion between energy and environmental law as demonstrated in Chapter 4. 'Energy' and

---

36 N Weidou & TB Johansson 'Energy for Sustainable Development in China' (2004) 32 *Energy Policy* 1225; K He, H Huo & Q Zhang 'Urban Air Pollution in China: Current Status, Characteristics, and Progress' (2002) 27 *Annual Review of Energy & the Environment* 397, 398-399 and 401 ('urban air pollution in China, especially for northern cities, is mainly from coal smoke with particles').

37 International Energy Agency (IEA) World Energy Outlook 2014 – Executive Summary (WEO-2014) 4 <http://www.iea.org/Textbase/npsum/WEO2014SUM.pdf >; E Martinot ***et al*** 'Renewable Energy Markets in Developing Countries' (2002) 27 *Annual Review of Energy & the Environment* 309, 317 and 321.

38 *BP Southern Africa* (note 2 above) 142I-143B; *Government of the Republic of South Africa & others v Grootboom & others* 2001 (1) SA 46 (CC) para 42 on what constitutes other measures.

'Mining' are not listed in Schedules 4 and 5 and the 'Environment' is an area of concurrent national and provincial legislative competence. Energy and mining are therefore deemed to be areas of exclusive national competence, as they are not mentioned at all. Yet the environment by definition includes energy and mineral resources.[39] The Constitution proceeds to split 'Electricity and gas reticulation' and 'Street lighting' between municipal and provincial government.[40] By placing 'electricity and gas reticulation' in the exclusive competence of either the province or the municipality, fundamental problems of implementation and service delivery are created. It is the primary reason why the proposed Regional Electricity Distributors (REDs) never took off after prolonged debates.[41] Furthermore, the Constitution entrenches the perception that energy, mining and environmental issues are separate issues, when clearly they are not.[42] Lastly, this Constitutional division of competences hinders progressive provincial and municipal renewable energy initiatives.

The Constitution also provides for socio-economic right including the rights of children of access to sufficient water and food.[43] The fulfilment of these rights hinges, among other things, on the ability of the country to provide reliable and affordable energy to support the agricultural sector, health and water sectors – the so-called food-water-energy complex or nexus.[44] The nexus approach assists in making planners and decision-makers aware of the multiple interactions and feedback loops in the natural and human systems. The right to sufficient water, access to food, health care, like the MDGs pertaining to

---

[39] Section 1 (1) the NEMA.
[40] Schedule 4 Part B & Schedule 5 Part B of the Constitution of South Africa.
[41] Draft Constitution 17th Amendment Bill B8-2009, GN 869 in GG 32311 of 17 June 2009 abandoned due to disagreement among spheres of government; see also D Isaacs 'Constitution 17th Amendment Bill - Good or Bad?' *Politicsweb* (30 June 2009). <http://www.politicsweb.co.za/politicsweb/view/politicsweb/en/page72308?oid=134659&sn=Marketingweb%20detail >
[42] JP Tomain *Ending Dirty Energy Policy: Prelude to Climate Change* (2011) 13.
[43] Section 27 of the Constitution.
[44] 'The Water-Energy-Food Nexus: A New Approach in Support of Food Security and Sustainable Agriculture' (2014) <http://www.fao.org/nr/water/docs/fao_nexus_concept_web.pdf> ('the Water-Energy-Food Nexus has emerged as a useful concept to describe and address the complex and interrelated nature of our global resource systems, on which we depend to achieve different social, economic and environmental goals.'); G Prasad *et al* 'Towards the Development of an Energy-Water-Food Security Nexus Based Modelling Framework as a Policy and Planning Tool for South Africa' (2012) 1-2 (proposing a model to use the nexus approach in planning for water and energy development).

them,[45] all require energy while energy production processes use water, have health impacts and can disrupt food security (agriculture).[46] For instance decision on whether to allow coal mining (for energy) on land that is agriculturally productive have proved difficult. The health and education sectors require access to electricity and modern technology in remote areas. This could be solved by distributed renewable energy such as solar and wind power to supply electricity to rural health centres. However, the role of municipalities in procuring such energy is Constitutionally constrained.

The South African Constitution clearly provides a basis for the promoting renewable energy that is sustainable, while promoting necessary development. Section 24 is the overarching environmental norm and source of environmental legislation. It can be used to regulate energy related sources of air and water pollution. However, it is also equally apparent that other provisions of the Constitution may be part of the problem of regulatory misalignment and intra-government tensions that impede implementation of renewable energy projects. This is especially the case at the provincial and municipal levels of government. The next section now focuses on how the environmental legislation made as part of s24 (b) of the Constitution impacts current energy practices and how the legislation could be leveraged to promote renewable energy in the electricity sector.

5.2. The National Environmental Management Act and renewable energy

Once the Constitutional dispensation above was firmly in place, the state immediately implemented its s 24(b) obligations to take legislative and other measures to promote, fulfil and protect environmental rights. In 1998, the state enacted the National Environmental Management Act (NEMA), typically called framework environmental legalisation in environmental law discourse.[47] The NEMA is framework legislation because, while implementing s 24 of the

[45] See the discussion of linkages between these MDGs and energy in Chapter 2.
[46] FAO (note 44 above) 6 (referring to these as 'interdependences').
[47] HA Strydom & ND King *Environmental Management in South Africa* 2nd ed (2009) 193 *et seq* (on the nature and functions of framework environmental legislation).

Constitution and providing for the structure of environmental governance, it still leaves micro regulation to specific environmental legislation. The NEMA creates a framework for proper regulation of the different sectors of the environment through media or sector specific laws such as the laws regulating the use of land and water resources, laws governing the control of air, land and water pollution and laws governing waste and land use planning for instance.

As overarching legislation, the NEMA provides for crosscutting overarching regulatory tools and strategies that inform specific regulation in sectoral legislation. In this spirit, the NEMA provides for a set of environmental management principles[48] that are meant to guide environmental regulation, it provides for the institutions that administer and implement environmental laws,[49] these institutions must coordinate within the cooperative governance framework.[50] The NEMA further creates a framework for the implementation of the s 2 principles, integrated environmental management,[51] enforcement of environmental laws,[52] and the power of the Minister to make detailed regulations.

The principle of environmental management in s 2 of the NEMA have the potential, not only to discourage the use of fossil fuels, but crucially to promote renewable energy. These provisions provide indirect incentives and create constraints to the persistence of conventional sources of energy. The NEMA regulates the 'environment,'[53] which includes natural resources used as primary

[48] Section 2 (3) to (4) (a)-(r) of the NEMA; These tools and strategies include cooperative governance, dispute resolution, integrated environmental management and EIA, compliance and enforcement measures and general duty of care provisions.
[49] Chapter 2 NEMA.
[50] Chapter 3 NEMA read with Chapter 3 (s 41-42) of the Constitution.
[51] Chapter 5 NEMA.
[52] Chapter 7 NEMA.
[53] Section 1 provides that 'environment' means the surroundings within which humans exist and that are made up of -
(i) the land, water and atmosphere of the earth;
(ii) micro-organisms, plant and animal life;
(iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.'

energy resources. The NEMA principles lay the foundation and establish a baseline for development that is ecologically[54] sustainable.

From the outset, the NEMA promotes and provides a normative framework that points towards a sustainable energy system in South Africa. Among these principles, we find the principles of precaution, polluter pays principle, public participation, public trust doctrine, cradle to grave or life cycle management, wise use of non-renewable resources, and the principle of prevention.[55] More specifically, the NEMA commands that, among these principles, sustainable development requires:

> (v) that the use and exploitation of non-renewable natural resources is responsible and equitable, and takes into account the consequences of the depletion of the resource;
>
> (vi) that the development, use and exploitation of renewable resources and the ecosystems of which they are part do not exceed the level beyond which their integrity is jeopardised.[56]

There is no other lucid exhortation in environmental law towards renewable energy and the wise use of non-renewable resources. While energy legislation such as the ERA, Nuclear Energy Act and petroleum legislation rarely makes reference to the NEMA principles; it is critical to understand that these principles lie at the centre of initiatives to shift the energy mix from heavy reliance on fossil fuels. The only exception is the MPRDA, and the National Energy Act, which refers to sustainable development and environmental integrity. A key principle,

---

[54] There is a view that s 24 of the Constitution talks of only ecological sustainability which is a narrower concept compared to environmental sustainability, see van der Linde & Basson (note 19 above) 24 ('The meaning of the term "ecologically" has not been adequately considered in our jurisprudence. The danger exists that without placing special emphasis on ecological interests, as the Final Constitution requires, a mere mechanical evaluation of environmental rights, economic rights and social developmental rights will result in environmental interests being "balanced away" during the environmental assessment process of s 24 of NEMA.')

[55] Section 2(3) to (4) NEMA.

[56] Section 2(4) (a) (v) and (vi) NEMA.

sustainable development[57] is at the core of the urge to increase the role of renewables in South Africa's energy mix.

Various scholars and courts[58] have analysed the NEMA principles, their scope and content, but there is scant research on their application and implementation in the energy sector, particularly their potential to promote renewable energy. The NEMA principles identified above are important because they require the energy sector, among other sectors, to be guided by them in extracting energy minerals, energy production, and consumption to prevent significant effects on the environment. Thus, the polluter pays principle requires energy generators to take responsibility for clean-up air and water pollution.[59] The principle equally requires energy resources mining companies to prevent or be accountable for the negative environmental impacts of such mining. Similarly, the precautionary approach requires the energy sector to use more renewable sources given the causal connection between fossil-based energy and climate change.[60] Yet at the same time, they should promote sustainable development, environmental justice and equity by ensuring that every person has access to affordable energy.

The NEMA principles govern the interpretation and implementation of all environmental management laws.[61] An analysis of the energy laws in Chapter 4 above showed that most of these principles have not sufficiently influenced these laws. For instance, the polluter pays principle or the precautionary principle are not evident in South African energy laws that continue to entrench

---

[57] Hence one of the key objects of the National Energy Act (s 2 (l)) is sustainable development of South Africa's economy which resonates with the NEMA principles in s 2(4). The sustainability theme is carried forward to the National Development Plan vision on energy to 2030, 'Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change.' 163.

[58] Strydom & King (note 47 above) 198-199; M Kidd 'The Constitutional Court's dilution of NEMA: *Minister of Public Works and others v Kyalami Ridge Environmental Association and Another'* 2001 (8) *SAJELP* 119; A Paterson 'Fuelling the Sustainable Development Debate in South Africa' (2006) 123 *SALJ* 53; N Rossouw & K Wiseman 'Learning from the Implementation of Environmental Public Policy Instruments after the First Ten Years of Democracy in South Africa' (2004) 22 *Impact Assessment and Project Appraisal* 131-240; *Fuel Retailers* (note 18 above) paras 30,44-45, 51, 60, 63, 79-80; *BP Southern Africa* (note 2 above) 145-146.

[59] Section 2 (4) (p) of the NEMA read with s 5(2) of the Air Quality Act.

[60] Intergovernmental Panel on Climate Change (IPCC) 'Climate Change 2007: Impacts, Adaptation and Vulnerability' Working Group II Contribution to the 4th Assessment Report of the IPCC Intergovernmental Panel on Climate Change' IPCC Secretariat.

[61] For example, s 5(1) and (2) of the Air Quality Act; s 5 of the Waste Act.

conventional energy sources as demonstrated in Chapter 4. Hence, energy-producing companies are not primarily responsible for the health and environmental consequences of water[62] and air pollution from the mining and burning of coal and gas – the key externalities of fossil sources.[63] Rather, these are directly and indirectly borne by society and communities living round coalmines or power plants.[64] The effects manifest as health and respiratory ailments. A failure to embed these principles of environmental management in energy laws is a key symptom of the need to reform existing energy law and develop explicit renewable energy laws. In the absence of internal environmental sustainability control within energy laws, it becomes the remit of environmental law to deal with the adverse environmental effects of extraction and of conventional energy sources. For example, the resistance to more stringent atmospheric emissions standards could be softened if energy regulators imposed these when they approve and licence energy installations.

Unlike the older electricity laws, the MPRDA expressly incorporates the principles in s 2 of the NEMA.[65] This relative degree of alignment of environmental and mining law, albeit much criticised,[66] has enabled environmental law to play a relatively better role constraining mining activities, something not happening with specific energy law. Even then, the NEMA principles are not fully implanted and respected in mining regulations.[67] An interpretation of s 2 of NEMA though, requires that the principles apply to

---

[62] R Spalding-Fecher & DK Matibe 'Electricity and Externalities in South Africa' (2003) 31 *Energy Policy* 721, 727.
[63] AD Owen 'Renewable Energy: Externality Costs as Market Barriers' (2006) 34 *Energy Policy* 632, 636.
[64] For the externalities (pollution) caused by conventional power generation in South Africa, see Spalding-Fecher & Matibe (note 62 above) 723-724; generally, C van Horen *Counting the Social Costs: Electricity and Externalities in South Africa* (1996); C van Horen & A Eberhard 'Energy, Environment and the Rural Poor in South Africa' (1995) 12 *Development Southern Africa* 197.
[65] Section 37 (1) and (2) of the MPRD Act.
[66] Generally, TL Humby 'The Environmental Management Programme: Legislative Design, Administrative Practice and Environmental Activism' (2013) 130 SALJ 60; M Mabiletsa & W du Plessis 'Impact of Environmental Legislation on Mining in South Africa 1' *Constitution and Law IV: Developments in the Contemporary Constitutional State* (2001).
[67] Recent amendments to both the MPRDA and the NEMA seek to promote further synergy and integrated decision-making in these sectors: NEMLA Act, 2014, MPRD Amendment Bill 2014.

energy related activities that may significantly affect the environment.[68] The generation of electricity from fossil fuels, nuclear, gas and the direct use of coal, and biomass, do significantly affect the environment. Fossil fuel burning is the biggest cause of air pollution, and coal mining is the biggest threat to South Africa's water resources. [69] A generous interpretation could be the NEMA principles apply to energy activities even without express incorporation into energy laws.

Secondly, the NEMA regulates energy through integrated environmental management implemented. The environmental authorisation process (popularly referred to as environmental impact assessment (EIA)) provides a good site for promoting renewable energy. A detailed analysis of how the EIA process and general land use planning regulations provide space to promote renewable energy follows in the next section below. The underlying argument is that the application of EIA to energy related activities has not been effective in, not only ensuring that such projects are sustainable, but also in promoting renewable energy. For instance the requirements to consider alternatives to the proposed activities does not feature much in the coal and gas base load, and nuclear procurement programmes.[70]

Third, the NEMA affects current energy practices through its requirements for co-operative governance and integrated environmental decision-making in particular from a planning and diligence point of view.[71] The Department of Minerals and the Department of Energy are departments whose activities involve the *management of the environment* and are therefore

---

[68] Section 2 (1) of the NEMA provides that the principles binds all persons and organs of the state to the extent that their activities may affect the environment. Even s 2(2), which says development must be sustainable, could be construed as applying to any "development" activity. NEMA EIA regulations list many energy related activities.

[69] J Krupa & S Burch 'A New Energy Future for South Africa: The Political Ecology of South African Renewable Energy' (2011) 39 *Energy Policy* 6254; I Dincer 'Environmental Impacts of Energy' (1999) 27 *Energy Policy* 846.

[70] The objectives of Integrated Environmental Management are provided for in s 23 and s 23A of the NEMA discussed in detail in 4.3 below. They include promoting environmentally sound technology and integrated decision-making.

[71] D de Jongh, D Ghoorah & A Makina 'South African Renewable Energy Investment Barriers: An Investor Perspective' (2014) 25 *JESA* 21; W du Plessis 'Legal Mechanisms for Cooperative Governance in South Africa: Successes and Failures' (2005 *SAJELP* 223.

required to prepare and implement Environmental Management Plans.[72] It is surprising that s 11(1) read with Schedule 1 does not regard their activities as significantly *affecting the environment*. To the contrary, the activities of these two departments affect the environment more than they involve management of the environment.

A big obstacle to renewable energy in South Africa is the misalignment between the law and policy plans of the departments of Energy, Minerals, Environmental Affairs, and signals from National Treasury, discussed fully in Chapters 3. Economic obstacles to renewable energy elaborated in Chapter 3 are partly caused by this lack of coordination. Investors remain unclear on what exactly is government policy on renewable energy, to what extent can IPPs rely on Eskom as single buyer of their electricity, the future role of conventional sources and nuclear has become haze each day. This is despite the existence of a long-term energy resources plan the IRP 2. The forecasted procurement of 9 600GW of nuclear can potentially signal stiff competition for renewable energy once such nuclear and current coal power plants come online. Confusion in terms of departmental mandates and the multiple authorisations required can also frustrate investors and project planners interested in the Renewable Energy Independent Power Procurement Programme (REIPPPP).[73]

Fourth, the NEMA's liability provisions affect the energy industry to the extent that it is one of the major sources of environmental pollution. The energy industry may regularly be an enforcement target of the Environmental Management Inspectors (EMI) popularly known as the 'Green Scorpions.'[74] Section 28 imposes a duty of care[75] on any person who has caused or may significant environmental damage, including historical damage to take reasonable measures to mitigate such environmental damage or prevent such

---

[72] Section 11(2) and s 16 read with Schedule 2 of the NEMA.
[73] This has been explored in Chapter 3 (3.3) above.
[74] National Environmental Compliance and Enforcement Report 2013/14, Department of Environmental Affairs, 2014, 49.
[75] Section 28 NEMA; see also generally analyses of the duty in the courts: TL Field 'Realizing the National Environmental Management Act's Potential to Bring Polluters to Book' (2004) 121 *SALJ* 772; TL Field 'Liability to Remedy Asbestos Pollution' (2006) *Journal of Environmental Law* 479.

damage from occurring. Emergency incidents[76] provisions and protection of workers who refuse to do environmentally hazardous work[77] all implicate the electricity energy sector, not only regarding air and water pollution, but also regarding the safety and health of workers in the energy sector.

These provisions can directly motivate the energy industry to consider the compliance costs relative to each primary source of energy, thereby forcing them to consider renewable sources. A choice to use nuclear or coal entails higher environmental compliance costs and therefore becomes a less preferred choice. On the converse, increasing environmental regulation can provide grounds for major lobbying by the energy industry to secure exemptions and concessions such as those manifesting in the Infrastructure Development Act.[78] It is disappointing to note that no serious use is made of s 28 of the NEMA to regulate existing energy practices. Despite extensive air pollution from power plants and coal mining no single case has been brought to enforce the duty of care on energy companies and coal mining companies.

Lastly, the NEMA contains compliance and enforcement mechanisms that can be used to enforce environmental regulations against energy companies. Environmental laws have not been effectively used to force the companies to internalise their environmental costs.[79] Provisions in Specific Environmental Management Acts discussed below provide further illustrations of how environmental law affects current energy practices and the extent to which they can be used to promote renewable energy.[80]

Overall, the NEMA sets the normative framework within which environmental imperatives can be leveraged to gradually shift the energy

---

[76] Section 30 emergency incidence provisions could be useful in the event of accidents and disasters at power installations associated with generation and distribution of electricity.
[77] Section 29 NEMA.
[78] This Act provides for expedited approval processes for Strategic Infrastructure Projects (SIPs), which include energy related projects.
[79] Spalding-Fecher & Matibe (note 62 above) 728-729 (suggesting strategies to internalise the environmental externalities of coal power generation).
[80] These are the National Water Act 36 of 1998, National Environmental Management: Protected Areas Act 57 of 2003, National Environmental Management: Biodiversity Act 10 of 2004, National Environmental Management: Air Quality Act 39 of 2004 and any regulation made in terms thereof (s 1 NEMA).

industry towards environmentally sound[81] and sustainable renewable energy over time. The NEMA cannot certainly force an overnight transition, which may economically be catastrophic for the country, but it must be commended for setting the tone towards sustainable energy.

5.3. Promoting renewables through environmental impact assessment and land use planning

The laws relating to the use of land and property law are closely linked to energy resources and how energy projects are planned, approved and implemented. It is from this perspective that it is argued that planning, EIA and land use laws have a significant role to play in facilitating the implementation of the different types of renewable energy projects. This set of laws determines the environmental soundness of development activities. Section 23A (2) of the NEMA provides that, the Minister may take measures to promote integration of environmental considerations into decision-making, the 'adoption of environmentally sound technology' obviously including renewables technologies, 'promote sustainable consumption and production' and the 'implementation of best environmental practices.' This provision can influence licencing, approval, permitting and siting of energy projects among many other projects as prescribed.

The misalignment between environmental and energy law has resulted in this area being the site of prolonged delays and frustration to particular energy technologies. It is a good example of the institutional fragmentation and political conservatism barrier discussed in Chapter 3. The main land planning laws are now located in the Spatial Planning and Land Use Management Act 16 of 2013, the NEMA, Infrastructure Development Act and Provincial Planning Ordinances.[82] These are only the main and directly relevant statutes, yet a number of other statutes are critical for the successful implementation of a

[81] See s 23A (2) of the NEMA.
[82] For instance, Western Cape Land Use Planning Ordinance 15 of 1985 as amended; Kwazulu-Natal Planning and Development Act 6 of 2008; Northern Cape Planning and Development Act 7 of 1998.

renewable energy projects. Among these we find the National Environmental Management: Biodiversity Act (NEMBA) and its provision of biodiversity and bioregional plans,[83] Air Quality Act, National Environmental Management: Protected Areas Act 57 of 2003 (NEMPA),[84] the National Heritage Resources Act 15 of 1999, the Local Government: Municipal Systems Act 32 of 2000,[85] particularly provisions on various authorisations, and how planning from a local level is supposed to be aligned to regional and national plans. It is at the local municipal planning; land access and zoning level that renewable energy companies face implementation challenges[86] that, with time and better cooperative governance, could be resolved.

Renewable energy companies have reported difficulties with land use and rezoning approvals among a host of other authorisations. This multi-approval process for spatial development remains fragmented in land-use planning sector[87] and is one of the barriers to expeditious approval of renewable energy projects. The problem is compounded by the existence of provincial planning laws that may not always speak to national planning, environmental and energy legislation.[88] An area of planning that best illustrates how environmental planning can be used to promote renewable energy is the EIA or environmental authorisation[89] required in terms of the NEMA. Further authorisations required under several environmental statutes are analysed in subsequent sections of this Chapter.

---

[83] Section 48 NEMBA providing for the need to coordinate and align biodiversity plans and other plans.

[84] Section 48 and 48A restricting mining and other activities in a protected area, which may constrain where mining for primary energy resources may take place and the laying of transmission lines.

[85] Section 24-26 and 35 providing for Integrated Development Plans (IDPs) with which energy related projects must comply with or be aligned to.

[86] A Gets *Powering the Future: Renewable Energy Roll-out in South Africa,* Report prepared for Greenpeace Africa (2013) 21.

[87] Strydom & King (note above) 935.

[88] Exemplified by the institutional conflicts in the *Maccsand; Swartland;* and Mtunzini *Conservancy v Tronox KZN Sands (Pty) Ltd & another* 2013 (4) BCLR 467 (KZD); *McDonald & others v Minister of Minerals and Energy & others* 2007 (5) SA 642 (C); *Boiler Efficiency Services CC v Coalcor (Cape) (Pty) Ltd & others* 1989 (3) SA 460 (C) cases.

[89] A technical term used in the NEMA to refer to the authorisation that is issued after an EIA is approved.

The EIA process is part of the tools used in South Africa to implement sustainable development as mandated by s 24(b) of the Constitution. A number of the activities that are listed in terms of the EIA regulations made in terms of s 24 of the NEMA are directly or indirectly related to the energy generation activities.[90] Once an activity is listed under the EIA regulations a person proposing to undertake such an activity must obtain an environmental authorisation from a designated competent authority[91] after studying the potential environmental (broadly defined) activity. The environmental impact study could be a Basic Assessment[92] for activities that are not complex, the environmental impacts of which are generally known and manageable or small-scale projects. Full Scoping and Environmental Impact Report[93] is required for activities that are large scale, with a large, complex footprint and whose

[90] Section 34(2)(c) ERA. This study was commenced while the 2010 EIA regulations were in force and new EIA regulations were promulgated recently on 4 December 2014 (in effect 8 December 2014) after this study and are thus beyond detailed analysis, however the energy related listed activities did not change and reference are to the new regulations namely; Environmental Impact Assessment Regulations, 2014 GN R982 in *GG* 38282 of 4 December 2014 read with Environmental Impact Assessment Regulations Listing Notice 1 of 2014 GN R983 in *GG* 38282 of 4 December 2014- Item 1-2 list infrastructure for the generation of electricity from renewable non-renewable sources to produce more than 10MW and less than 20MW with a footprint of more than 1 hectare, Item 33- list underground coal gasification; Item 37-expansion of renewable energy facility); Environmental Impact Assessment Regulations Listing Notice 2 of 2014 GN R984 in *GG* 38282 of 4 December 2014- Item 1 and 2- renewable and non-renewable energy projects with more than 20MW output and urban photovoltaic projects; Item 6- 'The development of facilities or infrastructure for any process or activity which requires a permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.'; Item 9- transmission lines above 270 kilovolts; Item 17-21 mining and mineral processing activities; Environmental Impact Assessment Regulations Listing Notice 3 of 2014 GN R985 in *GG* 38282 of 4 December 2014). Other energy-relevant listed activities include the construction of power plants, clearing of land, construction of dams and waterworks, mining processes, generation of electricity, energy transmission infrastructure, generation of waste, abstraction of water and activities that affect areas ring fenced under the National Environmental Biodiversity Act and the National Environmental Protected Areas Act. The 2014 regulations repealed the 2010 regulations namely; Environmental Impact Assessment Regulations GN R543 in GG 33306 of 18 June 2010, read with Activity 1-2, 10, 27 and 29 of Listing Notice 1: List of activities and competent authorities identified in terms of sections 24 (2) and 24D GN R544 in GG 33306 of 18 June 2010; Activity 1-5, 8,15, 25 and 26 of Listing Notice 2: List of activities and competent authorities identified in terms of s 24 (2) and 24D GN R545 in GG 33306 of 18 June 2010.

[91] Section 24N NEMA designates Minister of Minerals and Energy as competent authority for mining and energy related activities and requires the submission of an Environmental Management Programme before such activities are authorised; see also Draft National Renewable Energy Guideline, Department of Environmental Affairs (2013).

[92] Environmental Impact Assessment Regulations Listing Notice 1 of 2014 GN R983 in *GG* 38282 of 4 December 2014.

[93] Environmental Impact Assessment Regulations Listing Notice 2 of 2014 GN R984 in *GG* 38282 of 4 December 2014.

environmental impacts are unpredictable or irreversible. Most large-scale energy related activities (for instance any generation – renewable and non-renewable – infrastructure for output exceeded 20MW with a physical footprint exceeding 1 hectare and transmission lines with over 250 kilovolts capacity) fall under the EIA and Scoping process, which is more extensive, time-consuming and also costly.

As far as energy activities are concerned, the major issues have been the dilatory impact of the EIA process on energy projects.[94] Unlike mining,[95] the issue of who should be the competent authority for energy activities has not been contentious since the separation of the department of energy from mineral resources in 2008. The 2008 electricity crisis led the Minister of Environmental Affairs to create a special dispensation for EIAs relating to electricity generation projects, with far tighter decision-making timelines to expedite the process.[96] This culminated in the recent enactment in 2014 of the Infrastructure Development Act, which aims to expedite approvals and permitting of strategic integrated projects.[97] These include major electricity generation projects.

However, if the Minister could create special procedures of electricity related projects why can the same tight timelines not be applied to all EIA decisions generally? The Minister has powers to make regulations to implement such timelines to promote efficient decision-making. It is apparent that the EIA studies and authorisations required in terms of the NEMA and other environmental legislation provide opportunities for regulators to promote environmentally sound energy technology. This leaves implementation as the major cause of the slow transition to renewable energy as opposed to

---

[94] The new 2014 EIA regulations now including decision-making timelines, see Reg 24 of Environmental Impact Assessment Regulations, 2014 GN R982 in *GG* 38282 of 4 December 2014 which requires a decision to be made on an application within 107 days.

[95] see generally Humby (note 66 above) on the complexity of environmental management of mining under the MPRD Act.

[96] DEAT Guideline on Environmental Impact Assessment for Facilities to be included in the Electricity Response Plan GN 162 in GG 3290 of 24 February 2010 this is now amplified in the Department of Environmental Affairs (2013), Draft National Renewable Energy Guideline, Department of Environmental Affairs; the Infrastructure Development Act 23 of 2014 providing for expedited approval processes of strategic infrastructure projects (SIPs).

[97] Section 17 read with Schedule 1 to the Infrastructure Development Act lists SIPs as including 'electricity transmission and distribution', 'power stations or installations for harnessing any source of energy' projects.

theoretical legislation. However, due to challenges with coherence and institutional fragmentation expounded above and in Chapter 2 and 3, this holds only for environmental law, as energy law itself remain quite technology neutral in terms of the licencing criteria.[98]

5.4. Water, nature conservation and energy

Energy generation activities have serious effects on water that have been extensively documented in the South African context.[99] The National Water Act 36 of 1998 (NWA) is the primary water law in South Africa. In addition to regulating the allocation and use of water rights and resources, the Act is important in relation to energy as it also governs water pollution, the construction of dams, and infrastructure for hydroelectric power. Sections 117-123 of the NWA deal with dam safety and potential impacts of dams used for hydroelectric power generation. Section 21 (h) of the NWA expressly states that 'disposing in any manner of water which contains *waste from*, or which *has been heated in*, any…*power generation process'* is a licensable water use. *(emphasis)* Existing water-cooled power plants will require a licence, included the Koeberg pressurised-water nuclear power plant in Cape Town. Use of water for washing of coal is also licensable.

Furthermore, s 37 (1) (c) of the NWA includes 'a *power generation activity* which alters the flow regime of a water course' among 'controlled

---

[98] See s 14 (conditions of licences) and 15 (tariff principles) for licensable activities identified in s 7 of the ERA are neutral to type of energy source to be deployed unless the NERSA decides to be proactive.

[99] R Inglesi-Lotz & J Blignaut 'Estimating the Opportunity Cost of Water for the Kusile and Medupi Coal-Fired Electricity Power Plants in South Africa' (2012) 23 *JESA* 83; see generally G Olsson *Water and Energy: Threats and Opportunities* (IWA Publishing, 2012); S Goga & G Pegram 'Water, Energy and Food: A Review of Integrated Planning in South Africa' WWF Report 2014; Y Groenewald 'Coal's hidden water cost to South Africa' (study commissioned by Greenpeace Africa, 2012). <http://www.greenpeace.org/africa/Global/africa/publications/coal/CoalsHiddenWaterCost.pdf>; N Wassung 'Water Scarcity And Electricity Generation In South Africa' thesis in partial fulfilment of the requirements for the MPhil in Sustainable Development, University of Stellenbosch. ('[analysing] the impact of coal-fired power on South Africa's water resources, by estimating a water-use figure that extends backwards from the power plant to include water used during extraction of the coal').

activities.'[100] Eskom's pumped storage power plants like the Ingula and Palmiet Pumped Storage Schemes will be regulated in terms of this section. Controlled activities cannot be undertaken without an authorisation granted in terms of s 37(2) of the NWA read together with the NEMA EIA regulations. In addition to such activities being listed under the NEMA EIA regulations, the NWA has internal additional compliance requirements that must be observed for a dam to be constructed.[101] The NEMA EIA authorisation is an additional requirement unless an integrated environmental authorisation is considered in terms of s 24L of the NEMA, which only applies to authorisations in terms of Specific Environmental Management Acts.[102] This excludes the possibility of integrating authorisation across energy and environmental legislation.[103] Some of the provisions focus on the control of water pollution, including thermal discharges from cooling systems.[104]

In terms of pollution control, s 19 provides that every person whose activity may result in water pollution must take reasonable measures to prevent or to remedy such pollution once it has occurred. This provision is important as it imposes an additional obligation on how the energy sector handles water in the process of generating electricity. Several regulations passed under the NWA impact the energy sector directly or indirectly. For instance, Regulations on use of water for mining and related activities aimed at the protection of water resources regulate the storage and transportation of minerals that may affect a water resource regardless of where the mineral is stockpiled. This could include coal stockpiles at a power plant.[105] Similarly, Regulation 7 of the Regulations requires a person in control of an activity, as defined in Regulation 1, to take reasonable measures to prevent contamination of a water resource.

---

[100] Section 37(1)(c) NWA.
[101] Chapter 12 NWA, s 21 read with s 40.
[102] Section 1 NEMA currently this excludes all energy legislation and lists the environmental legislation.
[103] Section 24K and 24L of the NEMA, this illustrates the need for alignment and integration of energy and environmental laws to create an enabling environment for renewable energy.
[104] Section 1 NWA definition of 'pollution' includes 'thermal' pollution from power generation.
[105] Regulations in terms of s 9C (6) of the Water Act, 1956, relating to dams with a safety risk, GN R1560 of 25 July 1986. Regulations on use of water for mining and related activities aimed at the protection of water resources GN R704 in GG 20119 of 4 June 1999 which defines 'activity' broadly in s 1.

Electricity generation processes that result is heated waste water fall under the general authorisation regulations, which exempt certain uses from the need for a water use licence under s 21 and s 22 (1) (a) (iii).[106] This is an undesirable exemption for power plants, although it excludes sea outfall discharges. Other activities that qualify as water uses by power generators not expressly exempt must still be licenced before commencement. The water use licencing process can be used to ensure that existing use of coal to produce power does not significantly result in water pollution. Most water is however used in the process of preparing coal stock feed rather than for cooling – which is a less harmful form of pollution.

The sustainable use of water resources is closely related to conservation of biological resources. Biodiversity laws are important for protection of river catchment areas. Water resources conservation should be integrated with biodiversity protection. Jointly, water and biological resources are under serious threat from mining activities, especially coal mining in South Africa.[107] There are three main pieces of law in this regard, namely the NEMBA, NEMPA and the National Forests Act. For a long time environmental law played second fiddle to mining and resource exploitation laws such as the MPRDA. However, the NEMBA and the National Forest Act provide respective protection for areas outside protected areas and those protected. Furthermore, there is room for creating synergies between biodiversity laws, and energy laws. The MPRDA provides for the possibility of the Minister of Minerals to prohibit or issue moratoriums on the granting of mining permits upon request by stakeholders, and this includes the mining of primary energy resources such as coal, uranium and drilling for natural gas.[108] The Minister also has powers to take measures to remedy environmental damage caused by mining activities. In practice,

---

[106] Reg 3 of GN 399 of 26 March 2004: Revision of General Authorisations in terms of s 39 of the National Water Act 1998 (Act No. 36 of 1998).

[107] FAO (note 44 above); see also M Steele 'Water Hungry Coal: Burning South Africa's water to produce electricity' Greenpeace, South Africa (2012)

[108] Section 49 MPRDA, recently used to slow down mining rights applications in Mpumalanga: GN 287 in GG 34171 of 31 March 2011: Moratorium under s 49 (3) (b) of the Act on Receiving of New Applications for Prospecting Rights in Terms of Section 16. S 47 authorises the Minister to suspend or cancel a prospecting or mining rights if, among others, the licence holder fails to observe environmental conditions of the licence.

however it has proved a big challenge for the Minister to exercise her powers in terms of the MPRDA to protect the environment. It has become the task of civil society and public interest environmental organisation to coax the Minister of Minerals into action and use the relevant sections of the MPRDA.[109]

The majority of complaints that communities and the public have against energy related mining activities come from the mining of coal especially in Limpopo and Mpumalanga provinces. Part of the complaints is that prospecting and mining permits, energy power plants and associated infrastructure are often sited in biologically sensitive areas with little regard to the NEMBA. A serious problem is the authorisation of the mining of coal in environmentally sensitive wetlands, biodiversity rich, water scarce areas and catchment areas.[110]

It can be argued that this persistent of environmental laws and plans by the government, is not by accident. Firstly, the legislation that empowers developmental departments has little provisions to ensure coordination between developmental agenda and the sustainable conservation agenda. Cooperative government is mainly driven by intergovernmental and environmental legislation.[111] Mining and energy laws promote economic activities – they are economic laws and not environmental laws. Hence, the court in *Maccsand* too readily gave itself the conclusion the MPRDA is part of the legislation aimed at promoting sustainable development mandated by s 24 of the Constitution. In fact, the struggle environmentalists are waging currently is against the failure to mainstream sustainable development into their planning and activities by the departments of minerals and energy, among other departments.[112]

The NEMBA provides for national biodiversity planning and the development of various plans from the national, provincial and municipal level.[113] These plans are aimed at ensuring that the promotion of economic activities does not unnecessarily cause damage to the environment and loss of

[109]Letter by the Centre for Environmental Rights (CER) to the Minister of Minerals to act in terms of s 49 of the MPRDA < http://cer.org.za/wp-content/uploads/2011/07/CER-Letter-to-Minister-Shabangu-re-MPRDA-s49-1-Feb-2011.pdf >.
[110] Ibid.
[111] Intergovernmental Relations Framework Act 13 of 2005; Chapter 3 of the NEMA.
[112] See *Save the Vaal* (note 2 above); Treasure Karoo Action Group (TKAG) struggle to prevent unregulated hydraulic fracturing in the Karoo.
[113] Section 38-50 NEMBA

biodiversity. The planning provisions in the NEMBA build on the planning provisions in the NEMA.[114] The planning provisions in environmental legislation also talk to Spatial Development Frameworks (SDFs)[115] and Integrated Development Plans (IDPs) in local government legislation such as the Municipal Systems: Systems Act 32 of 2000.

The NEMBA mandates the development of the National Biodiversity Framework,[116] Bioregional Plans[117] and Biodiversity Management Plans for Species.[118] All these biodiversity plans require consideration of the principles of environmental management in s 2 of the NEMA. The relevance of these plans is that some forms of renewable energy have allegedly been observed to have adverse impacts on animals and birds especially their habitats e.g. wind farms and certain endangered species.[119] Establishment of renewable energy projects should be aligned to biodiversity plans to prevent unnecessary interference with biological resources from the projects. There are provisions[120] in the NEMBA to resolve land use conflicts with regard to development activities (including energy projects) that may pose significant threats to ecologically sensitive biospheres. In addition, as Aronson reports, some types of renewable energy such as wind have been implicated in biodiversity impacts on birds and the local environment.[121] The NEMBA addresses this in South Africa through integrated biodiversity planning that is aligned to the NEMA principles and other land use planning processes such as environmental assessment.

---

[114] Section 12-16 on Environmental Management Plans (EMP) and Environmental Implementation Plans (EIP).
[115] Spatial Planning and Land Use Management Act 16 of 2013.
[116] Section 38-39 NEMBA.
[117] Ibid s 40-42.
[118] Ibid s 43-46.
[119] J Aronson *et al* 'South African good practice guidelines for operational monitoring for bats at wind energy facilities' 1st ed (2014) *Endangered Wildlife Trust (EWT) Report*; 'Strategic Initiative to Introduce Commercial Land Based Wind Energy, Development to the Western Cape Towards a regional Methodology for Wind Energy Site Selection, Report 2: Methodology 1: Criteria based assessment' *Report prepared for the Western Cape Provincial Government* (CNdV Africa, 2006) 5; A Mckechnie 'A darker shade of green: Birds and wind farms ' *Birding briefs,* (2008) <http://www.fitzpatrick.uct.ac.za/africa_birds/ABB13(4)16-17.pdf >
[120] This is done through bioregional planning in a consultative process in s 47 and 48 to ensure alignment of biodiversity plans and spatial planning and land use development plans.
[121] Aronson (note 119 above).

The NEMPA's objectives are the conservation of especially threatened and endangered species and environments by way of fencing them out – that is protecting them from human interference. It is therefore expected that once an area has been declared protected, certain commercial economic activities must be restricted in such areas. The NEMPA regulates the type of economic activities that may be authorised in a protected area depending on the nature or type of protection. Primary energy resources such as coal and uranium are sometimes discovered in protected areas or in buffer zones. Mining can only happen with the approval of the Minister of Environmental Affairs. The result has been authorisation of mining in productive farming areas, environmentally sensitive and protected areas.[122] These invasions of environmentally sensitive areas by mining activities are often justified based on energy security and avoiding electricity blackouts.[123] In so invading biodiversity, the search for coal threatens protected and indigenous forests.[124] Juxtaposed to the need for energy conservation through protected areas fades into insignificance in the eyes of politicians and communities.

Water and biodiversity conservation legislation can enable renewable energy technology by constraining authorisation of non-renewable energy activities in water scarce and environmental protected and sensitive areas. This can only happen where government policy properly balances its economic and environmental interests. The current situation in South Africa as demonstrated in this section is that mining and industrial activities tend to override

[122] Granting of mining rights CoAl of Africa over Mapungubwe, Transworld mining licence (later withdrawn after protest) in Xolobeni. These disputes are well-documented by the Centre for Environmental Rights < http://cer.org.za/programmes/mining/disputes >, recently *Coal of Africa Ltd and another v Akkerland Boerdery (Pty) Ltd* (38528/2012) [2014] ZAGPPHC 195 (5 March 2014).

[123] *Barberton Mines (Pty) Ltd v Mpumalanga Tourism and Parks Agency & others* Case no 43125/13 (North Gauteng High Court (12 July 2013) (mining seeking to proceed with mining in protected area in respect to which the Minister had granted prospecting rights); see also 'Eskom and Coal Suppliers on coal supply security and quality of coal supplied to Eskom' Parliamentary Portfolio Committee Report (2014). Examples include the Ibutho coal mining on the buffer zones of Hluhluwe-iMfolozi game reserve, see *Legalbrief Environmental,* Issue No 401 (Juta 24 March 2015).

[124] KP Kirkman 'Strategic review of the coal mining industry with regard to grassland biodiversity and identification of opportunities for the development of interventions with the coal mining industry to address biodiversity' *Background Information Report No. 4* (SANBI, 2006) 2 ('Smaller [coal mining] companies are regarded as a potential threat to biodiversity conservation because of lower awareness, less resources and lack of capacity').

environmental protection and conservation measures. This study by suggesting integration of energy and environmental laws posits that constraints coming from environmental law must be bolstered by internal sustainability constraints build into energy legislation. Environmental measures are seen as obstacles and this perception changes if the regulatory constraints are internal to energy law. How does this constellation of planning legislation impact on existing energy practices and the development of renewable energy projects, if at all? To what extent do planning laws facilitate or impede renewable energy projects? Do they facilitate or legitimate conventional energy projects? Definitely, the analysis above shows that these planning laws can be used to regulate existing energy practices and also that they can be used to regulate future energy activities.

5.5. Promoting renewable energy through air quality and pollution control legislation

The production of energy generally, and electricity in particular, leaves a trail of waste and pollution in its wake. Building on s24 of the Constitution and the NEMA, in 2000 South Africa produced a White Paper on Integrated Pollution Control (Waste White Paper)[125] that addressed fragmentation and lack of coordination[126] of how waste and pollution were regulated in the country. The Waste White Paper led to the enactment of various media specific statutes,[127] that are now coordinated under NEMA. These statutes together form a system that can effectively be used to prevent pollution in general but specifically from existing the energy practices. Pollution prevention aims at reducing risks to

[125] Department of Environmental Affairs and Tourism, *White Paper on Integrated Pollution and Waste Management for South Africa- A Policy on Pollution Prevention, Waste Minimisation, Impact Management and Remediation*, GN 227 in GG 20978 of 17 March 2000.
[126] The white paper changed the focus from end of pipe regulation (impact management) to pollution prevention, waste minimisation, and regulation across environmental media. This approach reflects a major shift in emphasis from 'control' to 'prevention' 11. For an analysis of this approach and the white paper see LJ Kotze 'Revisiting the South African Integrated Pollution Prevention and Control (IPCC) Regime: A Critical Survey of Recent Developments' (2007) 22 *SA Public Law* 40 and 44 *et seq*.
[127] Namely, the Waste Act and the Air Quality Act.

human health and the environment by seeking to eliminate the causes of pollution rather than treating the symptoms. This section focuses on the extent to which this legislation is useful as an instrument to promote renewable energy.

Activities that cause air pollution begin with the mining and extraction of primary resources, processing and washing, up to the combustion to produce electricity. The National Environmental Management: Air Quality Act 39 of 2004 (Air Quality Act) regulates air pollution, while the National Environmental Management: Waste Act 59 of 2008 (Waste Act) regulates waste. The NWA discussed above regulates water pollution. Inevitably, these Acts therefore affect how existing fossil fuel plants operate as they produce huge amounts of carbon and mercury emissions while using huge amounts of water. Read together, and if integrated in implementation, this suit of statutes provide the greatest potential to regulate pollution and waste from the energy activities. The Air Quality Act ushered in enhanced approaches to air pollution control. These include the obligations to develop a national air quality framework,[128] the establishment of ambient air quality standards at the three spheres of government,[129] prioritisation of hotspots through declaration of priority areas,[130] technology based standards focusing on control of emitters[131] and fuels,[132] planning tools,[133] as well as the licensing of identified activities[134] and expanded criminal liability regime. This is a more nuanced approach than what obtained under the Atmospheric Pollution Prevention Act 45 of 1965, which focused too much on end of pipe regulation. The principles of environmental management and the NEMA spirit is embedded by s 5 of the Air Quality Act, while compliance and enforcement is largely in terms of Chapter 7 of the NEMA.

The Air Quality Act defines 'air pollution' as 'any change in the composition of the air caused by smoke, soot, dust (including fly ash), cinders,

---

[128] National Framework for Air Quality Management in the Republic of South Africa 2012, GN 919 in GG 37078 of 29 November 2013.
[129] Section 9-11 Air Quality Act.
[130] Ibid s 19-20.
[131] Ibid s 23-25.
[132] Ibid s 26-28.
[133] Pollution prevention plans, impact assessment, and monitoring are provided for in s 29-31 Air Quality Act.
[134] Air Quality Act s 21 read with ss 36-43 Air Quality Act.

solid particles of any kind, gases, fumes, aerosols and odorous substances.'[135] By definition therefore, the Air Quality Act can be used to regulate greenhouse gases and atmospheric pollution from existing power plants. [136] Several measures are provided to realise the objects of the Act, which include promoting air quality in the country. Only the measures that are relevant to the energy sector are discussed in this thesis.

The Air Quality Act provides for the declaration of priority areas, areas that require specific atmospheric pollution management measures in terms of s 18 to 20.[137] If an energy installation falls with a priority, area it will also be subject to the management plan developed for that area. For instance, in the Vaal triangle the Lethabo Power Station now has to comply with the Management Plan developed for the area since its declaration in 2006.[138] Declaration of a priority area has potential utility as a way of controlling the siting of electricity power plants. In addition to conditions imposed under the license issued in terms of the ERA, the Air Quality Act provides this further opportunity for environmental authorities to regulate the pollution from power generation activities.

Furthermore, in s 21 the Air Quality Act provides for the listing of activities that may cause significant atmospheric pollution. It further controls certain identified emitters in s 23, while controlling certain fuels in s 26. The identification and listing of activities, technologies, and fuel inputs can be an effective approach to preventing pollution before it occurs. Once an activity, apparatus, or fuel is listed, certain strict procedures must be followed before its implementation or use as the case may be.[139] This includes the setting of

---

[135] Section 1 Air Quality Act building on definition of pollution in s 1 of the NEMA, 'any change in the environment caused by- (i) substances; (ii) radio-active or other waves; or (iii) noise, odours, dust or heat, emitted from any activity.'

[136] Section 50 Air Quality Act - International air quality management and transboundary air pollution control.

[137] For instance, the Vaal Triangle Air shed Priority Area was declared in 2006, see GN 365 of 21 April 2006, Declaration of the Vaal Triangle Air-Shed priority area in terms of s 18 and the Eskom Lethabo power station lies in the area.

[138] The Air Quality Management Plan for the area has specific provision for the excessive emissions from the Lethabo power station Vaal Triangle Air-Shed Priority Area Air Quality Management Plan GN R 613 in GG 32263 of 28 May 2009. (Vaal Management Plan)

[139] Section 22, 25 and 28 Air Quality Act.

specific standards of use and requirements for an atmospheric emission license.[140] In addition, activities that require a licence in terms of the Air Quality Act must be environmentally assessed under the NEMA.[141]

In March 2010, the Minister published a list of activities[142] in terms of s 21, which includes:

- Category 1: Combustion Installations,
- Category 2: Petroleum Industry, the production of gaseous and liquid fuels as well as petrochemicals from crude oil, coal, gas or biomass,
- Category 3: Carbonization and Coal Gasification,
- Category 4: Metallurgical Industry, and
- Category 5: Mineral Processing, Storage and Handling.

All these categories of listed activities directly affect the process of energy generation for electricity, ranging from the stockpiling of coal, infrastructure, burning of coal and gas to generate electricity, and modern clean coal technologies including underground gasification. Any of these listed activities must comply with the minimum emission standards set out in the Regulations.

As is clear from the Vaal Management Plan, electric energy generation from conventional sources is bound to be heavily regulated and the alternatives provided in the plan show the prevalence of renewable energy sources as the way forward coupled with energy efficiency strategies.[143] This illustration shows how the regulation of air pollution can potentially be a vehicle through which renewable energy is promoted while controlling existing use of conventional fossil fuels. Among the listed problem areas in the Vaal Area is included '(i)

---

[140] Ibid s 24 and 27.
[141] Ibid s 38(2) read with Item 2, Environmental Impact Assessment Regulations Listing Notice 1 of 2010, GN 544 in GG 33306 of 18 June 2010.
[142] List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including, health, social conditions, economic conditions, ecological conditions or cultural heritage, GN 248 in GG 33064 of 31 March 2010 (as amended by GN 964 in GG 35894 of 23 November 2012) read with GN 1210 in GG 32816 of 24 December 2009 National Ambient Air Quality Standards (NAAQS) setting out the national ambient standards for carbon monoxide, sulphur dioxide, nitrogen dioxide, particulate matter, lead, ozone and benzene.
[143] Vaal Management Plan (note 138 above).

Biomass Burning, (ii) Domestic Fuel Burning'[144] both activities which also show the consequences of energy poverty or failure to provide clean energy or heating and cooking purposes to the affected areas. This situation is representative of many areas in South Africa where coal is burnt for domestic uses causing heavy indoor pollution leading to health problems adding to the social cost of relying on convention fossil fuels for energy. Small-scale renewable energy interventions could solve some of these problems.

The Air Quality Act contains provisions that, if implemented, can effectively control the fuel types used to produce electricity and where power plants are located and what they may emit into the atmosphere. This integration of emissions and technology-based standards is the surest way to enable South Africa to reduce its GHG emissions and prevent air pollution from the energy activities. The success by Eskom and Sasol to secure postponement of the application of stringent atmospheric emission standards (AES) promulgated in terms of the Air Quality Act[145] to their activities illustrates the negligible impact of the Air Quality Act on existing energy practices. In a statement, Eskom argued that:

> Eskom is committed to safeguarding the environment and has continued to support the maintenance of the World Health Organisation (WHO) standard on air quality in the regions in which we operate…However, a recent change in atmospheric emission licences under the new National Environmental Management: Air Quality Act 2004 has an impact on the performance and compliance of several coal-fired power stations.[146]

This demonstrates the inextricable connection between environmental law (air pollution) and energy laws.[147]

---

[144] Clause 4, Vaal Management Plan.
[145] Listed Activities and Associated Minimum Emission Standards Identified in terms of s 21 of the Act, GN 893 in GG 37054 of 22 November 2013 amending GN 248 in GG 33064 of 31 March 2010.
[146] Reported by S Blaine 'Eskom says some power stations still do not pass air-quality tests' *BusinessDay* (3 April 2014).
[147] Department of Environmental Affairs, Air Quality Management Chief Director Thuli Mdluli recently noted how major air pollution in the energy sector have been abusing and subverting pollution control laws: Sue Blaine 'Firms 'abusing law' on air quality standards compliance' *BusinessDay* (3 April 2014); see also P Vecchiatto 'Molewa lays down law for Sasol and Eskom' *BusinessDay* (29 October 2014).

In response to the application for exemptions the Department of Environmental Affairs noted that:

> It must be noted that the Department of Environmental Affairs has put in place legislative tools to protect the right of all in South Africa to clean air. The National Environmental Management: Air Quality Act 39 of 2004 (Air Quality Act) and its National Framework, Notices and Regulations are such tools. In particular, the objectives of the Air Quality Act are to protect the environment by providing reasonable measures for: (a) the protection and enhancement of the quality of air in the Republic; (b) the prevention of air pollution and ecological degradation; and (c) securing ecologically sustainable development while promoting justifiable economic and social development; and generally to give effect to Section 24(b) of the Constitution of the Republic of South Africa (1996) in order to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and well-being of people. The Air Quality Act, through Government Notice No. 893 (Government Gazette No: 37054) of 2013, published in terms of Section 21 of the Act, prescribes Minimum Emission Standards for various industrial activities which result in atmospheric emissions that have or may have a significant detrimental effect on the environment including health, socio-economic conditions, ecological condition or cultural heritage. It is important to note that the development of the Section 21 Notice constituted elaborate public consultation and participation processes in terms of Section 56 and 57 of the Air Quality Act. All affected stakeholders (industries, non-governmental organizations, etc.) were part of these processes and they made contributions regarding limits that are achievable with the view of upholding the constitutional right of all people in the country to an environment that is not harmful to health and well-being.[148]

The exhortation in this statement by the department shows how the energy industry is central to the effectiveness of any air pollution control interventions. Despite the resolute position of the government the energy companies ultimately secured the postponement they sought. Failure to arrest the rampant non-compliance in the sector poses a serious danger to health and well-being, while a shift to renewable sources of electricity can relieve the energy industry of the need to comply with these seemingly stringent standards.

With regard to waste management, the National Environmental Management: Waste Act provides an integrated legal framework to regulate

[148] Media release note 112 above.

waste in South Africa.[149] The process of producing electricity from coal produces waste coal and ash, which must be properly disposed of, or contained to prevent further consequent air, land and dust pollution. According to Greenpeace International, while most coal ash waste can be reused in cement and concrete production, this happens more in developed countries and in any case, much of the waste is highly radioactive. They argue further that:

> Toxic levels of arsenic, cadmium, chromium and lead can be found in coal-fuelled power plant waste. If these contaminants enter the environment - through dust, leaching into groundwater or from discharges into surface waters - they can contaminate drinking water supplies and accumulate in livestock and crops…Arsenic has been associated with cancer, and cardiovascular and neurological damage. Cadmium has been linked to kidney damage, plus risks of prostate and respiratory cancer. Lead is extremely dangerous for children and has been linked to developmental delay, hypertension, impaired hearing acuity, impaired haemoglobin synthesis, and male reproductive impairment.[150]

No wonder therefore that these wastes must be properly regulated by environmental law to avoid the adverse environmental and health impacts noted above, which if suffered in South Africa would amount to violations of s 24 of the Constitution discussed above.

The Waste Act provides for interventions to promote integrated management of waste. Section 14 allows the Minister to declare national priority wastes types, which must receive priority in management and disposal. Section 16 imposes a general duty on holders of waste to take reasonable measures to prevent environmental damage. Section 19 provides for the listing of waste

---

[149] Act 59 of 2008, section 4 (1) (b) which used to exclude mining residue deposits and stockpiles was amended by s 18 of the National Environmental Management Laws Amendment Act 25 of 2014 (effective 2 September 2014) read with National Environmental Management: Waste Amendment Act 26 of 2014 to now include residue deposits and stockpiles as newly defined and regulated in terms of the new s 43A. Radioactive waste regulated under the Hazardous Substances Act, the Nuclear energy Act, National Nuclear Regulator Acts remains an exclusion as per s 4 (1) (a) Waste Act.

[150] 'Power Plant Waste' Greenpeace International, 15 April 2010 <http://www.greenpeace.org/international/en/campaigns/climate-change/coal/Power-plant-waste>; see also 'Contaminated Coal Waste' Natural Resources Defence Council (NRDC), 3 December 2009 <http://www.nrdc.org/energy/coalwaste> noting that coal waste remains a problem even in the USA and that the Environmental Protection Agency has repeatedly failed to effectively regulate it.

management activities that require a license.[151] Section 21 provides for the general requirements of waste storage.[152] Until the 2014 amendments, a major defect of the Waste Act was that its prudent measures did not apply to mining waste (residue stockpiles) and nuclear waste. Since September 2014 these now apply to mining waste and residue stockpiles but still not nuclear waste.[153] The mining sector is no longer left to set its own self-regulatory and often weak standards. Yet the integration remains incomplete as long as the Minister of Mineral Resources continues to be in charge of environmental management of mining activities. Consequently, the mining and processing of fossil fuels will remain cheaper than renewables.

An underestimated possible use of the Waste Act is the promotion of waste-to-energy generation plants to produce electricity while concurrently disposing of waste in an environmentally sound manner. The technology is still prohibitively expensive in South Africa but there are pilot plants that indicate the potential of this solution.

5.6. Implications of environmental law for renewable energy

The regulatory framework designed around the NEMA and sectoral legislation could be effective in controlling the use of fossil fuels that do not meet certain quality and emission standards. This suit of environmental laws can be used to set and ensure compliance with strict, but sustainable, technology standards for electricity generation infrastructure. The concept of sustainable development and the NEMA principles of environmental management, as augmented by liability measures and regulatory provision in the Air Quality Act and the Waste Act should suffice to prevent unlawful pollution. However, air pollution from

[151] Licenses are applied for under s 45 of the Act and the List of Waste Management Activities that have, or are likely to have a Detrimental Effect on the Environment, GN 718 in GG 32368 of 3 July 2009- lists waste management activities including among others, the disposal of any hazardous waste on land and the storage of waste in excess of 100m^3.
[152] Section 21 'Any person who stores waste must at least take steps…to ensure that – (e) pollution of the environment and harm to health are prevented.'
[153] see note 149 above.

existing installations remains a problem. Water pollution from coal mined for primary energy stock feed remains a challenge.

The EIA process and licencing processes, among other environmental regulatory processes, can be used to promote renewable energy, and make fossil fuels costly. The primary objective behind these processes is to ensure that regulated activities are only approved when their sustainability has been assessed and when they do not pose significant risk to the environment. Relatively, renewable energy projects should receive better sustainability rating than a fossil or nuclear powered plant, for instance. Despite this environmental regulatory framework air and water pollution persist. Admittedly, some level of regulatory impact on current energy practices is visible, but it is inadequate to promote a gradual transition to renewable energy. What is wrong with the design or implementation of these environmental controls and energy laws, if anything? In the context of renewable energy, could it be the case that the response strategies and measures adopted in these statutes is inappropriate? This latter question is pursued in Chapter 6, but this chapter showed that environmental law is important in driving the increased use of renewable energy.

5.6.1. Conclusion: *Regulating for a transition to renewable energy*

Environmental law can be an enabler of renewable energy as it regulates access to and use of natural resources including primary energy sources such as minerals, water, solar, wind and biomass. It affects the energy industry by controlling of all forms of pollution and the energy industry is a key contributor to air, land and water pollution. Existing environmental law, like current energy law, can either legitimise conventional fossil fuels; but unlike energy law, environmental law can function positively. Indeed, it has been argued that environmental law as currently framed may be neutral to energy law, which is a problem in itself. That is how it entrenches conventional energy sources. The on-going contestation of the new ambient emission standards by the energy

industry[154] shows that the environmental regulator in South Africa has discovered the usefulness of air pollution law as a disincentive for conventional fossil based electricity. Increasing air quality regulation will see renewable energy becoming cheaper than fossil produced electricity, barring further subsidisations by the state.

Given that 'energy policy and law sits at the intersection of environmental law, natural resources law and regulatory law,'[155] it is imperative that these areas truly converge in a regulatory sense, to enable integrated planning and regulation of energy resources. On the converse, environmental law also stands to benefit from synchronisation with energy law, as the latter can definitely promote environmental objectives through the potential of renewable energy to meet pollution control and climate change objectives.[156] Environmental law especially water, air and land pollution legislation present real spaces for creating norms and standards that could promote renewable energy by discouraging the generation of fossil electricity which reduces a lot of environmental pollution. The polluter pays principle creates room for the internalisation of currently discounted costs of fossil fuels. Integrated environmental management, and the EIA process provide opportunities to promote renewable energy that could pass the sustainability test. The outcry by the energy industry after the promulgation of new air quality standards and the requirements for all power generation plants to meet these standards show the potential of air pollution control measures to change the mind-set of fossil based power. In the long term, this can change the attitude of power generators to renewable, and rather they can see renewables as a cheaper option given the compliance cost involved. This could happen with effective coordination of the governance institutions, regulators and government departments involved, as well as better regulatory alignment.

---

[154] See further, CER Case Watch <http://cer.org.za/programmes/pollution-climate-change/legal-proceedings >

[155] F Bosselman et al *Energy, Economics and the Environment: Cases and Materials* 2nd ed (2006) 5.

[156] LL Davies 'Alternative Energy and the Energy-Environment Disconnect' (2009) 46 *Idaho LR* 473, 477; PD Park *Energy Law and the Environment* (2002) 12 (arguing that regulation of the energy sector in the UK evolved through environmental regulation of pollution).

While law is not a silver bullet, it is clear that in the transformation of the South Africa energy sector, law is going to play a central role in creating a certain framework for renewable energy to enter the energy market. In this process, law will be called to address a number of the barriers identified in Chapter 3. These include the economic market related, legal, institutional obstacles. Law can achieve this either through direct regulation or indirectly creating regulatory incentives for the transition or disincentives for the status quo. The renewable energy industry is one where it can be argued that a market will not grow on its own (free market argument), but will need to be created through legal regulation. Undoubtedly, there are other impediments to this transition to a green powered economy that lie outside the purview of legal regulation, where social and economic regulation will play a role to change behaviour, attitudes and other variables that inform how people make energy choices. However, the current reality in South Africa is that there is are no choices to be made given the monopoly and entrenchment of fossil fuels in energy. Consumer choice will only become a reality with more private sector payers and liberalised energy market which is not dominated by one monopoly.

Chapter 6
Regulatory Tools to Promote Renewable Energy

6. Introduction

> 'Governments have the power to create markets and policies that accelerate development and deployment of clean energy technologies, yet the potential of these technologies remains largely untapped'[1]

Overall, the obstacles analysed in Chapter 3 and the current state of energy and environmental laws discussed in Chapter 4 and 5 above, are all delaying the transition to an energy profile that gives prominence to renewable energy sources. This does not negate some positive legal provisions that were identified as possible ways to promote renewable energy. However, other countries have come up with various legal, economic and policy strategies to respond to and overcome some of these obstacles. It is clear from an illustrative survey of the jurisdictions that are regarded as paragons of good renewable energy deployment[2] that, ultimately everything boils down to effective legal and policy frameworks that creates incentives and enable energy companies and consumers towards renewable sources.[3]

The unequivocal dilemma is that most of the successful countries that are relatively developed, have access to the technology and finance, and demonstrated political will to champion renewable energy.[4] These countries cannot readily be compared to developing countries or emerging economies, including South Africa, given the vast discrepancies between their economic status and advancement in terms of research and development in renewable energy technology.[5] Hence, a detailed comparative analysis serves no useful pedagogical purpose in such a context. A mistaken assumption is often made

---

[1] International Energy Agency (IEA) *Tracking Clean Energy Progress*, IEA Input to the Clean Energy Ministerial, OECD/IEA (2013) 7.
[2] These include Germany, Denmark, Spain and Brazil.
[3] Energy Efficiency (EE) and Demand Side management (DSM) are critical for enabling a transition at lower costs as these strategies enable the energy system to bear the strain of transition by reducing demand.
[4] Hence Sovacool's comment that renewables are economically easy, but politically challenging, see BK Sovacool 'Renewable Energy: Economically Sound, Politically Difficult' (2008) 21 *The Electricity Journal* 18-29.
[5] Could comparatively provide best practices but certainly not thresholds or benchmarks for developing countries to plan against.

that what Germany and Spain[6] accomplished could very well be accomplished in South Africa or other developing country – context matters.[7] Indeed several assumptions underlie such comparison that defeats the purpose of scientific comparative analysis. While definitely developing countries and South Africa can learn so much from the successful deployment of renewable energy technology in the electricity sectors in Europe, a number of qualifications[8] must be set out from the outset in defining the potential for South Africa to take the same technological and regulatory leap.

This Chapter analyses the possible legal and policy options available to South Africa to overcome the barriers to renewable energy and the legal mechanisms to promote increased use of renewable energy. Other things being equal, South Africa should lead Sub-Saharan Africa in this revolution. The social, economic, and political context of South Africa and Sub-Saharan Africa must always be considered when this argument is advanced. The messages on where South Africa is going discussed in this Chapter are derived from Ministerial policy statements, legal and policy documents that authoritatively state the government's policy positions and directions.[9] These are counterbalanced with private actors' contributions to development policy

---

[6] L Du Toit 'Promoting Renewable Energy in South Africa Through the Inclusion of Market-based Instruments in South Africa's Legal and Policy Framework with Particular Reference to the Feed-in Tariff.' Thesis presented for the degree of PhD at the University of Cape Town (2014) 171-172 and 282.

[7] M Mendonca *Feed-in Tariffs: Accelerating the Deployment of Renewable Energy* (2007) 76 ('Encouraging the spread of renewables in developing countries presents a different set of challenges to those in industrialized countries. The unique social, political and economic profile of each developing country will affect the feasibility of different policy measures.'); contrast PK Oniemola 'Integrating Renewable Energy into Nigeria's Energy Mix through the Law: Lessons from Germany' (2011) *Renewable Energy Law & Policy Review* 29,30 (drawing lessons from the Germany success for Nigeria's renewable energy through feed in tariffs). A Gets *Powering the Future: Renewable Energy Roll-out in South Africa* Prepared for Greenpeace Africa (2013), 28 (making the same assumptions on the possibility of following the Germany example).

[8] Y Omorogbe 'Regional and National Frameworks for Energy Security in Africa' in B Barton *et al* (eds) *Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (2004)125 (illuminating the use of energy security as a driver for alternative energy but noting that the understanding of energy security is quite different in developed countries and in the African context).

[9] Sources of government policy trajectory include the New Growth Path, the National Development Plan, energy related White Papers, Integrated Resource Plan (IRP2), Climate Change White Paper, Proposed Carbon Tax Policy, Beneficiation Strategy, among other policy position documents.

statements from stakeholders.[10] These stakeholders are reflective of what one can obtain through discursive qualitative interviews, as they are the official policy statements and responses to government policy propositions by the stakeholders.[11] Comments on the Integrated Resource Plan 2, Climate Change Response White Paper, REIPPPP, proposed Carbon Tax, and legislative amendments to energy legislation all essentially provide the industry and civil society positions regarding where the country should go in deploying renewable energy. Sporadic references will be made to countries that have used some of the strategies but no detailed comparative analysis is intended for the reason stated above.

The legal and policy instruments strategies tried elsewhere have met with different success rates in different jurisdictions, often showing the importance of the social and economic context of regulation.[12] Thus, for instance, while FITs are claimed to be behind Germany,[13] and Spain's[14] successful renewable energy revolutions, the same intervention may not be as successful in South Africa, or other developing countries. Even in other developed countries, the FITs produced mixed results.[15] South Africa created a legal framework for FITs but later opted for implementation through a competitive bidding system, which leaves price determination to bidders.

---

[10] For instance, Greenpeace- F Adam 'Comments on the IEP' 2013; Earthlife Africa, Johannesburg 'Draft IEP Report' (2013); The availability of these research papers and policy commentary obviated the need for interviews with these stakeholders.

[11] This was one reason why policy review was preferred ahead of field discursive interviews to gather the views of interested and affected parties in the renewable energy sector and policy developments in the sector. There is currently on-going policy development and inputs by stakeholders, which made fieldwork unnecessary. The author also attended some of the workshops organized by the energy department and key players to gather information first hand. These include the Wits Energy Symposium, organized by BP Shell to presents its BP Energy Outlook in 2012 and 2013, Renewable Energy Africa Conference in 2012, tracking parliamentary budget speeches, among others.

[12] Mendonca (note 7 above*)* 43 and 58. Detailed study of the proposed carbon tax is beyond the scope of this thesis but it is an area worth further research.

[13] L Butler & K Neuhoff 'Comparison of Feed-in Tariff, Quota and Auction Mechanisms to Support Wind Power Development' (2008) 33 *Renewable Energy* 938, 959 for a detailed comparative studies to which interested readers are directed.

[14] LL Davies & K Allen 'Feed-in Tariffs in Turmoil' (2014) 116 *West Virginia Law Review* 938, 999-1000 (demonstrating the effectiveness and pitfalls of feed-in tariffs through case studies of Germany, Spain and South Korea).

[15] Mendonca (note 7 above) 53 and 103 provides another detailed comparative study of the relative success and challenges of feed in tariffs in various countries.

Most interventions analysed in this chapter directly promote renewable energy. However, other policy measures that indirectly promote renewable energy, such as measures aimed at controlling GHG emissions, energy efficiency, and economic or market-based tools are also discussed. The indirect interventions serve multiple cross-sectoral regulatory purposes of which the transition to renewable energy is just but one potential outcome. Nevertheless, framing the instruments to enable the transition to renewable energy within the sustainable energy discourse is useful as it provides a better rationale for why countries should move away from conventional sources of energy. As noted by various courts[16] and academics the principle of sustainable development underpins the environmental regulation in South Africa.[17] Measures to promote energy sustainability are likely to resonate with the government policy directions and regulatory objectives.[18] This can only happen if there is sufficient coordination of integrated policy planning across government sectors.

Given the focus of this thesis on South Africa, strategies that are clearly not applicable to South Africa's social and economic context are not discussed in detail.[19] For example, interventions to promote nascent types of renewable energy technologies that are not yet commercially viable in South Africa have been excluded from extensive analysis. Such sources include geothermal and tidal wave energy for instance. As Beck and Martinot aptly observe:

> The need for enacting policies to support renewable energy is often attributed to a variety of "barriers" or conditions that prevent investments from occurring. Often the result of barriers is to put renewable energy at an economic, regulatory, or institutional disadvantage relative to other forms of energy supply… Many of these barriers could be considered "market distortions" that

---

[16] *Maccsand (Pty) Ltd v City of Cape Town* 2012(4) SA 181 (CC); *Fuel Retailers Association of SA (Pty) Ltd v Director-general Environmental Management Mpumalanga and Others* 2007 (10) BCLR 1059 (CC); *BP Southern Africa (Pty) Ltd v MEC Agriculture, Conservation & Land Affairs* 2004 (5) SA 124; *Director: Mineral Development, Gauteng Region & another v Save the Vaal Environment & others* 1999 (2) SA 709 (SCA).

[17] J Glazewski & L du Toit (eds) *Environmental Law in South Africa* Service Issue 2 (2014) 1-16 – 1-18; L Feris 'Sustainable development in Practice: *Fuel Retailers association of Southern Africa v Director-General Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga province'* (2008) 1 *Constitutional Court Rev* 234-253; National Development Plan 2030: Our Future - Make it Work (2011) 65.

[18] As articulated in the Energy and Renewables White Papers and the National Development Plan.

[19] I also eschew technical challenges that are the terrain of electrical and energy engineers.

> unfairly discriminate against renewable energy, while others have the effect of increasing the costs of renewable energy relative to the alternatives. Barriers are often quite situation-specific in any given region or country.[20]

Understanding the social, economic and cultural context of energy is thus crucial to designing effective and appropriate regulatory response mechanisms.

The regulatory responses are analysed following the categorisation by Painully into institutional, economic, or regulatory.[21] Under each of these broad response categories, there are various tools or mechanisms that have been developed in various jurisdictions and South Africa is experimenting with some of them. The proposed responses include legal reforms to create legal certainty and the reorientation of energy and environmental law within the constitutional framework of socio-economic and environmental rights and cooperative governance. Some barriers call for effective implementation of integrated energy resources planning and the creation of an energy market by opening the sector to IPPs through working procurement processes supported by economic or market based instruments. The latter are receiving impetus from climate change mitigation and adaptation global and local developments, such as the carbon tax proposal. Lastly, the need to produce more energy comes from increasing or inefficient use if energy hence responses from the demand side are critical.

6.1. Potential legal tools to promote renewable energy

The transition to renewable energy depends on the creation of an enabling institutional and legal environment[22] that can facilitate rather than hinder initiatives to move towards renewable energy. Institutional and legal obstacles

---

[20] F Beck & E Martinot 'Renewable Energy Policies and Barriers' (2004)5 *Encyclopedia of Energy* 365, 366 (most of these barriers have been elaborated on in Chapter 3 above).
[21] JP Painuly 'Barriers to Renewable Energy Penetration: A Framework for Analysis' (2001)24 *Renewable Energy* 73, 79 (categorisation of barriers and responses thereto).
[22] A Gets (note 7 above) 22 ('Legislative barriers are one of the most difficult obstacles that renewables projects, globally, have to face. Uncertainty in legislation in South Africa has made progress of significant renewable energy deployment frustratingly slow').

are dealt with together as they are inextricably intertwined and need an integrated approach to effectively respond to them.

Furthermore, analysis indicates that the economic environment plays a crucial role in either promoting or stifling a smooth transition to renewable energy.[23] In this respect, economic responses cover a broad range of instruments such as market regulation (creation and control), subsidisation of energy sources (positive incentives that take different forms from quotas, feed in tariffs, auction based bidding system, renewable portfolio standards), and carbon taxation (negative incentives).[24] The economic responses take various permutations from country to country, however the intended outcome is the same, namely to create incentives for renewable energy while discouraging investment and continued reliance on conventional fossil sources of energy.[25]

Lastly, I look at a range of indirect regulatory tools that have potential to indirectly influence investment decisions and energy choices although this may not be the primary objective of such laws and policies. In this respect climate change, fuel or carbon levies or taxes and environmental sustainability laws have proven valuable as indirect influencers of energy law and choices.[26] But in the electricity sector there is no choice to talk about, unlike in the liquid fuels sector where there is a measure of choice on different types of fuel and type of motor vehicle to purchase. Consumer targeted economic instruments can only change attitudes if the consumer has alternatives and substitutes.

---

[23] Energy demand and the need for more electricity are usually shaped by the industrial profile of a country. South Africa's economy is energy intensive and that has a bearing on how flexible the energy mix can be.

[24] See part 6.3.1 below and generally

[25] C Karakosta *et al* 'Renewable Energy and Nuclear Power Towards Sustainable Development: Characteristics and Prospects' (2013)22 *Renewable & Sustainable Energy Reviews* 195 ('Many of the promising RES are boosted by a favorable policy framework. Either in the form of a market support scheme (e.g. feed-in tariff) or as an instrument for climate change policies (e.g. CDM), most of the RES can receive direct or indirect financial support for their further deployment.) see also generally AR Paterson 'Incentive-Based Measures' in AR Paterson & LJ Kotzé *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (2009) 296, 314 and 318 (differentiating the positive and negative incentives and analysing some examples of such).

[26] For instance, in the EU renewable energy is driven by the need to cut greenhouse gas emissions more than energy security concerns. Environmental law has emerged as an important tool to discourage investments in fossil sources. This may affect energy security in the short run but in the long-term promote renewable energy sources.

The South African government in supporting Eskom's application for support from the World Bank acknowledged the existence of barriers and clearly undertook to:

> [identify] barriers and enablers to its energy strategies and objectives as part of the Integrated Resource Plan (IRP). Government will take the necessary steps to address the enhancement of enablers and the removal of barriers to scale up the current set of energy efficiency and renewable energy programmes and implement future actions. Work with the World Bank in this regard has already commenced…Aside from the current IBRD application, South Africa also intends resubmitting a $250m application to the Clean Technology Fund (CTF) for renewable energy under the co-financing structure with Multilateral Development Banks.[27]

Whether direct or indirect, most of the legal mechanisms to promote renewable energy largely rely on the existence of an appropriate legal framework, not only to define the scope and objectives of the intervention, but also to ensure that such laws are implementable and enforceable.[28] Economically, such interventions need to unlock local and international investment in the sector by creating security and certainty. This is the critical role that law should play in the transition to a green economy reliant on renewable energy.

6.1.1. Legal certainty and regulatory reorientation

In South Africa as, previously noted, the institutional framework for the energy industry is still dominated by a state owned enterprise, Eskom, which is vertically integrated and dominates all three aspects of electricity, namely is generation, transmission, and distribution. This reality has meant that, apart from the recent successes registered under the REIPPPP, legal interventions to

---

[27] Department of Public Enterprises 'South African Government's Response to Questions on the Eskom Loan Application to the World Bank' < http://www.dpe.gov.za/newsroom/Pages/South-African-Government%E2%80%99s-Response-to-Questions-on-the-Eskom-loan-application-to-the-World-Bank.aspx >

[28] IC Grobbelaar 'The Privatisation of the Electricity Industry in South Africa' (2011) 845, 852 ('Environmental principles such as polluter pays and the precautionary principle have been important restraints on the harmful effects of economic development. But as environmental law began to grow and develop, *a new dimension emerged of the important role that law and the economy can play together not only by restricting but by using market incentives to actively promote environmental objectives*').

remove the obstacles discussed in Chapter 3 and legal gaps discussed in Chapter 4 and 5 by creating an enabling institutional environment for IPPs have been slow. The success of the REIPPPP programme could have been exponential with more certainty and clear rules. It must be added though, that Eskom also provides valuable planning advise to government which sometimes is not followed with disastrous consequences like the 2008 crisis.[29]

South Africa has attempted to send policy signals indicating its desire to create space for private sector players in the electricity sector.[30] There were attempts to introduce an independent systems operator that will be responsible for regulating the generation and trading in electricity, as it were, with Eskom being just one of the many energy generators in the country. The Independent Systems Operator (ISMO) Bill[31] was abandoned. Similarly, the Constitutional amendment necessary to establish the Regional Electricity Distributors (REDs) met an uncertain fate in the legislature and has not been revived since 2009.[32] The failure to pass these Bills is further evidence of the constitutionally embedded institutional structural problems regarding the distribution of legislative competence on energy especially between national government and local sphere of government.

Despite the above limitations regarding the broad institutional restrictions, South Africa has enacted several laws that are aimed at promoting institutional integration in electricity sector regulation. We have noted the

---

[29] President Mbeki admitted that the crisis is a result of failure by government to invest in generation capacity as advised by Eskom, see F Blandy 'Dark days ahead for energy-strapped SA' *Mail & Guardian* (12 December 2007) <http://mg.co.za/article/2007-12-12-dark-days-ahead-for-energystrapped-sa > (He reportedly said that Eskom asked for investments to expand capacity and 'We said not now, later. We were wrong. Eskom was right. We were wrong').

[30] Section 27 of the ERA spells out the duties of municipalities in electricity reticulation, virtually giving them all the responsibility for reticulation of electricity services.

[31] Independent Systems Operator Bill B9B-2012, the Minister of Energy in late 2014 promised to revise the Bill and reintroduce it to Parliament; see also Sue Blaine 'Eskom no longer 'player, referee and linesman' if new plan is approved' Business *Day* (19 February 2014); L Donnelly 'Bill to Open up Energy Markets Stalls' *Mail & Guardian* (5 July 2013) (the two articles illustrate extensive the public discourse that has been taking place since 2012 on the strength and weaknesses of the proposed independent operator system. Whilst favoured, concerns have been consistently expressed that the ISMO Bill should not be used to privatise and commercialise Eskom). See further Establishing the Independent System and Market Operator, Energy Portfolio Committee Meeting Report, 1 February 2013.

[32] Constitutional Amendment Bill No 17 of 2009 was never introduced into the relevant house and for all intends and purposes abandoned.

creation of NERSA as a single regulator and the introduction of the National Energy Act in 2008 in terms of which a system of integrated energy resource planning.[33] Similarly, the ERA has also been amended to institutionally create a conducive environment for private energy producers.[34] More amendments to the ERA and the National Energy Regulator Act were proposed to ensure that the role played by IPPs is clarified and that the IPPs' rights and obligations become clear as they move into this hitherto monopolised sector.[35] This has further been clarified by the shift from FITs to the REIPPPP under which historical progress has been made. Nevertheless, arguments still persist on the policy dissonance and uncertainty especially in the wake of a nuclear renaissance that threatens the long-term sustainability of renewable energy.[36]

The energy sector legal reforms are aimed at creating an institutional and legal environment that does not hinder the entrance into the electricity sector by renewable energy IPPs. There have been institutional and legal changes yet these have not been sufficient to enable a more determined transition to renewable electricity. The IRP 2 assisted in bringing some certainty in terms of the electricity energy plans for the country to 2030. The IRP 2 is not a fool proof plan, but from a regulatory point of view, it provides investors with some signals to potential investment directions.[37] Concurrently, the enthusiasm with which South Africa has moved to implement the REIPPPP, discussed in 6.2.2 below, also shows its commitment to take action to create a market for IPPs. This process can assist the government to assess the extent to which IPPs can contribute to South Africa's future energy mix. The REIPPPP is therefore more

---

[33] The IRP2 is the plan that currently is providing some guidance for planned as well as certainty to investors to see what the government is thinking about the energy situation to 2030.
[34] Sections 34 and 35(4) of the ERA on New Generation Capacity were introduced in 2004 by Amendment Act 28 of 2007. This section has enabled the Minister to promulgate regulations for IPPs to enter the energy sector.
[35] Electricity Regulation Second Amendment Bill GN 905 in GG 34870 of 19 December 2011 read with National Energy Regulator Amendment Bill GN 890 in GG 34825 of 8 December 2011.
[36] These are mostly implementation challenges emanating from institutional fragmentation and grid related technical bottlenecks.
[37] L Baker, P Newell & J Phillips 'The Political Economy of Energy Transitions: The Case of South Africa' (2014)19 *New Political Economy* 804 (noting that the IRP is not aligned to the LTMS, the New Growth Path or the 2009 Copenhagen voluntary GHG emissions reductions by South Africa); see various critical comments by stakeholders on the IRP 2 at the 'IRP Public Hearing: Johannesburg' 2-3 December 2010 <http://www.energy.gov.za/files/irp_frame.html >

a pilot test, with time the industry can develop roots and enable a smooth transition when the government begins to disinvest in conventional sources. [38] Despite its success, the REIPPPP comes late and slow given the commitments to renewables in the 2004 Renewables White Paper.

6.1.2. Constitutional and institutional responses

Despite state initiatives towards creating an institutional framework that is enabling for renewable energy, [39] there is criticism of the initiatives or the lack of effective bold steps towards dismantling institutional and legal obstacles to renewable energy. Arguments are advanced that institutional fragmentation continues to be an obstacle while Eskom's dominance in policy and decision-making is worrying for IPPs. [40] The virtual abandonment of the ISMO Bill and REDs confirm these criticisms.[41] Eberhard argues that the REIPPPP has proved more enabling relative to FITs,[42] which the government has virtually frozen. Eskom and the government retain a firm grip on the electricity sector and future planning in this sector. Tyler captures explaining that:

> [t]he misalignment between, and confusion and opaqueness surrounding, the electricity planning processes, together with the transfer of the IRP process from NERSA to Eskom and subsequently to the DoE, indicates that while the exercise has to some extent been undertaken on paper, there has not been a

---

[38] Keynote address by the Minister of Energy of South Africa, Ms Dipuo Peters, MP, Africa Energy Indaba, Sandton, 19 February 2013, 8 'We have to however consistently remind successful [REIPPPP] bidders that we have put in place the necessary monitoring and tracking systems to ensure that the commitments in relation to community upliftment and localization are achieved.'

[39] L McDaid 'Renewable Energy Independent Power Producer Procurement Programme Review 2014' Electricity Governance Initiative South Africa (2014) 3 *Electricity Governance Initiative South Africa - REIPPPP Review* 47 (recommendations to address identified weakness of the REIPPPP).

[40] Baker, Newell & Phillips (note 37 above) 799; B Msimanga & AB Sebitosi 'South Africa's Non-Policy Driven Options for Renewable Energy Development' (2014) 69 *Renewable Energy* 420, 422; A Pegels 'Renewable Energy in South Africa: Potentials, Barriers and Options for Support' (2010) 38 *Energy Policy* 4945, 4952.

[41] Recently the Minister of Energy promised to relook at the ISMO Bill and bring it back to Parliament as part of the solutions to address the electricity crises, which the President chose to call a 'challenge' in his 2015 State of the Nation Address.

[42] A Eberhard 'Feed-in Tariffs or Auctions? Procuring Renewable Energy Supply in South Africa' (2013) 388 *Viewpoint. Public Policy for the Private Sector* 36,37; A Eberhard, J Koeller & J Laigland 'South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons' (2014) 30-33.

> consistent institutional planning leadership or delivery. A national process of energy planning and coordination has not been embedded, thus enabling Eskom and its interests to dominate.[43]

This resonates with the argument in Chapter 2 and may require constitutional review of the competences on energy and the current institutional arrangement for regulation of energy, including the role of municipalities as distributors and Eskom's monopoly.

The Constitutional framework for governance of the energy sector remains a limitation, which the above institutional responses have not directly addressed. At the national level, many departments are relevant ranging from Public Enterprises, National Treasury, Environmental Affairs, and Energy. The role of national, provincial, and municipal spheres of governments in energy sector regulation is still a source of friction. While some provinces have moved ahead with their own renewable energy initiatives,[44] the competent authority remains the national government whose focus remains largely on cheap energy sources to drive its developmental agenda and grow the economy and jobs. For the innovative provinces, the institutional design in the Constitution is disempowering as the centralised institutional set-up can delay their initiatives. Thus an investor or an IPP may be led to believe that there is space to thrive in the Western Cape but be faced with insurmountable hurdles at the national level to get procurement approvals required to despatch electricity to provinces.

The ineffectiveness of the cooperative governance principles and system is a key indicator that the institutional environment for energy governance

---

[43] E Tyler 'Aligning South African Energy and Climate Change Mitigation Policy' (2010) 10 *Climate Policy* 575, 582; see also B Becker & D Fischer 'Promoting Renewable Electricity Generation in Emerging Economies' (2013) 56 *Energy Policy* 446, 452.

[44] G Prasad & E Visagie 'Renewable Energy Technologies for Poverty Alleviation Initial Assessment Report: South Africa' *Renewable Energy Technology (RET) Working Group* (2005) 9. (some provinces developed their own local renewable energy strategies, programmes and projects); C Rogerson 'Ekurhuleni: Towards a Local Industrial Policy for Driving Pro-Poor Growth and a People-Centred Economy' *Case Study prepared for the World Bank-Netherlands Partnership Program Evaluating and Disseminating Experiences in Local Economic Development Investigation of Pro-Poor LED in South Africa* (2005); Draft White Paper on Sustainable Energy for the Western Cape Province, Department of Environmental Affairs and Development Planning, 2010 and the relevant EIA studies reports at < http://www.eskom.co.za/OurCompany/SustainableDevelopment/EnvironmentalImpactAssessments/Pages/Wind_Energy_Facility_In_The_Western_Cape.aspx >

remains problematic. Unlike the 'environment', 'energy' is clearly an area of national legislative competence, yet as this study has proved, energy is an integral part of natural resources or environmental governance. The separation of competences for 'energy' and 'environment' as well as 'electricity' per se gives rise to problems. These can be illustrated with the challenges faced in environmental governance in 2010. The outright confusion[45] between the national mining department and environment department, joined by provincial and municipal departments is symptomatic of challenges that could arise in the implementation of big renewable energy projects. Such problems arise when a private entity seeks land use permits and environmental authorisations and the domineering role that national departments.[46]

The *Maccsand* dilemma permeates all natural resources governance arrangements in South Africa.[47] While the Constitutional Court insisted that mere co-regulation of an activity does not necessarily result in regulatory conflict, clearly the executive thinks otherwise, which is why they ended up before the court anyway. It remains to be seen whether *Maccsand* is going to change the mind-set of the executive. The fact that energy, like mining is an area of exclusive national competence could mean that institutionally provinces and municipalities are constrained in local level initiatives that they could take to promote renewable electricity.[48] This presents a challenge in that small and

[45] Leading to the *Maccsand* line of cases in which the government department were litigating against each other.
[46] Land access and environmental requirements have been cited as part of the administrative hurdles for IPPs – see Gets (note 6 above) 721.
[47] For the implications of the *Maccsand* judgment see detailed discussions in, T Humby 'Maccsand in the Constitutional Court: Dodging the NEMA Issue [Discussion of *Maccsand (Pty) Ltd v City of Cape Town* (2012) 4 SA 181 (CC)]' (2013)24 *Stellenbosch LR* 55-72; T Humby '*Maccsand:* Intergovernmental Relations and the Doctrine of Usurpation' (2012)27 *SA Public Law* 628-638; T Humby 'Revisiting Mining and Municipal Planning: *Mtunzini Conservancy v Tronox Kzn Sands Ltd*: Case Note' (2013)29 *SAJHR* 651-665.
[48] Schedule 4 and 5 of the Constitution, mandating that electricity and gas reticulation are exclusive areas of local government competence.

distributed energy projects are potentially a big solution to the technological limitations of grid-based electricity.[49]

Similarly, the Constitutional Court's judgment in *Joseph*[50] has certain institutional implications for provincial and municipal spheres of government in terms of what they can or cannot do to control electricity usage. The virtual creation of a right to electricity in urban areas means that municipalities[51] are under obligations to ensure that every resident has access to basic electricity. This is consistent with the Basic Electricity Policy[52] and addressing energy poverty,[53] yet the challenge is to ensure that the source of this electricity is not conventional fossils. On the contrary meeting these primary obligations from renewable sources could be economically unsustainable for municipalities given the cost and their ability to levy and collect rates from some of the consumers who are unable to pay.

The electrification programme has in fact added to the huge demand, which nearly brought the grid down in 2008-2009, as there was no relative increase in the supply capacity to meet the increased demand from access promotion programmes. The programme represents a missed opportunity to use renewable electricity energy especially in remote and rural areas where

---

[49] The municipalities or provinces concerned must ideally regulate small hydro, solar, biogas, and biomass generators to relief the national regulatory agencies of too many small jobs. This view resonates with what the eThekwini and Western Cape are doing and potential constitutional issues. eThekwini has in fact established an Energy Unit within its Treasury despite energy being a national competence.

[50] *Joseph & others v City of Johannesburg & others* 2010 (4) SA 55 (CC) held that while there is no explicit right of access to electricity, provision of this service is an integral part of the obligations of a municipality is providing services including housing.

[51] See s 27 of the ERA for municipalities' obligations. However, the courts have also indicated that municipalities have the power to discontinue the provisions of such services if there is non-payment, see *Body Corporate Croftdene Mall v Ethekwini Municipality* 2012(4) SA 169 (SCA) applying s 102 of the Local Government: Municipal Systems Act.

[52] Department of Minerals and Energy, Electricity Basic Support Services Tariff (Free Basic Electricity) Policy, Pretoria (2003), explained further through the through *Guidelines for Free Basic Electricity* (2003). The government also developed the Free Basic Alternative Energy Policy (Households Energy Support programme) to support other sources of energy (bio-ethanol, liquid fuels (LPG), and coal) apart from electricity.

[53] Keynote address by the Minister of Energy of South Africa, Ms Dipuo Peters, MP, Africa Energy Indaba, Sandton, 19 February 2013, 3 and 5; See also general G Ruiters 'Free Basic Electricity in South Africa: A Strategy for Helping or Containing the Poor' in D McDonald *Electric Capitalism: Recolonising Africa on the Power Grid* (2012) 248, 256 (Mbeki decried that benefits of free electricity not benefiting the poor).

small hydro and solar and wind energy are optimum. As the Minister of Energy has repeatedly said:

> [t]he use of clean energy sources contributes immensely towards reducing poverty, mitigating climate change and the improvement of African people's health. Poor households could flee the poverty trap by reducing their expenditure on fuel. We should assist them in replacing fuel-inefficient and polluting stoves with those with better or lesser energy-combustion properties. We should consider innovative ideas such making available proven technologies to schools for micro biogas initiatives that could fuel school feeding schemes. Schools, clinics, and other public facilities can generate their own power through solar and wind applications suitable to their size.[54]

Legal reforms in the form of review and amendment of the ERA, the National Energy Regulator Act and the enactment of the National Energy Act have not done enough to remove the legal and institutional obstacles to IPPs. The IRP 2 made in terms of the ERA and the National Energy Act has received a lukewarm response given how it almost puts renewable in the periphery of South Africa's future energy mix.[55]

The energy regulatory framework must be reformed for it to provide a clear strategy enabling a transition to renewable energy.[56] Reforms in other sector especially the development and implementation of economic instruments can complement this weak legal framework and provide a respite for private sector investors. There seems to be consensus that since most of the major challenges for renewable energy are economic or cost-related and competition related,[57] the solution lies in innovation in market instruments to regulate access, pricing, and infrastructure.[58]

---

[54] Keynote address by the Minister of Energy of South Africa, Ms Dipuo Peters, MP, Africa Energy Indaba, Sandton, 19 February 2013, 5-6.
[55] Ibid, 11 ('The determination relates to base load generation capacity and includes:
2 500 MW of coal fire generation for introduction into the system by 2024, 2 652 MW of gas power by 2025, 2 609 MW of imported hydropower and 465 MW of other technology.'); S 34 ERA, New Generation Capacity Regulations.
[56] Tyler (note 43 above) 584 (noting the success of REIPPPP is in a on text of 'untested and incomplete regulatory environment' thus with no guarantee of programme sustainability).
[57] J Foster-Pedley & H Hertzog 'Financing Strategies for Growth in the Renewable Energy Industry in South Africa' (2006) 17 *JESA* 57, 61.
[58] These market instruments can be introduced through legal regulation as opposed to allowing the market to self-regulate whilst it still dominated by conventional fossil sources.

6.1.3. Integrated energy resources planning

Integrated energy resources planning, is a very useful tool in enabling countries to forecast and plan how to deploy resources to provide reliable, affordable and secure energy. This approach has been included as an embedded energy planning approach in South African energy law. Quite a number of the barriers to renewable energy are a result of poor planning or the inefficient implementation of good plans.[59] Thus as a way to address such barriers the country has made use of integrated resource planning to enable the integration of renewable energy sources into the energy mix. Integrated planning is provided for in s 6 of the National Energy Act[60] and s 35 of the ERA. These legislative provisions in energy laws must be read together with planning provisions in environmental and planning legislation that also affect implementation of energy projects.

These include biodiversity plans, environmental management and implementation plans, development frameworks infrastructure and spatial development plans. Integrated planning generally and as applied in energy law can assist remove fragmentation and misalignment of plans across government department and spheres of government. This thereby enables IPPs to effortlessly integrate renewable energy into the grid. D'Sa defines integrated resource planning in the power sector as 'an approach through which the estimated requirement for electricity services during the planning period is met with a least-cost combination of supply and end-use efficiency measures, while

[59] C Yelland 'Analysis: Electricity Problems Converge as Eskom CEO Departs' *Daily Mavericks* (2 April 2014) <http://www.dailymaverick.co.za/article/2014-04-01-analysis-electricity-problems-converge-as-eskom-ceo-departs/#.VOZmuXbj_LU >

[60] Section 6 (1) and (2) National Energy Act 'The Minister must develop and, on an annual basis, review and publish the Integrated Energy Plan…The Integrated Energy Plan must deal with issues relating to the supply, transformation, transport, storage of and demand for energy in a way that accounts for – (*a*) security of supply; (*b*) economically available energy resources; (*c*) affordability; (*d*) universal accessibility and free basic electricity; (*e*) social equity; (*f*) employment; (*g*) the environment; (*h*) international commitments; (*i*) consumer protection; and (*j*) contribution of energy supply to socio-economic development.'

incorporating concerns such as equity, environmental protection, reliability and other country-specific goals.'[61]

Integrated planning for energy resources can also contribute to the development of clear policy position on renewable energy. With the first and second integrated resource plans (IRP), South African energy policy has become clearer, even if uncertain, in terms of what the country is planning for the future particularly the role of renewable sources of energy.[62]

Integrated energy plans provide a window to see the total energy demand/needs of the country, what sources of energy are available, and how they are to be promoted, in what proportions, and for how long. This information is useful for private sector investors and the renewable energy sector. The Draft Integrated Energy Plan (Draft IEP) 2013[63] builds upon the IRP 2 of 2010 showing progressive coordination of energy planning in South Africa.

However, integrated energy planning is still removed from other planning that has potential implications for energy development. Therefore, one would have expected a better alignment of the Draft IEP (2013), and the proposed Carbon Tax Policy 2013 to Climate Change White Paper (2011) and the Renewables White Paper (2003). Similarly, these draft and finalised policy documents further need to be synchronised with develop plans like the National Development Plan (NDP),[64] the New Growth Path, and the Minerals

---

[61] A D'Sa 'Integrated Resource Planning (IRP) and Power Sector Reform in Developing Countries' (2005) 33 *Energy Policy* 1271,1272. The energy statutes do not substantively define the term at all.

[62] Baker, Newell & Phillips (note 37 above) 802.

[63] Department of Energy, Draft 2012 Integrated Energy Planning Report, GN 513 in GG 36690 of 24 July 2013.

[64] The National Development Plan was developed in the context of, and aligned to the New Growth Path Framework, hence the National Development Plan, 117 states that 'With regard to current government policies and programmes, the New Growth Path is the government's key programme to take the country onto a higher growth trajectory. The New Growth Path is about creating the conditions for faster growth and employment through government investment, microeconomic reforms that lower the costs of business (and for poor households), competitive and equitable wage structures, and the effective unblocking of constraints to investment in specific sectors. The proposals in this chapter are largely consistent with these policies. They do, however, cover a longer time frame and the emphasis on catalysts and action steps may differ in some respects.'

Beneficiation Strategy.[65] While this study focuses on the electricity sector of the energy industry, these development and natural resources management plans present cross cutting challenges and opportunities for mainstreaming renewable energy. Peripheral policies being developed will therefore not be pursued here, being mentioned only to illustrate policy incoherence.

The connection between electricity supply and economic growth inevitably means that the promises of the New Growth Path and the NDP on employment, economic growth and greening the economy calls for even better cross-sectoral coordination and integration of policy development and planning. This applies with full force to the development objectives set out in the NDP, whose achievement could be impacted by how the Carbon Tax, REIPPPP, and Climate Change targets and strategies are implemented. This makes the National Planning Commission, the National Nuclear Energy Executive Coordination Committee, Environmental Affairs, Energy, Public Enterprises, and National Treasury critical departments. This requires effective cooperative governance across these departments and agencies. The proposed tax on energy fuel inputs under the Carbon Tax Policy directly affects the feasibility and potential to deliver on the economic targets in the New Growth Path and the NDP. An exhaustive discussion of the carbon tax is beyond the aims of this study.

The intertwinement of development planning and energy planning requires that this current policy fermentation in South Africa be adequately aligned and coordinated. It can be argued that the IRP 2, blueprint for energy resource planning has been a partially successful response to the poor energy resource planning that plunged South Africa into the electricity crisis of 2008. It is through the IRP 2 that the REIPPPP was possible and some certainty brought into the plans for renewable energy especially from IPPs.

---

[65] Beneficiation Strategy for Minerals industry in South Africa (2011) <http://www.gov.za/documents/beneficiation-strategy-minerals-industry-south-africa> (proposal to give the government more control over energy mineral resources in terms of export and local security of supply given South Africa' heavy reliance on coal).

6.2. Towards an energy market and economic incentives

A more challenging obstacle comes from the economic arguments against renewable electricity sources. These economic barriers discussed in Chapter 3 focused on cost, competitiveness, and commercial viability/feasibility of renewable energy.[66] Different tools have been tried worldwide to try to level the economic playing field between conventional non-renewable and renewable sources of electricity.[67] These have ranged from direct public investment into the sources through subsidisation of upfront costs, funding of research and development, setting of renewable quotas, portfolio standards, disinvestment in conventional sources by government, setting a price on carbon/carbon tax and trading schemes. These tools have met with different levels of success primarily determined by the social, economic and policy context of each country.[68] South Africa is only now taking specific direct steps to promote renewable energy.[69] The interventions that the government is taking are varied and transcend the energy, environmental and development sectors. What is relevant for the purposes of this study are market-based instruments in the electricity sector that level the playing field and stimulate private sector entry into the energy sector .

---

[66] see Chapter 5 (5.1) above,

Economic obstacles to renewable electricity 212.

[67] For detailed and technical comparative studies evaluating the various mechanisms to promote renewable energies see, Butler & Neuhoff (note 13 above) 1854-1867; M Mendonça, D Jacobs & BK Sovacool *Powering the Green Economy: The Feed-in Tariff Handbook* (2009); C Hiroux & M Saguan 'Large-Scale Wind Power in European Electricity Markets: Time for Revisiting Support Schemes and Market Designs?' (2010) 38 *Energy Policy* 3135-3145; E Martinot *et al* 'Renewable Energy Markets in Developing Countries' (2002)27 *Annual Review of Energy and the Environment* 309-348; P Menanteau, D Finon & ML Lamy 'Prices versus Quantities: Choosing Policies for Promoting the Development of Renewable Energy' (2003)31 *Energy Policy* 799-812 (comparing the effectiveness of various instruments used in the EU to promote renewable energy.); M Ringel 'Fostering the Use of Renewable Energies in the European Union: The Race between Feed-in Tariffs and Green Certificates' (2006)31 *Renewable Energy* 1-17 (evaluating green certificates and fee-in-tariffs in the EU).

[68] W Xi, M Runlin & M Dong 'Strategy, Policy, and Law Promoting Renewable Energy Resources in China' in AJ Bradbrook & RL Ottinger *The Law of Energy for Sustainable Development* (2005) 302; BK Sovacool 'A Comparative Analysis of Renewable Electricity Support Mechanisms for Southeast Asia' (2010) 35 *Energy* 1779-1793; G. Buckman & M Diesendorf 'Design Limitations in Australian Renewable Electricity Policies' (2010)38 *Energy Policy* 3365-3376.

[69] H Winkler 'Energy Policies for Sustainable Development in South Africa' (2007) 11 *Energy for Sustainable Development* 26-34; Eberhard (note 42 above).

A particularly direct economic instrument was the development of renewable electricity FITs that was to enable IPPs to break into the generation sector. Developed in 2009 the FITs policy documents details the rationale for the policy, and implementation measures including the subsequent promulgation of the actual tariffs for the preferred forms of renewable electricity namely wind, solar, and CSP.[70] The tariffs were gazetted in 2010, but before their implementation, the government had a change of mind based on the legal complexities[71] around the development and implementation of the FITs. As previously stated in Chapter 4, some argued that as currently configured NERSA had no power to prescribe specific tariffs for renewable energy and that it had exceeded its regulatory mandate. This is one of the reasons why the ERA is under review with the aim being to enable NERSA to effectively regulate electricity pricing and set renewable energy FITs.[72] Instead of waiting for legislative changes the government proceeded to develop the renewable energy procurement programme, which circumvented the legal and institutional challenges encountered with the FITs. As noted above, the REIPPPP has been relatively successful in terms of identifying potential IPPs awarding them contracts for the generation of renewable electricity. What remains unevaluated is the actual implementation of the various projects that won the bids under the various phases (bid windows) of the procurement programme.[73]

FITs have been credited with the success of the Germany, and Danish wind energy sectors and it is widely believed that it is the best way to

---

[70] NERSA, Renewable Energy Feed-In Tariff (REFIT) Guidelines (March 2009).

[71] R Samba 'To REFIT or not to REFIT' (2009) *Hub Digest* (noting that the FITs fell afoul of s 217(1) of the Constitution 'fair, equitable, transparent, competitive and cost effective' procurement. NERSA reportedly also secured counsel's opinion to this effect).

[72] Electricity Regulation Second Amendment Bill GN 905 in GG 34870 of 19 December 2011 read with National Energy Regulator Amendment Bill GN 180 in GG 34825 of 8 December 2011.

[73] The REIPPPP programme itself has received substantial attention from policy analysts (*not legal* analysts) for which see further: DR Walwyn & AC Brent 'Renewable Energy Gathers Steam in South Africa' (2015) 41 *Renewable and Sustainable Energy Reviews* 390-401; Baker & Wlokas, 'South Africa's Renewable Energy Procurement: A New Frontier' *Tyndall Centre for Climate Change Research* (2014); D de Jongh, D Ghoorah & A Makina 'South African Renewable Energy Investment Barriers: An Investor Perspective' (2014)25 *JESA* 15-27; Eberhard, Koeller & Laigland (note 42 above).

economically provide incentives for renewable electricity.[74] Often this argument is projected as universal, yet studies on FITs show that despite being behind the success of the European leaders in renewable energy, they have their own flaws as a response mechanism to barriers against renewable energy.[75] Mendonca argues that FITs can be limited in impact if they are not properly designed and implemented.[76] In other words, other factors explain the success by leading European countries in renewable energy, which are not replicable in developing countries.[77] These factors include, but are not limited to, the socio-economic environment, user awareness, and energy efficiency campaigns that assist in ameliorating the technological shortcomings of some renewable energy sources. An optimum mix of regulatory instruments enabled Germany to effectively use FITs under its *Energiewende* programme[78] to promote renewable energy and effectively retire most of its nuclear fleet from 2010 to 2022. Even then, it has been noted[79] that FITs under the *Energiewende* depend on consumer willingness to pay, which has seen opposition, by domestic consumers. This is big contextual difference as most domestic consumers in South Africa depend on some level of subsidisation by government including free supply of basic electricity for poor households.

Under the *Energiewende*, Germany set the example in terms of renewable energy policies and laws can increase the use of renewable energy.

---

[74] See sources in note 7 above.

[75] Becker & Fischer (note 43 above) 447; M Venables 'Fit for Purpose? Feed in Tariffs Come under Scrutiny' (2011) 6 *Engineering & Technology* 18-19; Davies & Allen (note 14 above); A Pegels 'Pitfalls of Policy Implementation: The Case of the South African Feed-in Tariff' in JA Haselip *et al Diffusion of Renewable Energy Technologies: Case Studies of Enabling Frameworks in Developing Countries* (2011) 101.

[76] Mendonca, Jacobs & Sovacool (note 67 above) 57-64 lists the following as indicators of poorly designed feed-in tariff schemes: low tariff level, unnecessarily high tariff level, flat-rate tariff, using maximum and minimum tariffs (Kenya e.g.), providing exemptions from purchase obligations (Kenyan model), and bad financing mechanisms to support the tariff scheme as well as bad tariff calculation methodologies, capacity caps (stifle market growth and may lead to market crushes/collapse once cap is reached); and lastly the legal status of the tariff scheme (unless legally binding it may be ineffective.)

[77] J Haselip 'Fit for Use Everywhere? Assessing Experiences with Renewable Energy Feed-in Tariffs' in Haselip *et al* (note 75 above) 89, 94.

[78] M Bechberger & D Reiche 'Renewable Energy Policy in Germany: Pioneering and Exemplary Regulations' (2004) 8 *Energy for Sustainable Development* 55 and 56 (phasing out of nuclear in Germany was in fact an incentive for renewable energy through demand stimulation).

[79] R Beveridge & K Kern 'The *Energiewende* in Germany: Background, Developments and Future Challenges.' (2013)4 *Renewable Energy L. & Policy Rev.* 3, 12-13.

It is reported that more than 350,000 were created and Germany reduced its dependence on fossil fuels and nuclear. The programme consisted of multiple concurrent, interventions ranging from economic incentives through both feed in tariffs and auctions, co-generation, environmental taxes and carbon emission trading systems, as well as climate response regulations aided by other EU-wide interventions.[80] The programme was also heavily supported by effective energy conservation and energy efficiency campaigns and measures, which enable renewable sources to take root in the energy market.

The multipronged approach by Germany and its exemplary results contrasts sharply with the piecemeal and contradictory approach by South Africa. Whereas Germany is determined to abandon fossil fuels and phase out nuclear, South Africa is ramping up both coal and nuclear at the same time as it purports to implement a renewable energy programme. Similarly, support for demand-side management interventions is erratic and ineffective, while there is a singular focus on the auction system. FITs have been frozen and there is no carbon emissions trading, no electricity related carbon taxes to support the transition. It crucial to note that Germany enacted a specific Electricity Feed-in Law of 1991; and then the Renewable Energy Sources Act (EEG 2000, as revised in 2014 to shift from FITs to an auction system) to ensure the implementation of renewable support measures.

South Africa attempted to introduce FITs, but they were never used in practice to procure renewable energy as it was soon discovered that the use of FITs was potentially breached constitutionally procurement and competition provisions.[81] The country immediately shifted to the bidding process or the auction based system where IPPs bid to provide electricity from specified sources at competitive prices. The renewable energy procurement programme

---

[80] A detailed comparative analysis of the Germany experience is reserved for further research as it is a large endeavour on its own. Further details on the *Energiewende* is available at: < http://energytransition.de >, a recent analysis that would be of interest is M Lang & A Lang 'The 2014 German renewable energy sources act revision: From feed-in tariffs to direct marketing to competitive bidding.' (2015) 33:2 *Journal of Energy & Natural Resources Law* 131-146 and Beveridge & Kern *ibid.*

[81] Becker & Fischer (note 43 above) 452 (Eskom withheld its support, while National Treasury felt the process was beyond NERSA's powers). Section 217(1) of the Constitution requires 'fair, equitable, transparent, competitive and cost effective' procurement.

is discussed in detail below but it is incomparable to the Germany *Energiewende,* especially in a context where the other support mechanisms (e.g. energy efficiency, energy conservation) instrumental for the success of the *Energiewende* have largely received less than serious attention in South Africa

6.2.1. Subsidies and direct state funding in the energy market

A regulatory intervention frequently put forward as one that could enable the development of renewable electricity sources is the scrapping or reduction of subsidies for fossil fuels[82] and creation of incentives for renewable sources. It is argued that subsidisation of fossil fuels makes the market playing field uneven as unsubsidised and already expensive renewables cannot compete with conventional sources.[83] Several studies have disclosed huge amounts of subsidies going towards fossil power generation in one form or another.[84] The subsidisation of conventional sources is pervasive in both developed and often liberalised energy markets, and even high in centralised monopolies of the developing countries. A simplistic approach to the removal or reduction of electricity subsidies could have widespread effects on the social, economic and

[82] In South Africa the indirect subsidization of electricity, through government support for Eskom by supporting low electricity prices has essentially been reduced by allowing NERSA to approve realistic prices, although the price of electricity still needs to increase to cover generating costs. The *World Energy Outlook 2014* calculate global fossil (inclusive of liquid fuels and electricity) subsidy to be at $550 billion, that is 'over four-times those to renewables.' < http://www.worldenergyoutlook.org/publications/weo-2014/ >; see also TS Alleyne & M Hussain *Energy Subsidy Reform in Sub-Saharan Africa: Experiences and Lessons* (International Monetary Fund, 2013) 8 and 15 (empirical study of energy subsidies and their impact in Sub-Saharan Africa).

[83] J Goldemberg 'The Promise of Clean Energy' (2006) 34 *Energy Policy* 2185, 2188; Alleyne & Hussain, *Energy Subsidy Reform in Sub-Saharan Africa: Experiences and Lessons*.

[84] International Energy Agency (IEA) 'Renewable Energy: Policy Considerations for Deploying Renewables' OECD/IEA (2011) 57 ('In many countries, subsidies for fossil fuels distort the market and undermine the cost competitiveness of RETs. Existing fossil fuel subsidies, therefore, need to be redirected in favour of support for renewables and energy efficiency.'); B Larsen, *World Fossil Fuel Subsidies and Global Carbon Emissions* (World Bank Publications, 1992); F Birol 'World Energy Outlook 2010' *International Energy Agency* (2010); C Riedy & M Diesendorf 'Financial Subsidies to the Australian Fossil Fuel Industry' (2003) 31 *Energy Policy* 125-137.

institutional stability of energy systems especially in developing countries[85] – largely positive economic and environmental effects and adverse social impacts.[86] Thus, some argue that subsidies must be approached with a holistic view that takes into account the reasons why the energy costs are subsidised by the state.[87] Furthermore, an argument is made that blind subsidisation of renewables will not necessarily make them the energy source of choice especially given the social and institutional dimensions of energy choices that are often ignored by studies that focus on economic regulation as the main area of intervention to promote renewables.[88]

Despite the argument for and against subsidies, it is arguable that subsidies for conventional sources of electricity influence the competitive advantage of the sources of electricity and they create distorted impressions of the viability and cost effectiveness of renewable electricity. The consumers of electricity are often ignorant of how the price is determined and often they assume that electricity from conventional sources of electricity is cheaper than renewables and thence believe the often-unfounded arguments advanced against renewable electricity sources.[89] Regardless of this lack of awareness, consumer choice for electricity is currently not feasible in South Africa given the

---

[85] E Hope & B Singh 'Energy Price Increases in Developing Countries: Case Studies of Colombia, Ghana, Indonesia, Malaysia, Turkey, and Zimbabwe' *World Bank Policy Research Working Paper* No 1442 (1995).

[86] For detailed literature review and empirical surveys see further J Ellis 'The Effects of Fossil-Fuel Subsidy Reform: A Review of Modelling and Empirical Studies' *Available at SSRN 1572397* (2010). <http://ssrn.com/abstract=1572397 > 32-33; Global Subsidies Initiative (GSI) of the International Institute for Sustainable Development (IISD) Geneva, Switzerland

[87] A Ochs, E Anderson & R Rogers 'Fossil Fuel and Renewable Energy Subsidies on the Rise' in *Vital Signs* (Springer, 2013).

[88] A Ciarreta, MP Espinosa & C Pizarro-Irizar 'Is Green Energy Expensive? Empirical Evidence from the Spanish Electricity Market. (2014)69 *Energy Policy* 205, 214 (highlighting from an empirical study that in Spain FITs became clearly unsustainable after a certain point leading to reforms in 2013); T Laan & C Beaton 'Strategies for Reforming Fossil-Fuel Subsidies: Practical Lessons from Ghana, France and Senegal' (April 26, 2010). Available at SSRN: <http://ssrn.com/abstract=1596033>

[89] RL Bradley 'Renewable Energy: Not Cheap, Not Green?' (1998) 17 *Strategic Planning for Energy and the Environment* 15-21; T Trainer *Renewable Energy Cannot Sustain a Consumer Society*, Vol. 33 (Springer, 2007); N Cass & G Walker 'Emotion and Rationality: The Characterisation and Evaluation of Opposition to Renewable Energy Projects' (2009) 2 *Emotion, Space and Society* 62-69; D van der Horst 'Nimby or Not? Exploring the Relevance of Location and the Politics of Voiced Opinions in Renewable Energy Siting Controversies' (2007) 35 *Energy Policy* 2705-2714; P Devine-Wright 'Reconsidering Public Attitudes and Public Acceptance of Renewable Energy Technologies: A Critical Review' *Manchester: School of Environment and Development, University of Manchester.*

market and system domination by Eskom. It is the single buyer and will be for the near future for both renewable and fossil generated electricity. Even the power produced by IPPs that are now online is despatched on the same terms as Eskom's own fossil generated power.

The research on subsidies indicates that provision of 'smart' subsidies for renewables could assist renewable electricity off-take, as long as the subsidies are self-eliminating or not permanent.[90] Pointedly, on the Spanish system Ciarreta and others concluded that the:

> system of incentives was not sustainable and this led to significant changes in energy policy in 2013, when the system of feed-in tariffs and premiums was cancelled. In an attempt to tackle the tariff deficit in Spain, the aim of the new regulation is to cover producers' costs and attain reasonable profitability. However, the lack of incentives and the changing legal framework will soon become apparent with new renewable energy installed capacity coming to a standstill.[91]

Thus, subsidies in any form will not, per se, make renewables sources cheaper or the preferred sources of electricity. A multi-pronged approach is required to directly influence energy choices by generators and consumers as was done in Germany. This process of influencing energy choice behaviour is complex and beyond a legal analysis venturing into behavioural economics and sociological studies, for which consult references in the footnotes.[92]

Economic barriers are not necessarily the main reasons why renewable sources of electricity cannot effectively compete with conventional sources.[93] This thesis has shown that the entrenchment of conventional sources has permeated the regulatory environment, institutional set up, and the energy system as a whole. The discourse on green economy, renewable energy and

---

[90] Martinot *et al* (note 67 above) 331; KL Shum & C Watanabe 'Network Externality Perspective of Feed-in-Tariffs (FIT) Instruments: Some Observations and Suggestions' (2010)38 *Energy Policy* 3266.
[91] Ciarretta (note 88 above) 214.
[92] For further analysis see, D Gadenne *et al* 'The Influence of Consumers' Environmental Beliefs and Attitudes on Energy Saving (2011) 39 *Energy Policy* 7684,7687; Haselip (note 75 above) 398 *et seq*; S Reddy & JP Painuly 'Diffusion of Renewable Energy Technologies-Barriers and Stakeholders' Perspectives' (2004) 29 *Renewable Energy* 1431; J Stephenson et al 'Energy Cultures: A Framework for Understanding Energy Behaviours' (2010) 38 *Energy Policy* 6120, 6121; Painuly (note 21 above) 80 and 84.
[93] Ibid, Stephenson.

the low carbon economy is dominated by interested parties in the established energy industry who have little hope in renewables and who, despite any such interest, have so become accustomed to conventional sources as the most reliable and secure source of electricity. The dominant energy interest groups shape the regulatory and institutional environment and the discourse on reform of such a system.[94] It is submitted that energy systems are among the most complex systems that are difficult to reform given the balancing act required and the various conflicting interests.

The South African government has provided huge amounts of capital investment support to Eskom for its build programme[95] for the construction of new coal fired power plants and the on-going maintenance of exist capacity. In addition to direct support, Eskom also benefits from indirect fiscal support through mechanism like government guaranteed loans to fund new generation capacity projects,[96] government donating or deferring its dividends in exchange for low electricity prices.[97] These less visible measures constitute subsidisation of conventional sources of electricity and often the consumers are not aware why electricity remains relatively cheap in South Africa. In contrast, the government has not provided any substantial direct subsidy for renewable energy.[98] This is a serious problem that leads to market distortions which many scholars rely on to argue that renewables cannot compete with conventional sources of energy.[99]

As noted in Chapter 3, there is no full cost accounting to internalise the externalised costs of generating electricity from fossil fuels, which is not the

---

[94] JP Tomain, *Ending Dirty Energy Policy: Prelude to Climate Change* (2011) 239.

[95] In the recent State of the Nation Address, President Zuma stated that the government is injecting R23 billion, Agency Staff 'Energy a 'challenge', not a crisis, says Zuma' *BusinessDay* (13 February 2015).

[96] The World Bank, under the Country Partnership Strategy (CPS), is providing South Africa with a $6 billion funding window, of which $3.75 billion is being used for the current Eskom application.

[97] P de Wet 'Eskom Power Price Hikes Deferred, rather than Denied' *Mail & Guardian* (9 March 2012).

[98] The only state subsidies for renewable energy were provided by the Department of Energy's renewable energy subsidy office (REFSO). Tyler (note 43 above) 583 notes that by 2009 it supported only 24MW from 6 projects valued at R15 million; The World Energy Outlook 2014 reported vast discrepancy between subsidy support for fossil fuels compared to renewables globally.

[99] Gratwick & Eberhard (note 119 above) 246.

case with renewables, which are not subsidised. There are no effective legal interventions to reduce fossil subsidies to enable energy prices to reflect the true cost and thus show the relative advantages of renewables.[100] A legal response is required possibly in the form of subsidisation of renewables or tax incentives, which are believed to be good solutions to economic barriers.[101]

Some argue that even with full cost internalisation, some forms of renewable energy may still be more expensive compared to conventionally produced electricity.[102] Nevertheless, studies to the contrary show that the cost of renewable energy could be the same or lower in the medium to long-term if market and pricing distortions are removed.[103] For instance, full internalised pricing of nuclear electricity can result in the price of nuclear power being unaffordable to consumers, but governments fund and subsidise nuclear energy projects and charge unrealistic below cost rates for electricity so produced.[104]

The World Bank,[105] International Energy Agency (IEA) and many international organisations[106] have unanimously stated that subsidisation of conventional energy sources is bad for sustainable renewable energy. In addition, subsidies for fossil fuels affect the effectiveness of energy efficiency and conservation programmes as consumers often do not feel the real cost of

---

[100] M Bazilian & I Onyeji 'Fossil Fuel Subsidy Removal and Inadequate Public Power Supply: Implications for Businesses' (2012) 45 *Energy Policy* 1, 4 (removal of fossil electricity subsidies may have economic and business impacts initially.); Eberhard *et al* 'Underpowered: The State of the Power Sector in Sub-Saharan Africa' *Background Paper 6, World Bank* (2008) 13 (noting that empirical evidence suggested that energy subsidies in the whole Sub-Saharan Africa did not in fact benefit the target poor populations who do not have access to energy, hence removing them is immaterial.)

[101] International Energy Agency (IEA), 'Renewable Energy: Policy Considerations for Deploying Renewables' OECD/IEA (2011) 34 and 36.

[102] AD Owen 'Renewable Energy: Externality Costs as Market Barriers' (2006) 34 *Energy Policy* 632, 642.

[103] Ibid 642. In the third bidding window under the REIPPPP in South Africa, solar and wind were bid at prices lower than the expected price of electricity from under construction Medupi and Kusile coal power stations; see O Hohmeyer 'Renewables and the Full Costs of Energy' (1992) 20 *Energy Policy* 365, 371 (empirical report showing similar impact in Germany in relation to wind and solar photovoltaic energy).

[104] N Apergis *et al* 'On the Causal Dynamics between Emissions, Nuclear Energy, Renewable Energy, and Economic Growth' (2010) 69 *Ecological Economics* 2255, 2259; see also C Paton 'Nuclear must be affordable, says Nene' *Business Day* (Johannesburg) 24 August 2015.

[105] Eberhard *et al* (note 100 above) 32.

[106] T Morgan 'Reforming Energy Subsidies: An Explanatory Summary of the Issues and Challenges in Removing or Modifying Subsidies on Energy That Undermine the Pursuit of Sustainable Development' UNEP/Earthprint (2002); International Energy Agency (IEA) 'Tracking Clean Energy Progress 2013, OECD/IEA (2013) 136.

electricity leading to wasteful and unsustainable consumption patterns.[107] This is the general impact of subsidies in a developed country context, but when one move to developing countries energy subsidies can play a critical role in promoting access to energy and reducing energy poverty, that is in real value terms the government is helping people who are in real need of subsidisation in order to access energy.

This argument must be qualified with evidence, which suggests that there are free riders among the beneficiaries of subsidies on electricity and that, often, the subsidies in developing countries benefit those who can afford electricity in the first place.[108] The recent evidence of Eskom's negotiated deals with the iron and steel companies that pay less than residential consumers is further proof that subsidies may not be serving their purpose. Lack of transparency in electricity pricing compounds this challenge, as shown in the *BH Billiton* special pricing contracts case.[109] Big industrial consumers negotiate low fixed prices for electricity with state utilities supposedly in exchange for investing in the country and providing other economic returns.[110]

In South Africa, it has been revealed that some major industrial consumers of electricity often pay less for the resource than domestic users due to long-term contracts negotiated with the state utility in recognition of the economic contribution of such big consumers.[111] These contracts are being questioned regarding their sustainability and whether in fact the government benefits from such lop-sided contracts.[112] In addition to these contracts, the government of South Africa is hailed as a leader in rural electrification under its

---

[107] D Pimentel 'Renewable and Solar Energy Technologies: Energy and Environmental Issues' in A Eberhard et al *Africa's Power Infrastructure: Investment, Integration, Efficiency* (2011) 13; see also CJ Holton 'What are the Effects of Fossil-Fuel Subsidies on Growth, the Environment, and Inequality?' (2012) 7 and 9.

[108] Ibid, Eberhard 115 and 117; G Ruiters 'Free Basic Electricity in South Africa: A Strategy for Helping or Containing the Poor' in McDonald (note 53 above) 256.

[109] *BHP Billiton PLC Inc & another v De Lange & others* 2013 (3) SA 571 (SCA); [2013] 2 All SA 523 (SCA) (15 March 2013); *De Lange and Another v Eskom Holdings Ltd and Others* 2012 (1) SA 280 (GSJ).

[110] Eskom has often consulted these big consumers to find ways to reduce their consumption to stabilise the grid and prevent unplanned outages, yet this does not justify long-term low tariff commitments at the expense of other low-level consumers.

[111] See the cases in note 109 above.

[112] Ibid

rural electrification programme,[113] – again this resource is heavily subsidised, as most rural consumer cannot pay for electricity.

Some of the response strategies to address energy poverty[114] have exacerbated the demand situation resulting in spiralling demand without the required capacity expansion. What emerges from these policy interventions is that South Africa has used access to energy policies and rural electrification programmes to overcome energy poverty in the country. However, dwindling supply capacity has eroded the gains made under these access programmes. Most of these programmes have done little to promote renewable energy as they can only sustainably be supported by cheap fossil energy. Rural electrification is a lost opportunity to deploy distributed and small scale renewable electricity projects in South Africa.

It is evident that the failure to reduce fossil fuel subsidies and other indirect public support for conventional sources of electricity remains a challenge for renewable energy in South Africa. Market based response strategies are required to address this barrier. As long as Eskom retains its grip on the electricity energy sector and it maintains its good financial arrangements with its major shareholder the government, it is difficult for IPPs to compete with Eskom in terms of generating capacity. It is either that the government provides start-up capital incentives for renewable sources whether by Eskom or IPPs or that it gradually reduces its support to Eskom's conventional power. This latter option is, politically, very difficult for the country given that up and downstream industries and families depend on the coal value chain and associated energy industries. Hence, the argument that to facilitate the role of out of renewable

[113] National Integrated Electrification Programme (INEP) has seen connection rise from 36% in 1994 to 84% in 2014 20 years after apartheid, Keynote Address by the Honourable Minister of Energy, Ms Tina Joemat-Petersson, at The Renewable Energy Conference in Kimberly on 30-31 October 2014, 4.

[114] For instance, the access to basic energy programme, which was not complemented by expansions of capacity and thereby increasing demand while supply was decreasing in South Africa. Hence the paradox of a government celebrating millions of new connections while in darkness due to load shedding.

energy on a large scale, the Eskom-state support status quo must be dismantled.[115]

6.2.2. Procuring energy from Independent Power Producers (IPPs)

The IPP Procurement programme is the implementing mechanism adopted by South Africa to implement its renewable electricity private sector participation strategy.[116] The programme is an offshoot of the FITs mechanism, which failed to take off due to institutional and legal complications.[117] The IPP Procurement for renewable energy, the REIPPPP was gazetted in 2012 by the Minister of Energy to implement the New Generation Capacity Regulations of 2011 discussed in Chapter 4.3.1 above.[118] While it was legally necessary to move from FITs to an auction or bidding systems in South Africa the two mechanisms are not very different. The auction systems enables IPPs to deal with market entry barriers and financing challenges as the system provided a framework for government to provide guarantees through power purchase agreements (PPA), guaranteed grid access and sustainable price guarantees to IPPs.[119]

The auction system is not fundamentally different from FITs. The main difference is the procedure for determining the tariff and the actual procurement

---

[115] Pegels (note 40 above) 4953; P Lloyd 'Restructuring South Africa's electricity supply industry' (2012) 64 *Focus-The Journal of the Helen Suzman Foundation* 4, 15.

[116] The Renewable Energy IPP Procurement Programme has been structured to consist of possibly 5 separate Bid Submission Dates specified in clause 10 (Timetable for IPP Procurement Programme) and therefore, possibly 5 separate Bid Submission Phases. The First Bid Submission Date will be 4 November 2011. 'If, at the First Bid Submission Date, there are insufficient Compliant Bids to provide all of the MW allocated to a particular Technology or Technologies, the remaining available MW, initially allocated to each undersubscribed Technology, will be made available for allocation to Bidders which submit Bid Responses by the Second Bid Submission Date, subject to the provisions of clause 9.4 of this Part A (General Requirements, Rules and Provisions'). (Bid RFP Document).'

[117] T Creamer 'Renewables bid represents 'substantive progress', but raises compliance burden', *Engineering News* 23 August 2011. For a sustained case for FITs see, L Du Toit (note 6 above) 278-334 (my view is that the auction system is more preferable given the pricing advantages and its potential to create competition and a market and less burden on the state).

[118] IPP Procurement Programme 2012 GN 1074 in GG 36005 of 19 December 2012.

[119] For a review of the success, failures and achievements of the REIPPPP programme see generally, Eberhard, Koeller & Laigland (note 42 above); KN Gratwick & A Eberhard 'An Analysis of Independent Power Projects in Africa: Understanding Development and Investment Outcomes' (2008) 26 *Development Policy Review* 309-338; M Hantke-Domas 'The Public Interest Theory of Regulation: Non-Existence or Misinterpretation?' (2003)15 *European Journal of Law and Economics* 165-194.

process itself.[120] FITs are less competitive compared to the auction system. Hence, the contention that the policy shifts in South Africa were motivated more by legal complications than technical preferences.[121] The table below is a comparison of the differences and similarities between FITs and auction-based systems of renewable energy procurement.

	Feed-in tariff	**Auction-based tariff**
Alternative terms	Standard offer contracts, advanced renewable tariffs	Renewable tenders, tendering systems, competitive biddings
Definition	• Generation-based payment for electricity, • predetermined by policymakers and constantly available to project developers	• Generation-based payment for electricity, • determined and allocated through auction-based tenders in which project developers compete.
Determination of tariff	Predetermined by policymakers	Auctions-based tenders
Availability of [incentive] support	Constant	Periodical (bidding windows)

Comparison of FITs and Auction (bidding) systems adapted from Becker & Fischer.[122]

The table indicates that the differences between the two models of procurement are insignificant at the technical level. However, taken in the context of other

[120] Becker & Fischer (note 43 above) 446, 447; Baker & Wlokas (note 73 above) 5.

[121] Becker & Fischer (note 43 above) 452 ('South African policymakers had to develop a comprehensive generation-based policy within the limitations of the country's legal and institutional framework. At first, government officials sought to put their country at the forefront in RET deployment with a well-resourced FIT scheme.)

[122] Ibid 447; see also L Du Toit (note 6 above) (a concurrent study brought to my attention late in 2014 which presents a sustained argument for implementing FITs in South Africa. The author also discusses in greater detail the merits of FITs and auction system referencing experiences in Germany, Spain, India and China as such, these comparisons are not repeated at any length in this study); A Eberhard "Feed in Tariff or Auctions? Procuring Renewable Energy Supply in South Africa' (2014) *Energize RE: Renewable Energy Supplement* 36, and A Eberhard & K Gratwick 'Investment Power in Africa: Where from and where to?' (2013) *Georgetown Journal of International Affairs* 39, 44 (arguing that the bidding/auction system creates more competition and bring investors compared to FITs.)

public procurement regulations[123] and competition regulation the implementation of the two models could face different challenges in South Africa.

The policy prevarication from a FITs based mechanism to an auction based bidding system – the REIPPPP caused some uncertainty as investors and the private sector had geared up to enter the electricity sector once the FITs were promulgated. However, the level of interest and success rate of the REIPPPP indicates that the legal and policy uncertainties created by the abandonment of the FITs were short-lived.

The implementation of the REIPPPP has met with relative success[124] especially given that it is largely experimental and a first for South Africa as a Sub-Saharan developing country.[125] The REIPPPP aims to procure 17.8GW of energy by 2027 in successive bidding windows or phases.[126] A total of 2 400MW of capacity was awarded in Bidding Window 1 and 2 for solar photovoltaic, onshore wind, concentrated solar, landfill gas, biogas, small hydro, biomass and 651,94MW was operational by June 2014 and most Bidding Window 2 projects are expected to come online by 2016.[127] Under the last Bidding Window 3 in 2013, 1 473MW was awarded.

An evaluation by Eberhard *et al* shows that the programme has substantially overcome several economic and structural obstacles to renewable

---

[123] Preferential Procurement Policy Framework Act 5 of 2000 and its Regulations and the Constitution of South Africa section 217.

[124] Measured against the five criteria developed by IRENA, see IRENA 'Evaluating Policies in Support of the Deployment of Renewable Power' Bonn: International Renewable Energy Agency (IRENA) (2012) 11 (the criteria focuses on Effectiveness, Efficiency, Equity, Institutional Feasibility and Replicability). The Minister reported that 'South Africa [is] now being ranked number 9 on the Top 10 Clean Energy Investment countries according to Bloomberg New Energy Finance. South Africa attracted US$4.9 billion in 2013, US$5.7 billion in 2012' in renewable energy investments under the REIPPPP 'Keynote Address by the Honourable Minister of Energy, Ms Tina Joemat-Petersson at the Renewable Energy Conference' 30 October 2014.

[125] Recent comprehensive empirical reviews of the REIPPPP programme include: McDaid (note 39 above); Eberhard, Koeller & Laigland (note 42 above); Baker & Wlokas (note 73 above); G Montmasson-Clair, K Moilwa & G Ryan 'Regulatory Entities Capacity Building Project, Review of Regulators Orientation and Performance: Review of Regulation in Renewable Energy' Centre for Competition, Regulation and Economic Development (CCRED) (2014) 80.

[126] The IRP 2 is targeting 42% of renewable energy by 2030 in South Africa

[127] REIPPPP Projects Status Report, Department of Energy (June 2014) <http://www.energy.gov.za/IPP/Electricity-Infrastructure-Industry-Transformation-30June2014.pdf >; see also Walwyn & Brent (note 73 above) 396.

electricity by stimulating financing and investment on the back of government guarantees and support.[128] Undoubtedly, the REIPPPP represents a measure of successful planning against some of the obstacles to renewable electricity in South Africa. Clearly, the programme was anchored by the triangular agreements involving Eskom, the Government, and the IPP,[129] requiring Eskom to enter into a Power Purchase Agreement (PPA) guaranteed by government support through the Department of Energy, which has largely retained control of the programme. This structure gave the private sector and potential investors sufficient motive to bankroll the winning bidders' projects.[130] That as at 15 January 2015, 1 512.72 MW from the REIPPPP was commercially online,[131] which is less than 5 per cent of the peak demand of about 35 000MW and Eskom's installed capacity of about 45 000MW,[132] is a stark reminder of the reality that renewables are contributing an insignificant percentage to the energy mix. This gap will grow with more coal coming online from Medupi and the planned IPP procurement for coal and gas base load as well as planned nuclear new build.

Nevertheless, the apparent success of the REIPPPP should not overshadow remaining challenges that IPPs are still faced with in trying to break into the energy sector. Eskom and the Department of Energy remain in full control of the quantity of electricity required and the sources preferred in the

[128] Eberhard, Koeller & Laigland (note 42 above) 19 (funding challenges dealt with as REIPPPP provided a secure investment platform); see further Eberhard & Gratwick (note 122 above) 44.
[129] Once a bidder wins they must form a Project Company, conclude an Implementation Agreement, a Power Purchase Agreement, a Direct Agreement, a Transmission Agreement or a Distribution Agreement and a Connection Direct Agreement with the other actors involved.
[130] Official status reports and statistics for the REIPPPP programme are available at: <http://www.energy.gov.za/files/events_overview%20IPP.html>
[131] Lebogang Mojanaga 'Energy Programmes and Projects: Electricity Infrastructure/ Industry Transformation' Department of Energy, REIPPPP Projects Status Update (15 January 2015) <http://www.energy.gov.za/IPP/Electricity-Infrastructure-Industry-Transformation-13January2015.pdf >.
[132] Peak demand statistics from NERSA System Adequacy Report, Issue 6, 15 January 2015 < http://www.nersa.org.za/ >, Eskom's installed capacity is forecasted to grow to 47 697MW (2016) and 49 864 (2017) including imports.

bidding process.[133] This defeats the full liberalisation or opening up of the electricity supply industry to private sector participation. A recent empirical study has concluded that 'many stakeholders assert that the flip side of [the REIPPPP] requirements has meant that [REIPPPP] has been a complex and expensive process with very high compliance costs.'[134]

The REIPPPP is probably the most direct and earnest response to the institutional and market barriers to renewable energy. If implemented to the letter, the programme has potential to move South Africa towards an energy mix where renewables contribute a higher percentage. Since its inception, the REIPPPP has resulted in 64 IPPs being awarded contracts to supply renewable electricity. It is reported that in the third bidding window, which closed in August 2013, wind was bid at a lower price[135] compared to the price of electricity to be generated from Medupi coal power station. This is evidence that renewable electricity can in fact compete with conventionally produced electricity if the correct pricing and regulatory policies are in place. Full cost accounting for Medupi coal power probably account for the higher price of electricity from coal than anything else. The International Energy Agency rightly concludes, on price competitiveness, that 'even if cost competitiveness or adequate incentives allowed a [renewable energy] project to be profitable in principle, *significant barriers and investor risk perceptions generally remain*.'[136] This is the case with REIPPPP in South Africa.

6.3. Indirect drivers for renewable electricity

The drivers of the demand to transition for an energy mix where renewable sources plays a greater role is varied as noted Chapter 1. In summary, there

---

[133] For instance, the 'List of Preferred Bidders for the Third Bid Submission Phase' 05 November 2013 <http://www.ipprenewables.co.za/gong/widget/file/download/id/199> shows that total bids received (93) were for 6 023MW but only 1 473MW was available. This confirms the argument that the REIPPPP is being seen as stop gap measure to meet Eskom's shortfall rather than a robust programme to grow the renewable energy sector.

[134] Baker & Wlokas (note 73 above) 8.

[135] Eberhard, Koeller & Laigland (note 42 above) 14.

[136] O Muller et al 'Renewable Energy: Policy Considerations for Deploying Renewables' OECD/IEA 2011, 57.

are three major drivers, namely the prospect of non-renewable fossil fuel source being depleted, secondly as a measure to reduce the emission of greenhouse gases and lastly as a way to promote sustainable development and sustainable living. These drivers correspond to certain response measures that countries are taking to promote renewable electricity. In this regard, South Africa has taken steps in other sectors part from the energy sector whose effect is to indirectly discourage the use of conventional sources of energy or provide incentives for renewable ne clear energy sources. The next section of the study focuses on regulation through environmental economic or fiscal instruments that seek to respond to the economic barriers to renewable energy.

6.3.1. Environmental fiscal and tools to promote renewable energy

One of the objectives of this study is to show that renewable energy is necessary to enable South Africa to reduce its GHG emissions and carbon footprint. In energy law fiscal tools are often used to achieve environmental objectives (e.g. pollution control charges, authorisations and permitting fees). For some time South Africa has been using fiscal environmental instruments to respond to the pollution and environmental degradation coming from economic activity including energy production and consumption.[137] South Africa introduced an electricity environmental levy to ensure that energy producers pay for the adverse environmental impacts of generating energy from fossil

[137] Paterson (note 25 above) 296, 327; AR Paterson 'Pruning the Money-Tree to Ensure Sustainable Growth: Facilitating Sustainable Development through Market-Based Instruments' (2006) 3 *PELJ* 12/27 (extensive analysis of the Draft Fiscal Reform paper including the proposal for a 'fuel consumptive tax and a fuel input tax' in the electricity sector, and generally highlighting the advantages of using market –based instruments.) ; National Treasury, South Africa 'A Framework For Considering Market-Based Instruments to Support Environmental Fiscal Reform in South Africa' (2006) <http://www.treasury.gov.za/public%20comments/Draft%20Environmental%20Fiscal%20Reform%20Policy%20Paper%206%20April%202006.pdf> which culminated, after some years, into the Carbon Tax Policy Paper, Reducing Greenhouse Gas Emissions and Facilitating the Transition to a Green Economy (2013); S Devarajan *et al* 'Tax Policy to Reduce Carbon Emissions in South Africa' *World Bank Policy Research Working Paper Series* (2009) 27 (World Bank evaluation of the possible impact of a carbon tax in South Africa); H Winkler & A Marquard 'Analysis of the Economic Implications of a Carbon Tax' (2011)22 *Journal of Energy in Southern Africa* 55, 62-63 (assessing impacts of carbon tax in South Africa focusing on three key aspects namely, 1) effects on the poor, 2) determining appropriate level of taxation and 3) competitiveness of energy intensive industries).

fuels.[138] While a number of market-based incentives in the form of environmental taxes have been in place, studies bemoan the lack of alignment between such taxes, and the environmental objectives of promoting clean energy and reducing pollution.[139] Market-based incentives however represent a promising form of regulation that could promote renewable energy. While an exhaustive discussion of market based instruments in general is beyond the breath of this study,[140] it is necessary to mention that these come in mainly four forms, namely user and pollution charges, tradable permits including cap-and-trade systems, measures to remove market barriers or creating markets, and removal of government subsidies.[141] Not all of these are relevant to the current investigation, for instance government financial support through rebates and subsidies are proposed in this study as necessary to kick-start renewable private sector involvement – contrary to the traditional conception that they must be reduced or removed altogether.

Recently National Treasury produced a Carbon Tax Policy Paper, which forecasts the implementation of a carbon tax system in January 2016. In the 2014 Budget Speech[142] the Minister of Finance proposed to levy a tax on carbon emissions by 2016 details of which are provided in a draft carbon tax

---

[138] Environmental Levy on Electricity Generated in South Africa, Item 148.01 of Schedule 1 Part 3B in terms of the Customs and Excise Act 1964, effective 15 August 2014.
[139] Paterson (note 137 above) 16/27.
[140] For such detailed historical analysis see, RN Stavins 'Market-based Environmental Policies' in PR Portney & RN Stavins (eds) *Public Policies for Environmental Protection* Resources for the Future 2nd ed (2000) 31-76; RN Stavins 'Experience with Market-Based Environmental Policy Instruments' in K-G Mäler & J Vincent (eds) *Handbook of Environmental Economics* Vol.1 (2003) 355-435, and in South Africa see notes 25 and 137 above; L Du Toit (note 6 above) 92-132; JG Cargill 'The Role of Market-Based Instruments that Use Existing Markets to Promote Energy Efficiency in South African Industry' Dissertation submitted in partial fulfilment of the requirements of MPhil degree, at the University of Cape Town (2011).
[141] Stavins, ibid 33 and 34 (adding that market based instruments are better than command and control regulation due to their cost-effectiveness and potential to stimulate innovation in new technologies); L Du Toit (note 6 above) 92-96 (discussing in detail the advantages of command and control measures).
[142] Government of South Africa, Minister of Finance, Budget Speech (26 February 2014), 25.

policy paper.[143] This is the most recent integrated policy statement position on climate change, renewable energy, and market based instruments focusing on carbon tax. The proposal is to put a price on carbon that can be used to tax greenhouse gas emitters in South Africa with the hope that the tax can act as a disincentive for reliance on conventional energy or unsustainable energy usage patterns.[144]

The tax is essentially a tax on fuel inputs and sets a threshold that vary according to the type of industry concerned, with some industries paying more than others. Furthermore, the proposed tax provides for exemptions indirectly through these thresholds. Some key energy intensive and trade intensive sectors have been exempted altogether to prevent the tax from resulting in South African firms being outcompeted on the international markets. The proposed tax has been criticised by pro-environment critics as being set at too low a rate to achieve the stated environmental objectives of the tax – to reduce GHG emissions. The Long Terms Mitigation Strategy (LTMS) forecasted that any carbon tax that is lower than R100/tCO_2-eq would not meet the required reduction in emissions.[145] Similarly, it has been argued that setting thresholds that result in virtual exemptions is not optimum, as ideally the tax should apply across sectors equally to encourage movement towards a low carbon economy. However, contrary arguments are that the carbon tax may result in unrealistic electricity prices.[146]

Further, criticisms are that the tax revenue may not be directly useful as a disincentive for carbon intensive practises as it does not result in the burden

---

[143] 'Environmental Fiscal Reform Policy Paper' (initially published in April 2006) recent published in a revised form as Carbon Tax Policy Paper (note 137 above) (Key design features of the carbon tax are outlined), see National Treasury 'Press Release, Updated Carbon Tax Policy Paper: Request for Public Comments' <http://www.treasury.gov.za/public%20comments/Press%20Release%20%20Carbon%20Tax%20Policy%20Paper%202013.pdf >

[144] 'Comments on the Carbon Tax Policy Paper issued by National Treasury in May 2013' Energy Research Centre, University of Cape Town, submitted September 2013, 1.

[145] Du Toit (note 6 above) 225.

[146] The Human Sciences Research Council (HSRC) estimates that carbon tax would initially raise the cost of electricity by between about 10% to 19% eventually by 20% to 30% with serious economic implications. See also H Winkler & A Marquard 'Analysis of the Economic Implications of a Carbon Tax' (2011) 22 *JESA* 65.

of electricity price on the poor being reduced.[147] That is, it is not clear that the tax revenue will be used to aid industry and energy users to move towards environmentally clean energy especially in the electricity sector.[148]

Many countries have implemented carbon taxation with some positive results, whole others did not achieve much by way of changing energy choices and consumer behaviour.[149] This reflects the comments by the NERSA on the proposed carbon tax, that:

- A carbon tax will have a direct impact on electricity prices; Price increases have negative behavioural consequences when the person paying the increased price has limited or no options to respond.
- A carbon tax is inappropriate for the centrally planned and controlled South African electricity sector. It may be effective in the case of a liberalized market.
- Regulations and regulatory rules would be more effective to influence the technology choice, the dispatch of generation, and the efficient use of electricity.[150]

These criticisms resonate with the challenges that the EU Carbon Trade system faced – i.e. which were not as successful as anticipated – while the carbon price was set, there were still incentives for carbon intensive sectors.[151] This is has led to the argument that:

> [a] system of pollution taxes will in many cases be more efficient in reducing the damage costs of pollution than a command and control system of environmental regulation, because it allows the market to make the right decisions for optimal abatement strategies, while maintaining the same goal. In practice, however, placing taxes on electricity in developing countries can potentially conflict with other social objectives.[152]

---

[147] G Dowes 'National Treasury's Discussion Paper On Reducing Greenhouse Gas Emissions "The Carbon Tax Option" ' comments on National Treasury Carbon Tax Policy Paper by Eskom. (2011)
< http://www.treasury.gov.za/divisions/tfsie/tax/CarbontaxWorkshop/Eskom.pdf >
[148] Energy Research Centre 'Comments on the Carbon Tax Policy Paper issued by the National Treasury in May 2013' University of Cape Town, September 2013, 12-13.
[149] Owen (note 102 above) 639-640.
[150] T Bukula 'NERSA Comments on Carbon Tax Discussion Paper' Presented to National Treasury, 16 March 2011, 7.
< http://www.treasury.gov.za/divisions/tfsie/tax/CarbontaxWorkshop/NERSA.pdf >
[151] BP Energy Outlook 2013.
[152] R Spalding-Fecher & DK Matibe 'Electricity and Externalities in South Africa' (2003) 31 *Energy Policy* 721,728. (footnotes omitted)

While the National Treasury claims that '[t]he primary objective of implementing carbon taxes is to change future behaviour, rather than to raise revenue'[153] the design features, existing taxation infrastructure and institutional process can make it challenging to appropriately channel the tax towards the intended environmental objectives. National Treasury is designing the carbon tax for implementation in 2016 prefers to use central budgeting to support low carbon and energy efficiency initiatives rather than targeting tax revenue.[154]

However, it is undeniable that if properly implemented a carbon tax could be an effective response to the behavioural apathy among energy consumers. It could send the correct price signals that can change behaviour and enable the uptake of renewables as alternatives to a highly taxed fossil based energy. What is also clear is that implementation of environmental taxes that could create difficulty for the poor or energy intensive industry without other options will be unsuccessful. This is where renewable sources play a critical role as alternatives.

6.3.2. Climate change as a launch pad for renewables

Climate change is one of the most urgent global environmental problem. Rightly so, it has been labelled an 'energy problem' as addressing it requires reducing emission of GHG emissions that mainly come from the energy industry.[155] The IPCC recently released the 5th Assessment Report, which reconfirms that human activity accounts for the greatest part of greenhouse gas emissions.[156] The science is becoming more clearly overwhelming in favour of

[153] National Treasury Press Release (note 143 above).
[154] Cecil Modeni, Chief Director Economic and Tax Analysis, Department of National Treasury, argues that the objectives will be achieved through revenue recycling, rather than ring-fencing the carbon tax revenue. Support will then come directly through budgetary support for energy efficiency, tax incentives for research and development on green technology, phasing down electricity levy, tax exemption for carbon off-set projects, among other initiatives, 'South Africa' Carbon Tax Proposals' paper presented at the Workshop on South Africa's Climate Change Response: The Road to Implementing a Carbon Tax' Wits University, 24 March 2015.
[155] Energy Research Centre 'Comments on the Carbon Tax Policy Paper issued by the National Treasury in May 2013' University of Cape Town, September 2013, ii.
[156] O Edenhofer *et al* (eds) *IPCC, 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (2014) 358.

anthropocentric emissions as the biggest cause.[157] However, internationally there has been a shift towards voluntary political solutions rather than legally binding targets towards reduction of emissions by countries.

The relevance of climate change to renewable energy is that it shows the need for policy coherence and alignment across sectors. It has thus been contended that, '[e]lectricity is the largest single sector of GHGs emissions in South Africa. So while mitigation cannot be achieved in electricity supply alone, it is impossible without reducing emissions from Eskom and IPPs.'[158] These observations resonate with the comments by NERSA[159] and Eskom[160] on the proposed carbon tax in South Africa.

Some of the key indirect drivers or incentives for a transition towards renewable energy are climate change mitigation and adaptation measures.[161] How do climate change policies act as either incentives to move towards renewables or disincentive to use conventional sources of electricity? Climate change policies could force energy intensive industries to consider low-carbon energy inputs. The South African government has so far produced a number of climate change related policies that, if properly implemented to guide legal instrument development, could potentially act as indirect disincentives to use conventional sources of electricity.[162] Such a recent policy is the Climate Change Response White Policy of 2011. The White Paper proposes strategies that the government will implement in certain industrial sectors to mitigate the emission of greenhouse gases as well as initiate adaptive contact or behaviour. Two of the flagship programmes expected to play a central role are in the

---

[157] Stocker TF et al (eds) *IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (2013).
[158] Energy Research Centre (note 155 above) 17.
[159] T Bukula (note 150 above)
< http://www.treasury.gov.za/divisions/tfsie/tax/CarbontaxWorkshop/NERSA.pdf >
[160] G Downes (note above)
< http://www.treasury.gov.za/divisions/tfsie/tax/CarbontaxWorkshop/Eskom.pdf >
[161] VR Baros *et al* (eds) *IPCC 2014: Climate Change 2014: Impacts, Adaptation and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel On Climate Change* (2014) 1200 *et seq* (detailing climate change impacts and vulnerability for African region).
[162] Eberhard, Koeller & Laigland (note 42 above) 9 (commenting that climate change mitigation policies have driven renewable energy implementation more that any energy policies); see also Du Toit (note 6 above) 34.

electricity sector. Apart from the Energy Efficiency and Energy Demand Management Flagship Programme,[163] the Renewable Energy Flagship Programme[164] in the electricity sector is regarded as key to the success of the climate change mitigation strategies.

These two programmes are leading initiatives to reduce demand for electricity and improve efficiencies as well as spearhead renewable energy projects that have been implemented in South Africa no matter how small. Energy Efficiency is regarded as the low hanging fruit representing small steps that could be taken in the short term to reduce the need to increase generation capacity. Apart from improving efficiency, demand side management also assists with raising public awareness of the need to use energy wisely and make informed energy choices, a crucial aspect in the process of transitioning to renewable sources of electricity.

Climate change mitigation strategies must be informed by the local social, economic, and cultural conditions, otherwise policy misalignment[165] could result in other regressions and losses that render the interventions counterproductive. For instance, one of the paradoxes of the Germany *Energiewende* programme is that while Germany increase use of renewables, its GHG (CO_2) emissions did not go down proportionately,[166] given the use of coal power for base load. South Africa risks the same paradox with its continued coal build programme. This calls for policy alignment and consistence across sectors. While it is expected that climate change mitigation strategies may result in unemployment in the near-term, there are opportunities to grow

[163] As part of the Energy Efficiency and Energy Demand Management Flagship Programme, the Department of Energy will continue to develop and facilitate an aggressive energy efficiency programme in industry, building on the experience of Eskom's Demand Side Management programme and the DTI's National Cleaner Production Centre, and covering non-electricity energy efficiency as well.

[164] The Renewable Energy Flagship Programme is inclusive of a scaled-up renewable energy programme, based on the current programme specified in the IRP 2 and using, for example, the evolving South African Renewables Initiative led by the Department of Public Enterprise and Department of Trade and Industry, as a driver for the deployment of renewable energy technologies.

[165] Tyler (note 43 above) 583.

[166] P Graichen & C Redl 'The German Energiewende and its climate paradox. An analysis of power sector trends for renewables, coal, gas, nuclear power and CO2 emissions 2010–2030.' *Analysis No. April 2014* (2014)15.

the green jobs[167] pool quickly in the medium to long-term, but his entirely depends on global technology transfer, funding and uptake of the renewable energy or low carbon technologies. This approach augurs well for the generally accepted view that renewable energy is necessary, not only to reduce GHG emissions, but also for other energy sustainability imperatives discussed previously in this thesis. Therefore, climate change or no climate change, it is a prudent regulatory decision to steer the energy sector towards a mix that affords renewables a greater share given their sustainability, environmental advantages and the health and environmental impacts of conventional sources of energy, apart from climate change and global warming. Energy security and affordability are critical indicators globally and locally that are shaping the call for the transition to renewable electricity.

The International Energy Agency has observed that interventions to promote renewable energy must be properly contextualised[168] to ensure that strategies adopted are not misaligned to legitimate socio-economic objectives of each country. South Africa faces an immediate challenge of promoting job creation and poverty to alleviation. Any climate change linked interventions in the energy sector that are not properly optimised could worsen the unemployment situation and tilt the scales of poverty and dependence on social welfare services. As a recent World Bank survey of studies on green jobs noted:

> The impression given by many of the findings [of various green jobs studies] is that climate change policies in general and renewable energy in particular can generate considerable extra employment. However, many studies ignored the potential for job destruction in non-green industries or implicitly or explicitly assumed that there would be no crowding out of jobs via general equilibrium effects. Most studies did not take into consideration general equilibrium effects at all while some others offered a qualitative discussion. Few of the studies considered labour market problems such as sector specific human capital and job search costs that could slow the shift of workers across sectors or out of long-term structural unemployment.[169]

---

[167] H Winkler & A Marquand 'Changing Development Paths: From an Energy-Intensive to Low-Carbon Economy in South Africa.' (2009) 1 *Climate and Development* 47, 57.
[168] Muller (note 136 above) 57.
[169] A Bowen ''Green' Growth, 'Green' Jobs and Labor Markets' *World Bank Policy Research Working Paper* No 5990 (2012), 13-14.

Therefore, while it is clearly the mandate and within the power of governments to introduce market creating and other incentives for renewable electricity, this mandate must be exercised cautiously with all factors being considered in policy and instrument design. This is precisely the reason why comparisons with developed country success stories[170] in renewable electricity must be qualified in all respects.

The Constitution of South Africa by introducing a right to an environment not harmful to heal and wellbeing, premised on the state's obligations to enact legislation and take other measure to prevent pollution and promote justifiable sustainable social and economic development, is a key incentive for the government to indirectly take measures that could promote renewable energy. Any environmental measures taken to prevent or reduce pollution from conventional sources of energy are in fact a measure to fulfil the state's constitutional obligations as full discussed above.[171] This point is reiterated here to note the significance of environmental regulation (climate change response) in provided regulators with space to create incentives of renewable energy.

An area of environmental regulation that could be used effectively is the control of air pollution as air pollution from the energy generation is the major contributor to GHG emissions. As demonstrated in Chapter 5 (5.5), stricter norms and standards and atmospheric emission standards could be a good disincentive for the continued reliance on conventional sources of electricity. In addition, the air pollution laws are normally used to introduce a carbon market that could lead to a carbon trading system. To date several regulations[172] made in terms of the Air Quality Act could, if implemented, not only reduce the level of GHG emissions,[173] but also cajole energy companies to start thinking seriously

---

[170] Germany, Spain, Denmark have different poverty and socio-economic development profiles compared to South Africa. What has worked there will certainly not work in South Africa without further work on the redesign and configuration of the policy instruments and the structure of the economy.

[171] See discussion in Chapter 4 above.

[172] Section 59 Air Quality Act - Minimum Emission Standards (MES) published in GN 893 in GG 37054 of 22 November 2013; Listed activities and associated minimum emission standards identified in terms of section 21 of the Act GN 893 of 2013 GG 37054 of 22 November 2013; National Ambient Air Quality Standards GN 1210 of 2009 *GG* 32816 of 24 December 2009.

[173] Du Toit (note 6 above) 32-33 (pointing out the air pollution impact of fossil-based energy).

about sourcing electricity from renewable sources or alternatively using low-carbon technology in their industrial and production processes. Depending on the regulation in question, it may be entirely up to the regulated entity to produce alternative power from renewable sources or to invest in clean production technology depending on the costs involved.

The Climate Change White Paper and programme on renewable energy therefore represents a fundamental response to economic and structural barriers to renewable energy. The strategies in the Climate Change White Paper are cross cutting addressing issues in the agriculture, water, forestry, and environmental sectors. However, the absence of laws to implement these strategies remains a challenge.[174] An important aspect of the Climate Change White Paper is the elevation of the energy demand side management interventions as key programme that could enable mitigation and adaptation and thereby reduce the need for more energy capacity.

6.3.3. Managing demand through energy efficiency

While energy efficiency and demand side management strategies are primarily there to manage demand, these measures could indirectly present opportunities to promote the uptake of renewable energy. Firstly, energy efficiency measure can enable the energy intensive industry to adapt to processes and technology that is low-carbon and less energy intensive,[175] – most of which is renewable energy technology. Secondly, demand side management measures can create opportunities to deploy market-based instruments that can have spill over effects on the attractiveness of renewable energy technologies. It is in this

[174] J Krupa & S Burch 'A New Energy Future for South Africa: The Political Ecology of South African Renewable Energy' (2011) 39 *Energy Policy* 6254, 6258-6259.
[175] Winkler & Marquand (note 167 above) 56 (adding that 'Energy efficiency has great potential, but widespread implementation requires effort').

category that one can place the allowable deduction for energy efficiency measures in terms of s 21 L of the Income Tax Act.[176]

The first targeted steps that the government took is developing the energy efficiency policy[177] which focuses on promoting sustainable efficient use of energy in the hope that reduced demand could fend off the need to increase generating capacity through construction of new coal fired power plants. Several initiatives were developed to implement the efficiency and demand reduction strategies.[178] While energy efficiency can be a delaying tactic – an excuse to avoids making the hard choice to transition to more renewable energy – it certainly can be useful to drive the transition. It is the low-hanging fruit that can ensure reduction of GHG emissions from the energy sector immediately without a lot of investment. However, it can only be useful to the green transition if it is complementing efforts to promote renewable energy.[179] Hence it has been argued that economically, energy efficiency can have unintended consequences – the so-called 'rebound' or 'takeback' effect – where consumers increase consumption arising from efficiency savings and the impact thereof on prices.[180]

Energy efficiency, as a response mechanism to increased energy demand, has relatively been partially successful in stabilising demand in South Africa especially after 2008 until capacity constraints returned in late 2014. In 2011 and 2012, South Africa nearly went through the peak demand season

---

[176] Regulations in Terms of Section 21L of the Income Tax Act 1962, on the Allowance for Energy Efficiency Savings, GN 971 in GG 37136 of 9 December 2013, effective 1 November 2013 (allowing taxpayers to claim a deduction of 45c/kWh or equivalent for energy efficiency savings as measured against a baseline at the beginning of each tax year until 2020).

[177] National Energy Efficiency Strategy of the Republic of South Africa, GN 908 in GG 32342 of 26 June 2009.

[178] Eskom has a number of initiatives to reduce demand include (a) Demand Response, initiatives whereby the system operator can instruct consumers of electricity to reduce their immediate consumption/demand for a limited period of time in an attempt to balance demand and supply, normally for some form of incentive; (b) Emergency Demand Response: Customers reducing demand on request for a contracted saving. The use of Solar Water Heaters, compact fluorescent lamps (CFLs) and power alerts to raise awareness and enable consumers to make informed energy choices, and (c) The Energy Conservation Scheme (ECS) is a key element in the suite of solutions to reduce the supply/demand gap.

[179] H Herring 'Energy Efficiency- A Critical View' (2006)31 *Energy* 10, 18.

[180] LA Greening, DL Greene & C Difiglio 'Energy Efficiency and Consumption-the Rebound Effect-A Survey' (2000) 28 *Energy Policy* 389-401 (an explication of the economic concepts of 'rebound' and 'takeback' associated with energy efficiency).

without any load shedding showing that demand had been reduced to manageable levels.[181] However, the control over demand is very unpredictable and energy efficiency measures remain necessary to keep reminding consumers that the resource is scarce and in short supply. In its updated forecast for the IRP 2, the government noted a reduced demand to 2030. How can energy efficiency measures be used to respond to some of the barriers to renewable energy?

The strength of energy efficiency lies in that it requires relatively low investments into awareness campaigns and raising the awareness of electricity users.[182] Other energy efficiency measures may require investment into expensive technology to enable smart metering[183] and regulating appliances such as geysers, swimming pool pumps, investing in energy efficiency florescent bulbs, automatic lighting systems for building especially office blocks and malls, technology standards for appliances[184] and the like. These interventions require investment from both government and the affected industries to change production processes to comply with energy efficiency standards. The manufacturing sector could look at this as a costly process yet in the long-term it is worthwhile to produce low energy electric products.

Energy efficiency works better together with other demand side management market interventions such as tax rebates,[185] aimed at managing the demand and raising awareness among consumers. South Africa's on-going major programs aimed at promoting energy efficiency and demand side management are achieving some result but there is room for improvement. What can be observed, though, is that energy efficiency and demand side

---

[181] Demand side management measures included awareness campaigns, prime time TV screening of load status, etc.

[182] RL Ottinger 'Energy Efficiency: The Best Immediate Option for a Secure, Clean, Healthy Future' (2006) 30 *Natural Resources Forum* 318, 326-327.

[183] Metering that enables IPPs to feed electricity back into the greed from their own electricity generating activities.

[184] Department of Minerals and Energy, South Africa 'Energy Efficiency Strategy of the Republic of South Africa' March 2005
< http://www.energy.gov.za/files/esources/electricity/ee_strategy_05.pdf>

[185] Regulations in terms of S 21L of the Income Tax Act 1962, on the Allowance for Energy Efficiency Savings, GN 971 in GG 37136 of 9 December 2013, effective 1 November 2013. (allowing taxpayers to claim a deduction of 45 cents per kWh or equivalent for energy efficiency savings as measured against a baseline at the beginning of each tax year until 2020).

management interventions can gradually address some of the social acceptance and behavioural challenges to renewable energy. Consumers can get accustomed to using technology and equipment that uses less energy and thus can be powered by renewable energy. Such technology includes low-energy consuming light bulbs, efficient geysers and smart switches as well as consumers acclimatising to the idea that if they use less they get a financial rebate through the energy efficiency tax deductible.

Nevertheless, social and behavioural barriers are best addressed in the non-legal space that allows awareness raising, energy intelligence, and change management to take places so that consumers can shift away from the preconceptions that conventional energy is more secure and reliable than renewable energy. From the legal perspective, law can only aid in creating spaces for public participation in the formulation of energy and environmental laws as a way to build consciousness around energy choices and consumption.

6.4. Lessons unlearnt – from REIPPPP to nuclear resurgence.

The proposed IPP procurement programme for coal base load[186] is providing continued support for conventional electricity, which in the long-term could 'lock-in' fossil technology and nullify any gains to be made by renewable energy procured under the REIPPPP. This is aggravated by the unannounced resurgence of nuclear power in 2014,[187] which under the IRP 2, was not foreseen to be an immediate need[188] in the build trajectory for Eskom. The upsurge in the nuclear option has been heightened by global support from

[186] Baseload IPP procurement programme 2012, GN 1075 in GG 36005 of 19 December 2012 (a programme to procure baseload power from IPPs modelled on the REIPPPP).
[187] A Adamantiades & I Kessides 'Nuclear Power for Sustainable Development: Current Status and Future Prospects' (2009) 37 *Energy Policy* 5149, 5150; see also P Stoett 'Toward Renewed Legitimacy? Nuclear Power, Global Warming, and Security' (2003) 3 *Global Environmental Politics* 99.
[188] J van Wyk 'South Africa's Nuclear Future' South African Institute of International Affairs (SAIIA) Occasional paper 105, June 2013; D Gilbert 'South Africa's Future Nuclear Energy Plans: Pivoting on Foreign Policy Objectives and Raising Issues of Concern for Nuclear Non-Proliferation' CAI Analytical Research, November 2013 <http://www.consultancyafrica.com/CPunit/CAICounterProliferation_SAFutureNuclearPlans_Nov13.pdf >

research increasingly making causal links among GHG emissions-nuclear-renewables-climate change.[189] Among other things is argued that:

> [s]everal factors seem to be driving the resurgence of interest in nuclear power:
> - A global desire to diversify fuel sources, reduce dependence on fossil fuel imports, and develop immunity to power disruptions;
> - A desire to mitigate volatile fuel costs, given the low dependence of the price of nuclear-produced kilowatt-hours on the price of uranium;
> - The need to mitigate climate change by reducing greenhouse gas emissions—specifically, carbon dioxide;
> - A desire to decrease air pollution, by taking advantage of the virtual absence of air pollutants from nuclear plants; and
> - A way to prepare the transition towards a hydrogen economy.[190]

It is indeed clear that nuclear does, technically and scientifically, present opportunities to reduce GHG emissions and reduce a country's carbon footprint. However, what are underestimated are the consequences of nuclear energy on the physical, economic, and social environment. Economic sustainability is an issue on which the South African government does not seem to have learnt any lessons from the Pebble Bed Reactor project. Similarly, the process of producing energy from nuclear requires mineral resource extraction as antecedent activity that is heavily damaging on the environment and may negate any carbon lowering benefits.

Nuclear energy, in South African context is not a sustainable solution, in fact it is part of the problem – a part of the business as usual approach.[191] Ultimately, energy sources cannot be compared without acknowledging the

---

[189] N Apergis *et al* 'On the Causal Dynamics between Emissions, Nuclear Energy, Renewable Energy, and Economic Growth' (2010) 69 *Ecological Economics* 2255; H Rogner 'Nuclear Power and Sustainable Development' (2010) 64 *Journal of International Affairs* 137-138, ('Continuing improvements in nuclear power technologies will have much to offer to those who choose to use them. While contemporary societies may feel apprehensive about the use of nuclear power and, in many instances can do without, it is imprudent to eliminate the nuclear option for future generations. Future societies may well opt to stay away from nuclear power.'); contrast A Verbruggen 'Renewable and Nuclear Power: A Common Future?' (2008) 36 *Energy Policy* 4036, 4042.

[190] Verbruggen, ibid 4040 and 4042 (arguing that the nuclear advocates are exploiting climate change to advance nuclear interests, but it remains part of the "business-as-usual" scenario and that nuclear is not advisable as backstop supply relative to renewables); see also Adamantiades & Kessides (note 187 above) 5150.

[191] Verbruggen, ibid 4041.

differentials in the political economy of each country. Pappas *et al* in this respect conclude that:

> [t]he comparison between nuclear and renewable energy technologies cannot bring forth an actual "winner". Each technology has its advantages and disadvantages. In the end, the adoption of a nuclear or renewable energy technology is largely dependent on a country's energy needs and policy, its political decisions, the pressure of public opinion and its economic situation and priorities.[192]

A lesson unlearnt regarding nuclear, and given the responses to the barriers to renewable energy analysed in this Chapter 3, is that South Africa appears willing to incur unnecessary debt in pursuit of nuclear. The Pebble Bed Nuclear Reactor cost the country a fortune and produced no tangible results before being abandoned.[193]

The persistence of a piecemeal approach to legal reforms exacerbates institutional misalignment jeopardising the success of the renewable energy procurement programme. The economic and market based incentives discussed in this Chapter 6 (6.2.1 above) require a shift towards a sustainable energy system in which both the state owned utility and IPPs are able to generate and sell energy at sustainable prices, whilst concurrently promoting access to affordable and reliable energy. Veljanovski points out that this includes a shift from the largely command and control mode of regulation:

> [c]reating markets is the most obvious response to many areas where direct regulation is currently used. This can take the form of creating and enforcing property rights in previously unowned resources and assets. This in turn harnesses the profit motive to prevent over-exploitation and husband natural resources.[194]

---

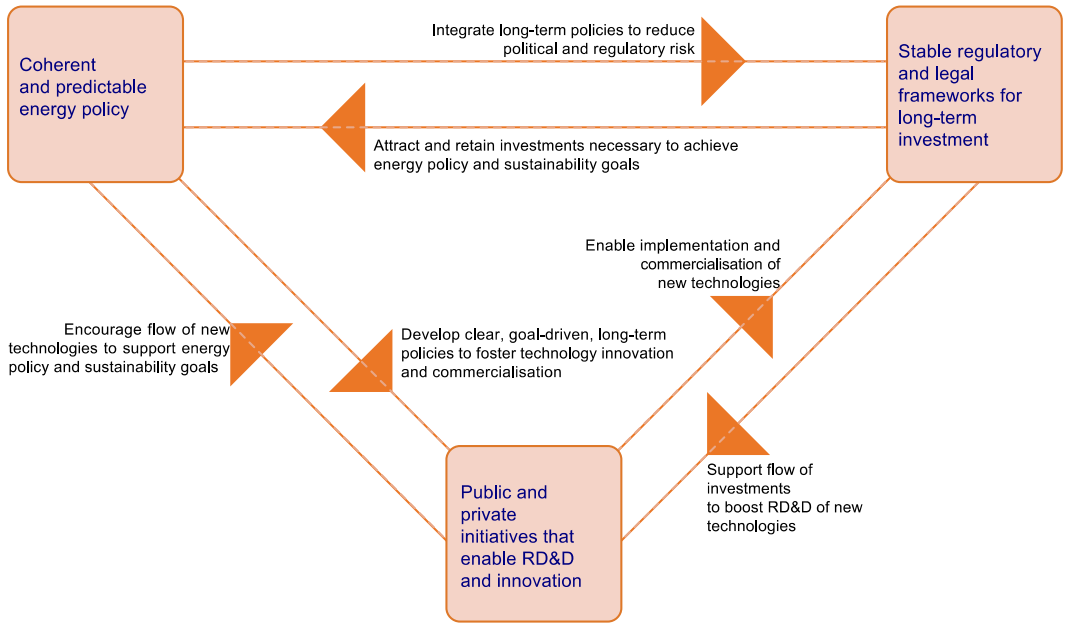
[192] C Pappas *et al* 'A Comparison of Electricity Production Technologies in Terms of Sustainable Development' (2012) 64 *Energy Conversion and Management* 626, 631.
[193] S Thomas 'The Pebble Bed Modular Reactor: An Obituary.' (2011) 39 *Energy Policy*, 2431, 2439; South Africa has recent indicated serious commitment to procure nuclear energy from Russia. See also K Shrader-Frechette *What Will Work: Fighting Climate Change with Renewable Energy, Not Nuclear Power*. (2011) 4 (nuclear is costly and not a solution to climate change).
[194] C Veljanovski 'Economic Approaches to Regulation' in Baldwin R, Cave M, & Lodge M, (eds) *The Oxford Handbook of Regulation* (2010) 17, 30.

The World Energy Council has, for the past three years, highlighted that the big energy questions are security, equity, and environmental sustainability and they developed a model to show how to tackle these. It notes that 'an 'energy gap' remains, with many people lacking access to energy and a deficit between current energy use and what is sustainable in terms of energy security, affordability or environmental impact.'[195] Getting to a sustainable energy system requires a country and its energy regulators to balance and resolve the energy 'trilemma'.[196] This is well illustrated by the World Energy Council in the diagram of the *Energy Trilemma* below **(Figure 4):**

[195] World Energy Council (WEC) 'World Energy Trilemma: Time to Get Real - The Agenda for Change' (2013) 3.
[196] Ibid 4.

Figure 4 Source: Adapted from Figure 13, in *World Energy Trilemma: Time to get real – the case for sustainable energy policy*, World Energy Council (2012) p35.

Three key interconnected policy areas are necessary to support the transition to sustainable energy



This illustration unequivocally highlights that stable regulatory and legal frameworks are a sine qua non for investors to promote renewable energy in the long-term. In addition, to stability, it is also clear that the legal framework must provide certainty and policy coherence. The question is therefore, does South Africa have such a legal and policy framework in place? Chapters 3 to 5 have shown that this is not quite in place, and Chapter 6 has demonstrates that the legal and policy mechanisms to promote renewable energy have not yet adequately developed into a coherent legal framework. Certainly, the National Development Plan's energy objectives and the IRP 2 are aligned to a degree, but beyond these two policies, the actual energy laws (especially the ERA and National Energy Act) remain lagging behind technological developments and where South Africa is with procuring renewable energy. There are thus clearly

lessons still to be learnt and applied in improving the energy governance framework to enable a shift towards renewable energy sources.

Illustrative references to what Germany did with FITs showed that the shift towards an auction bidding system to procure renewables may not work well in South Africa in the long-run, given the lack of subsidies for renewables. IPPs buying into renewable projects may struggle in the long-term to sustain the prices they offered. The continuing fossil subsidies provided to Eskom and conventional energy industry compounds this.

6.5. Conclusion

Lack of corporative governance and policy discordance remains a challenge that can hamper the effectiveness of the responses to remove obstacles to renewable energy. These feed into lingering policy uncertainty that is making investors and the private sector proceed with caution. The mixed reactions from stakeholders towards the carbon tax and the REIPPPP as well as the delayed ISMO Bill mirror this lack regulatory of coherence. There is a need for researches, civil society, and experts to ensure that proposed strategies are relevant, reliable, and sustainable in the socio-economic environment of South Africa. A number of reports by civil society organisations seem far removed from reality in terms of what South Africa can financially and socially bear – internationally appealing but unsustainable solutions. Some of the ineffective responses discussed in this Chapter are evidence of such strategies.

Recent developments do indicate that despite this situation, South Africa has been able to take small steps towards enabling the entrance into the energy industry by IPPs through the REIPPPP. South Africa has attracted the most investment into renewable energy over the past two years due to this semblance of vision and planning. Nevertheless, the failure to leverage the power of legal regulation to, firstly remove obstacles and secondly, implement the economic instruments and other responses above is delaying progress.

Demand side management and energy efficiency measures have currently played a secondary role to supply side interventions. This is despite

evidence that these demand side strategies are critical to reducing the need for more capacity and for raising awareness among consumers on sustainable energy choices. This indirectly enables legal regulation (e.g. electricity levy, energy efficiency allowance and deductions) to start to address social and economic behavioural barriers.

Chapter 7
The Future of Renewable Energy in South Africa

7. Introduction

> 'The transition from conventional energy to renewable energy is a no-brainer. If we stick doggedly with fossil fuels, we lose. If we try to wait until they run out, and continue to simply tinker with renewables, we lose. Only by getting our most basic need right, by transitioning to using energy sources that are free, limitless, and are environmentally, socially and geopolitically benign can we win-win-win. To continue down the present path, with much talk and little action, while climate is pushed closer every minute to a catastrophic tipping point, is nothing short of a crime against present and especially future generations.'[1]

This study has sought to establish the major obstacles to renewable energy in South Africa and to elaborate on the implications of existing energy and environmental laws on the country's ability to develop an effective renewable energy legal framework. The purpose of this thesis was to investigate the potential role of law and regulation in promoting the increased use of renewable energy in South Africa in the face of energy insecurity and persistent challenges with reliability. The entrenchment of fossil fuels created a regulatory environment that does not adequately promote renewable sources. In addition to incoherent renewable energy interventions, the study also found the misalignment between energy and environmental law to be one of the legal, but not exclusive, impediments to the use of renewable energy in South Africa.

This desired shift towards sustainability appears at loggerheads with the increasing demand for affordable energy, which happens to be practically obtainable only from conventional sources. The social, economic, and political environment in South Africa is such that energy has become inextricably entwined with the developmental state agenda on economic development, poverty alleviation, and job creation. These contradictions and conflicting priorities are glaring in the National Development Plan whose objectives aim to please everyone but may eventually please none.

The primary research question investigated by this study was to what extent does South African energy and environmental laws promote the

[1] M Mendonca *Feed-in Tariffs: Accelerating the Deployment of Renewable Energy* (2007), XX.

development, use, and deployment of renewable energy and how could these laws be reformed where they are deficient? In this concluding Chapter, I summarise the findings of the study, make conclusions on how energy and environmental law can enable South Africa to gradually transition to an energy mix where renewables play a bigger role. I further provide insights into how current and proposed policies towards a low carbon economy are areas for implementing the tools discussed in Chapter 6 and evaluate the effectiveness of the measures use to promote renewables to date. The national gravitation towards a low carbon economy, which I outline here, should further catalyse the practical implementation of sustainable development in the energy context.

7.1. Summary of insights

In order to promote the use of renewable energy in South Africa's energy mix, a number of key legislative and governance reforms must be implemented as demonstrated in this study.

Firstly, this thesis in Chapters 1 and 2 demonstrated that the inextricable connection between the use of fossil fuels and South Africa's current energy intensive economic model should be broken down if renewables are to enter the energy market. There are domestic and international reasons why it has become necessary to use regulation through law to create a regulatory environment in which renewables can compete with fossil fuels as sources of electricity. This thesis found that at a theoretical level the effectiveness of regulation is impacted negatively by the Constitutional design of the levels of government, energy laws that entrench fossils, and environmental laws that are inadequately used to support renewable energy, incoherent renewable energy policies, and insufficient support for private sector energy companies. However, promoting regulatory coherence will act as a trigger for measures aimed at other social, economic, and political barriers to renewable energy sources.

Secondly, Chapter 4 explained the complex challenge of balancing international obligations to address climate change, the major source of GHGs being the energy industry, and the need to promote access to affordable, reliable and secure energy for all. The energy policy framework is premised on

sound policy, yet the hard laws remain pro-fossil fuels. Further, the implementation of the renewable energy and environmental policy does not reflect the stated objectives of both law and policy. Governance problems ranging from institutional tensions, poor service delivery and lack of cooperative governance impede implementation of environmental laws that could promote renewable energy. The thesis confirmed that while there is room within existing energy and environmental laws to promote renewable energy; the mandate is not obligatory and the administrators are left to decide what energy sources better promote South Africa's socio-economic goals and energy security priorities.

The emergence of a Climate Change White Paper and increased reliance on integrated energy resource planning provide hope that going forward, the country will create an enabling environment for renewable energy. Furthermore, the study has argued that climate change provides a space to integrate energy and environmental law. This is already evident in the REIPPPP. The benefits of the One Environmental System should extend beyond mining and environmental regulation to encompass fields like energy law, and town and country planning laws. As argued in Chapter 4, the system currently deals with the effects environmental impacts of mining, without addressing the question of energy sources and pollution control from energy processes.

Constitutional environmental rights and the climate related imperatives indicate environmental law as a key enabler of renewable energy in South Africa. Regulation of environmental impacts of development activities (including energy projects), pollution control provisions (air and water pollution) as well as land use planning could be more rigorously used to steer the energy industry away from fossil fuels towards renewable sources. Chapter 5 illustrated that natural resource governance depends on the environmental law architecture and effective implementation. However, without directed measures towards using environmental regulatory mechanisms to promote renewables, environmental law will not play this vital role. Thus, the study found environmental law, as currently designed, can in fact legitimatise and fossil

fuels. The principles of environmental management can be used in the energy law context to promote renewables but the fragmentation between energy and environmental law prevents these principles from having that effect.

The thesis further found that addressing the juridical challenges preventing renewables from becoming a big part of South Africa's energy mix are only a first step towards creating an enabling environment. Renewables face other barriers elaborated on in Chapter 3. The thesis argued that addressing the legal framework problem could unlock several of these barriers especially those that require regulatory enabling for them to function. Economic incentives, for instance, can best be implemented where there are laws mandating them. Energy efficiency can only function and achieve results with appropriate enabling legal regulations.

Similarly, full–cost accounting, subsidisation and structural barriers are fit for regulation through law. Institutional fragmentation and lack of political will may be dealt if there are appropriate laws limiting discretion and providing guidance on what energy sources should be promoted by regulators. The study also found that beyond these barriers, there are social, behavioural and ethical challenges that should be dealt with by tools beyond law.

Raising awareness around climate change, energy efficiency and environmental impacts of fossil fuels can happen without legal intervention. The energy culture in a country cannot be changed overnight through law and policy, given the dynamism of culture. Nevertheless, even then, signals sent through legal reforms can in the long-term influence the energy culture in the country. In summary, Chapters 5 and 6 demonstrated that a sustainable shift to renewable energy sources is possible without crippling the economy or energy security. However, the transition to renewable energy can only be progressive given the implications for economic and energy security. It cannot happen overnight. Fossil fuels established their dominance over centuries of research and development.

At the global level, several regulatory responses have been developed to deal with barriers to renewable energy, including strategies that address the lack of an appropriate legal framework. However, not all renewables support

mechanisms will work in South Africa' social, economic and regulatory environment. Some of these strategies such as FITs, energy efficiency, integrated energy planning, fiscal incentives and fiscal environmental measures and demand side management have all been a part of the suite of measures that South Africa has tried to use. Through an evolving process of finding appropriate measures to promote renewable energy, South Africa ultimately implemented the REIPPPP. The programme has seen substantial amounts of energy being generated from renewables at competitive pricing. The framework for the REIPPPP has seen record investment flows into the renewables sector[2] and it is to date most serious indicator of the potential of renewables in South Africa.

The thesis, however, also insists that unless the policy positions underlying the white papers and ambiguous market incentives in different regulatory instruments are consolidated into a coherent law on renewable energy progress will be limited. Institutional integration and effective governance can lead to effective implementation of energy and environmental laws embedded in sustainability. Perhaps this can also steer political will towards a sustainable energy system.

7.2. The social, economic, and cultural context of recommendations

The socio-economic dynamics of South Africa clearly are impinging on the government's ability to move towards renewable energy. The demand for access to energy is shaped by a history of denial, marginalisation, and outright discrimination in the provision of energy services among other services during apartheid. This historical injustice has punctuated legal and policy developments influenced by restoration and redistribution. Social and economic poverty is a real constraint on the state's ability to make futuristic policies and

[2] South Africa attracted US$4.9 billion in 2013, US$5.7 billion in 2012' in renewable energy investments under the REIPPPP: 'Keynote Address by the Honourable Minister of Energy, Ms Tina Joemat-Pettersson at the Renewable Energy Conference' 30 October 2014; see also Department of Energy, Renewable Energy IPP Procurement Programme: Bid Window 3 Preferred Bidders' Announcement.' (2013).

laws that may entail expensive institutional and technological reforms. The South African energy poverty, socio-economic rights, affordability and environmental sustainability complex mirrors the global trilemma of how exactly do we balance access to affordable energy, environmental sustainability (renewable energy) and energy security.

The study has demonstrated that through appropriate legal reforms renewable energy could assist South Africa to navigate this complexity, but it also argued that energy from conventional sources would remain relevant to South Africa for some time. The NDP does provide some future visioning of how this is to happen but areas of uncertainty and regulatory tensions remain. A rethinking of how law is used as a regulatory tool is necessary. The thesis argued that regulation must move to a modern nuanced understanding of regulation as encompassing more than just centralised commanding and controlling by state agencies. A shift to incentive based regulation can facilitate the creation of an energy market and thereafter sustain such a market for renewable energy.

A reinvention of the role of law in regulation entails increased use of other approaches to regulation especially the use of market-based instruments. However, even such modern instruments must be conceived of and designed in the context of a country's social, economic environment and institutional dynamics. Market based instruments can work where there are functioning markets but they are certain to fail in an environment of poverty and underdevelopment where the state is the key provider of energy services.

7.3. Reinventing the role of law in energy regulation

Law historically has caused revolutions and sometimes revolutions have generated laws for the future. The relationship between law and economics is quite an intriguing one. While the economic relations of production can give us certain types of laws and shape the content and ideological basis of such laws, once in place, the law itself can react on and shape the economic and social relations of productions for good or worse. In the energy industry, this study

indicates that the role of law depends on who is designing and implementing the laws. Thus, energy laws brought about by the industrial revolution and the discovery of coal and oil are unique to an energy industry dominated by these sources. Such laws cannot be used to promote other sources of energy. In order for law to change its role, new law has to be developed and old law has to be jettisoned.

The support for conventional and fossil fuels given by existing energy law distorts the potential role of renewables. To the extent that law is part of the market and these distortions, law has to internally change. The relationship between law and renewable energy remains complicated. Law is dynamic and responds to the social and economic imperatives of the time. It 'contains both norms guiding behaviour and institutions for evaluating and judging behaviour. The evaluation is based on the very same norms which guide behaviour'[3] However, '[l]aw has limits and that is why we can refer to legal systems and to legal rights and duties which are not necessarily moral rights and duties etc.'[4]

The ethical and behavioural barriers discussed in Chapter 3 call for social interventions to raise awareness of energy choices and enable people to change their attitude on energy consumption. Law has direct rule-based[5] and indirect functions, which are fulfilled not only by the mere existence and application of the law 'but also of their [law] interaction with other factors such as people's attitudes to the law and existence in the society concerned of other social norms and institutions.'[6]

Chapter 4 and 5 demonstrated that energy laws that developed to regulate, legitimatise, and enable fossil fuels will not serve the same purpose in low-carbon green economy founded on renewable energy dominated energy supply. In this respect, law has to reinvent itself into a modern law championing sustainable energy. This reinvention is already happening in many jurisdictions including South Africa where policies specifically focused on renewable energy

---

[3] J Raz *The Authority of Law: Essays on Law and Morality* (1979) 112.
[4] Ibid 115.
[5] LL Fuller *The Morality of Law* Vol. 152 revised ed. (1969) 106.
[6] Raz (note 3 above) 168.

sources and implementation strategies are being developed.[7] The success of solar and wind energy projects in Europe (e.g. in Germany) and solar and wind in China are driven by concomitant reinvention of the legal regulatory instruments. It is clearly impossible for archaic law to promote new technologies. Gerard concurs that 'existing economic and legal mechanisms as well as physical constraints significantly inhibit the growth of renewable energy resources'[8]

The key question underlying this study was how law goes through this reinvention process. Energy law, environmental law (and associated natural resources field such as land and property law, planning laws and taxation laws) together have to grow and become enablers of – not obstacles to – renewable energy technologies. This study focused on energy and environmental laws as the direct and immediate legal spaces where this reinvention can take place. This can then be replicated in other cognate fields and the whole legal system.

The lack of political will has been shown to be behind some of the delays in the transition to renewable energy. This is at the level both of government but also resistance from the established industry. Outka concludes rightly that:

> [p]olitically powerful groups invested in status quo regimes resist transition, thrive on the effect of lagging law, and employ strategic delay to their advantage – a tactic that electric utilities have deployed particularly effectively. These contextual features have the effect of encouraging slow, additive evolution of law over legal transitions that mark significant departures from existing frameworks.[9]

In South Africa, the government has shown some commitment to supporting renewable energy, yet commentators noted in this study argue that this can be improved.

---

[7] The Renewables White, Climate Change White Paper and National Energy Act are such recent policies and laws aimed to elevated renewable sources in South Africa's energy mix. While there is no specific law on renewable energy the scattered provisions and piecemeal amendments to energy laws have enabled the country to begin to mainstream renewables into the energy mix.

[8] MB Gerrard 'Introduction and Overview' in MB Gerrard (ed) *The Law of Clean Energy, Efficiency and Renewables* (2011) 13.

[9] U Outka 'Environmental Law and Fossil Fuels: Barriers to Renewable Energy' (2012) 65 *Vanderbilt LR* 1679, 1684-1685.

A major obstacle to the transition to renewable energy are the existing energy companies that feel threatened by the opening up of the energy market to the private sector. In this respect while Eskom proclaims that it supports renewables, its actions shows a holding-on to the energy system and a willingness to cooperate with IPPs mostly when their supply assists Eskom to maintain a good margin of supply and avoid interruption of supply. The vertical integration of the state monopoly is a major barrier to entry, contracting, price determination, and energy market dynamics. Hence, it has been argued that whether through FITs or a bidding system, the renewable electricity drive may not succeed to the extent that ESKOM retains a key role as owner of the transmission systems and the single buyer of electricity from private generators.

Energy law must be reinvented to dismantle the institution of a state monopoly and enable the private sector (IPPs) to play a role in producing energy. South Africa had begun this process with the Independent System Operators (ISMO) Bill, bit sadly abandoned the process in favour of the status quo. The National Energy Act seeks to spearhead the diversification of energy sources. However, these legal reforms have taken years to come to fruition. Is it possible that this reinvention of energy law is taking place in another scope – through the new sustainability language of green economy, low-carbon economy spaces? How does this language support a transition towards sustainable development anchored on renewable energy? The International Energy Agency has commented that:

> [i]n the context of green growth, policies that support renewables serve two objectives. First, they aim to create new markets that recognise the importance of natural capital and of reconciling limited natural resources with economic growth. Second, they provide an exit strategy from the fossil energy based development path to which the global economy is currently committed.[10]

This provides a framework to sum up this study and propose what has to be done if South Africa is to use law an instrument of regulation to promote renewable energy. The transition to a green low carbon economy must occur

[10] O Muller *et al* 'Renewable Energy: Policy Considerations for Deploying Renewables' OECD/IEA 2011, 14.

within the constitutional ethos and aspirations of promoting justifiable socio-economic development without unnecessarily destroying the environment.

The coupling of economic growth to unsustainable production and consumption has remained ever more secure and any attempts to frame sustainability in the language of the economy are bound to be futile. Economic growth must be decoupled from unsustainable use of natural resources especially heavy reliance on fossil sources of energy, which at the centre of this growth.[11]

The reinvention of the role of law discussed here can be implemented through specific legal reforms to create an environment that supports growth of renewable energy. The key recommendation discussed further in 7.4 is that even with a targeted renewable energy law, other areas of the legal system must be reformed to align and ensure implementation of a renewable energy law. This is informed by the key findings from this thesis summarised above.

The study was premised on the hypothesis that one way to promote renewable energy is through legal intervention, focusing on energy, environmental and mining laws. Certainly, the problem implicates the legal system and natural resources governance broadly, but these are key to unlocking the potential of renewables. Environmental governance has improved vastly since the time fragmentation was identified as a key obstacle to effective environmental regulation. However, the major premise of this thesis is that the reforms in environmental law have not, as much as they could, influenced the development of energy law towards renewable energy.

The legal reforms that have culminated in the recent One Environmental System[12] can be replicated beyond the 'environmental' system to encompass key sectors such as energy that are intricately intertwined with natural resources governance. Although South Africa's energy laws are modern in the sense of being largely enacted after the NEMA and the entrenchment of

---

[11] M Fischer-Kowalski & M Swilling 'Decoupling: Natural Resource Use and Environmental Impacts from Economic Growth.' (2011) 4.

[12] Discussed in Chapter 3 and in detail by T Humby 'One Environmental System: Aligning the Laws on the Environmental Management of Mining in South Africa' (2015) 33(2) *Journal of Energy & Natural Resources Law* 110.

sustainable development, the laws have remained technical and incapable, by themselves, of promoting the increased use of renewable energy sources. This was demonstrated in Chapter 4 and 6. There is no directed effort for pollution control to deal with coal as a major source of GHGs – in fact there is very little direct regulation of GHG and their sources and processes that generate them, namely the energy production processes. This is the linchpin of the argument in Chapter 5 that environmental law has not done enough to discourage fossil fuels or promote renewable energy, which it should.

The governance of energy remains institutionally fragmented, thus the NERSA and Nuclear Regulator both function quite autonomously of environmental regulators, yet decision made by energy regulators have serious implications for air and water pollution.[13] Indeed the environmental authorisation processes and other permitting processes can still be brought to bear on energy activities. That they occur outside of an integrated legal framework is a problem. This problem is comparable to how environmental management of mining activities used to be problematic before the One Environmental System.[14] One is aware that the entire legal system is problematic to the extent that it does not provide key aspects that can enable renewable energy. This includes aspects relating to property rights, servitude, access to the sun, wind and solar installations and housing and building regulations as well as procurement laws and trade and competition regulation and the question of renewable energy subsidies and incentives. Clearly the challenge posed by these systemic challenges is bigger than the purpose of this study and could be subject of further focused research.

This study has also demonstrated how climate change and South Africa's contribution to GHG emissions are among the key drivers of renewable energy and green economy overtures. The Climate Change White Paper is part of the strategy to address green economy issues from a climate change perspective.

[13] For instance, decision on whether or not to issue an electricity generation licensed are not sufficiently influenced by environmental sustainability factors (source type, pollution expected and mitigation thereof), rather being heavily influenced by economic and business factors. See detailed elaboration in Chapter 3.
[14] Discussed in Chapter 2.

The REIPPPP is one of the strategies envisaged to play a significant role in the white paper. However, it is questionable whether the Climate Change White Paper adequately integrates the policy on climate change responses across sectors. Given the cross cutting nature of climate change, it present an opportunity to integrate energy and environmental policies towards the objective of securing a reduction of GHGs from the energy industry.

The basis of the Climate Change White Paper is a departure from a business-as-usual approach to climate change response, yet there is still an undertone of protecting the economic development, jobs, and the energy industry status quo. This should be read together with continued faith in fossil fuels for the near future, at least to 2030.[15] Technology transfer under international climate change treaties must translate from paper promises to practical steps taken by the developed economies. However, since the Rio Earth Summit of 1992 and the treaties resulting from that Summit that placed much faith in technology transfer, nothing significant has materialised. If anything, the stalled climate change negotiations are an indication that some of the implementing mechanisms are faced with certain failure. Technology transfer is a critical strategy for ensuring that developed economies can assist developing economies to meet their transition to low-carbon economies, including by building capacity in the development of renewable energy technologies.

As demonstrated in Chapter 6 (6.3.2) climate change provides an ideal place to launch more renewables in South Africa. This so because the Climate Change White Paper embeds key environmental management principles that are lacking in energy law, namely the precautionary principle, sustainable development and the polluter pays principle, among other principles. This mainstreaming of the principles that are so lacking in energy laws may allow such laws to become tools to promote renewable energy.

---

[15] IRP2 and Scenario Building Team 2007, Long Term Mitigation Scenarios: Scenario Document, Department of Environment Affairs and Tourism, Pretoria, October 2007 (LTMS) < http://www.erc.uct.ac.za/Research/publications/07Scenario_team-LTMS_Scenarios.pdf >

7.4. Recommendations: *A comprehensive renewable energy framework*

This study has demonstrated that South Africa is confronted by serious energy security challenges both in terms of supply and demand as well as reliability and affordability. The national and international imperatives towards increased use of renewables are undeniable. In this part the study presents what can be done to ensure that the barriers discussed in Chapter 3 are ameliorated and that the laws discussed in Chapter 4 and 5 can play an effective enabling role for renewable energy. To this end comprehensive and systemic recommendations are proposed that could at once ensure existing laws and the legal system facilitated the functioning of laws and tools directly aimed at promoting renewables. These include aligning pollution control and land use planning legislation to energy laws and ensuring effective governance and departmental coordination to remove poor governance that has impeded renewables and effective implementation of existing energy laws. There are also recommendations on specific legal instruments that have not been sufficiently used in South Africa to support renewable energy.

Recommendation 1: *Regulatory coherence and alignment*

The legal implementation of South Africa's energy and environmental laws must be coherent and consistent with initiatives by National Treasury. The drive towards renewables, while continuing with building coal and nuclear powered plants must be reviewed. This can partly be remedied, at the national institutional level, by the regulatory integration of energy, environment, and natural resources legal frameworks. Apart from legal integration and the synchronisation of norms and standards, it is submitted that the government must seriously consider the creation of a regulatory agency responsible for renewable energy. Such an agency would provide a platform for effective implementation of the scattered potential tools to promote renewable energy regardless of parent ministry mandates.

The One Environmental System is encouraging but the proposed arrangements may falter under the shadow of the silos of government departments for separate aspects of natural resources (including energy resources) and the environment. For an effective transition to renewable energy the Departments of Environmental Affairs, Energy, Public Enterprises, NERSA, and National Treasury have to work much closer together to ensure policy and implementation coherence. A central agency could bring cohesion by playing a role encouraging the overarching formulation and implementation of policy. Some countries have created specific ministries of renewable energy or ministries that have a huge mandate on renewable energy that has made a difference in terms of the effective implementation of renewable energy law and policy.[16]

Recommendation 2: *Institutional (re)design*

Institutional integration[17] can enable effective implementation of existing laws that have potential to promote renewable energy. Institutional integration can be aided through avoidance of unnecessary delays in the finalisation of critical path legal reforms such as the ISMO Bill, the Draft Integrated Energy Plan, and the Renewable Energy and Climate Change White Papers. Law and policy making stagnation can be crippling to sectors and actors that are waiting for signals from such processes. Similarly, institutional delays among levels of government can delay action by provincial or municipal government to implement local level renewable energy procurement.

In addition, it is recommended that the ERA be overhauled to align it to the objectives of the National Energy Act and ensure in turn that all the energy legislation is informed by the NEMA environmental management principles. The

[16] See for instance India (*Ministry of New and Renewable Energy*) < http://www.mnre.gov.in>; Denmark (*Ministry of Climate,* Energy *and Building)* < http://www.efkm.dk/en>

[17] Defined by J Glazewski & L du Toit (eds) *Environmental Law in South Africa* Service Issue 2 (2014) at 20-25, In this instance Departments such as Mineral Resources, Water and Sanitation, Environmental Affairs, National Treasury, and Energy must coordinate their norms and standards, principles as well as their implementation. This would enable environmental law to properly function as a check on energy source choices for example.

powers of NERSA in terms of energy legislation must be reviewed to enable this institution to take decisive action on types of primary energy sources. This includes the power to use the tariff principle in s 14 ERA to influence industry direction. Fundamental sustainability assessment procedures in environmental legislation such as EIA can be effective in promoting renewable energy if mainstreamed into energy law.[18] However, alignment with environment law requires, as a prerequisite, updating of energy law itself to disentangle it from its entwinement with non-renewable energy sources.

Recommendation 3: *Reforming existing environmental and energy legislation*

Environmental laws that affect the implementation of renewable energy projects must be effectively enforced and implemented. Similarly, existing energy laws should be reformed to include provisions that mandate renewable energy. The principles of environmental management in s2 of the NEMA should explicitly be incorporated into energy legislation such as the Electricity Regulation Act, National Energy Act, Nuclear Energy Act and the Gas Act. This recommended alignment should ideally transcend the NEMA and permeate the specific environmental management statutes like the National Water Act (hydro power and water pollution control), Biodiversity and Protected Areas legislation (to prevent mining of energy minerals in environmentally sensitive areas). The National Energy Act and the Electricity Regulation Act should be amended to align with the Air Quality Act and the norms and standards, and atmospheric emissions control regulations to enable the development of emission standards that are stringent but capable of being complied with in South Africa. Environmental pollution taxes,[19] implemented through, *inter alia*, carbon tax,[20] fossil fuel levies, negative incentives, use charges and a simple environmental

[18] RL Ottinger & M Jayne 'Global Climate Change Kyoto Protocol Implementation: Legal Frameworks for Implementing Clean Energy Solutions.' (2000) 18 *Pace Environmental Law Review* 19, 50 (EIA as tool).
[19] Ibid, 44 (but politically sensitive given energy intensive nature of SA economy).
[20] Detailed study of the proposed carbon tax is beyond the scope of this thesis but it is an area worth further research to evaluate its potential effectiveness as a measure to promote energy efficiency (disincentive) and reduce GHG emissions.

levy[21] discussed in Recommendation 4 must be integrated into environmental and energy laws as necessary. This could be done through the authorisations, permitting or licensing provisions in energy and environmental legislation so that past and present conduct is taken into account in considering application for electricity generation licences.

The Air Quality Act represents a promising area within which to control and gradually reduce GHG emissions from the energy industry, a point expounded in Chapter 5. Stricter technology and air quality standards[22] can make it costly to burn coal. To successfully implement such standards, there must be close collaboration between the Departments of Energy, Water and Environmental Affairs, Mineral Resources regarding the authorisation, licensing of, and enforcement against energy companies. The collaboration must occur through a recommended enhanced cooperative governance model that, not only emphasises conflict resolution, but also enables joint planning and implementation of laws and regulations.

Energy efficiency and demand side management strategies currently used in South Africa are not achieving sufficient demand reductions. The National Energy Act, which established SANEDI, provides a framework to implement an aggressive efficiency programme. The provisions and programmes being implemented must be reviewed to increase their effectiveness. Part of this includes extensive awareness campaigns that are constant, and not driven by crises like Eskom's TV alerts.

Heightened awareness of the advantages of renewable energy is necessary to enable consumers to make the right choices when the opportunity to make such choices is provided. However, as noted in this study as long as Eskom as the single buyer of electricity produced by IPPs, there is very little room for consumer choice unless consumers have sufficient capital to implement their own self-standing renewable energy installations.

---

[21] Environmental fuel levies have been in place for liquid fuels but the electricity levy has not had the intended effect. There is therefore a need to reconsider the design and implementation of appropriate and explicitly referenced environmental/pollution levies in the use of electricity.
[22] Ottinger & Jayne (note 18 above) 49-50

Recommendation 4: *Better use of market instruments to promote renewable energy*

To cultivate a market in renewable energy, it is important for the government to provide an economic environment where market based economic instruments can achieve their intended objectives of building confidence in the private sectors (IPPs), as well as making renewable energy a defendable business case. The use of such instruments was fully canvassed in Chapter 6. While creating competition by dismantling the monopoly of state owned entities, it is critical for the legal framework to recognise the unique socio-economic imperatives in South Africa by providing safety nets for the poor who may require continued state subsidisation and support to access affordable energy.

This thesis recommends that the government gradually remove direct and indirect fossil fuels subsidies [23] in the form of fiscal support to Eskom, coal mining companies, and nuclear procurement. This will implement full-cost accounting and cost reflective pricing of electricity at once addressing the question of competition.

NERSA should be enabled through appropriate amendments to the Electricity Regulation Act (ERA) and the National Energy Act to use its licensing function to promote renewable energy by setting competitive tariffs. Similarly, nuclear energy legislation must also be amended to enable the NERSA to set tariffs and generation conditions that ensure competitiveness of renewables as against nuclear energy.

Customs and excise rebates for renewable technology[24] and higher duty for fossil fuel technologies must gradually be introduced by National Treasury and South African Revenue Authority (SARS). These recommendations must be implemented bearing in mind the unique social and economic circumstances of South Africa. As discussed in Chapter 6 these tools must be properly designed to respond to the South African local context. This may mean cross-

[23] Ibid 41- 42 and 61. (China, India, Poland, Brazil, UK all ramped up renewable energy through progressive reduction of fossil subsidies over time.)
[24] Ibid 45-46 (reporting how Denmark enabled wind power through technology incentives including R& D.)

subsidisation among energy consumers and graduated user rates that ensure heavy users pay more than basic consumers.

Recommendation 5: *Better use of energy planning tools in existing legislation*

The thesis found that integrated energy resources planning in important to support the growth of renewables. It is recommended that better use be made of energy planning tools provided for in the ERA, National Energy Act and cognate environmental natural resource planning tools. This can lead to the development of plans that provide long-term certainty. This is critical for sustainable investment flows into the renewable energy sector. The uncertainty created by the shift from FITs to the REIPPPP and the sudden attention to the nuclear programme can cause hiccups in the investment community that impact negatively on renewable energy uptake. The government must stay true to the targets and scenarios in the IRP 2 and the White Papers broad policy trajectories, avoiding sudden policy shifts.

Part of this better planning includes updated planning instruments as required by legislation. The IRP2 was last officially updated in 2010. A November 2013 update remains in draft form three years later. Similarly, the Integrated Energy Plan (IEP) draft produced in 2012 remains a draft. These planning documents can enable the procurer of energy (itself an uncertainty as sometimes it is the Department of Energy and in other Eskom) to give clear long-term market signals. The nuclear, coal, and gas base load IPP procurement processes in terms of the ERA New Generation Capacity Regulation to not inspire confidence on the long-term sustainability of renewable energy projects in which IPPs have sunk a lot of costs.

Another recommended way to ensure legal and policy certainty is to transform the policy documents into binding legal enactments – where necessary – on the country's vision of the future energy mix. The National Energy Act did not sufficiently implement all the policy objectives in the Renewables White Paper. As the situation stands it is not quite possible to predict with certainty where South Africa is going in terms of its medium to long-term energy mix. There are indications in the IRP 2 but these are now out-dated

without any cabinet approved IRP update. Contradictory policy pronouncement, (such as accompanied the debate on shale gas, coal, water, climate change, and renewables) by the presidency, energy department, and environmental department should be avoided through a proper inter-departmental coordination.

Recommendation 6: *A comprehensive Renewable Energy law – essential features*

Recommendations 1 to 5, if implemented, could enable renewable energy in the electricity sector of South Africa as already illustrated by the relative success of the REIPPPP. However, the barriers discussed in Chapter 3 and the strategic analysed in Chapter 6 may still require dedicated renewable energy legislation to make them effective. The enactment of a dedicated comprehensive renewable energy law is premised on the fact that existing energy, environmental, land use planning and mining laws taken together do not provide a comprehensive renewable energy promoting legal framework. The objective of this existing body of legislation is not to enable renewable energy. Existing energy law is firmly targeted at perpetuating the status quo heavy reliance on fossil fuels. However, some of the recommendations above could very well be key features/aspects of a comprehensive renewable energy law.

First, a renewable energy statute must have as its explicit object the enabling of sustainable and renewable energy taking cognisance of South Africa's socio-economic and energy security context. This object entails the development of clear mandates for a renewable energy agency that must sit outside government but possibly a regulator situated within NERSA. An independent renewable energy agency would show high-level government commitment and provide dedicated leadership.[25]

Second, a key feature of such legislation would be to promote institutional alignment with national, provincial and municipal land use planning, town planning, environmental and energy laws and institutions whose mandates

[25] Along the lines of India's Renewable Energy Development Agency (IREDA).

and activities may present obstacles to renewable energy projects. In this regard, processes such as impact assessment and land rezoning must include express favourable provisions for renewable energy projects. This includes providing for non-grid and non-centralised potential by allowing provincial governments to implement their own renewable energy procurement programmes.

Third, the recommended law must provide for targeted but time-bound government supported incentives to create a level playing and a competitive market for renewables. Appropriate sunset clauses must ensure that once renewable sources become competitive the subsidisation and incentives could be phased out progressively. Subsidisation could be in the form of guaranteed agreements, power purchase agreements (PPA) with Eskom or an independent market operator, FITs, auction system, tax concession for renewable and energy efficiency, and public procurement[26] aimed at promoting use of renewable especially by public entities and incentives for the private sector who take up initiatives to use renewable energy. South Africa must move away from the overemphasis of single instruments approaches and open the possibility of using both feed-in tariffs, auction or bidding systems, energy efficiency rebates, energy conservation rebates and support, co-generation incentives, carbon taxation and emissions trading as well as procurement standards for government institutions. These economic instruments must also be built into the enforcement provisions of renewable energy law.

Fourth and last, given the traction that global climate change is gathering towards a legally binding, nationally driven GHGs reduction targets, renewable energy legislation could benefit from being integrated into any climate change legislation. This latter option is not favoured because by tying renewable energy to climate change it may disable the climate change regime from comprehensively dealing with the many other multifaceted issues that any climate change regime must address. Nevertheless, any renewable energy law

[26] Ottinger & Jayne (note 18 above) 61.

must align with broader climate change governance regime that may come out of the Climate Change White Paper, if any.

7.5. Conclusion

In the here and now South Africa may not be able to technologically and economically displace its heavy reliance on conventional fossil fuels for its energy needs with renewable sources. Nevertheless, beyond doubt it is possible for the country to shift the scales in the energy mix and provide more scope for the inclusion of renewable energy producers in the mix. This study has insightfully illuminated that, without appropriate laws that are coherent, aligned and supported by political will to act – this role envisioned for renewable energy may not be realized soon. Any legal regulation to promote renewable energy must be cognizant of South Africa's peculiar and paradoxical social, economic, and environmental context – in the backdrop of global environmental challenges like climate change.

The desire to promote socio-economic rights and an environment not harmful to health and wellbeing can be both fulfilled by laws that promote renewable, yet accessible, reliable, secure, and affordable energy sources. International imperatives to reduce GHGs that cause climate change and to attract investment in the renewables sector can also be balanced through properly designed legal interventions that are flexible and incentivising to leave space for investors and industry to self-regulate where necessary to enable industrial and development activity. As discussed above, this requires a wholesale rethink of existing policies and laws that entrench fossil fuels, protect established energy monopoly companies, constrain local provincial and municipal action, and stifle private sector innovation and entry into the energy market.

8. BIBLIOGRAPHY

8.1. BOOKS, MONOGRAPHS & BOOK CHAPTERS

Abrahamse W & de Groot J 'The Psychology of Behavior Change: An Overview of Theoretical and Practical Contributions', in Shane F, Peters M, Hoffman SM & Wehrmeyer W (eds) *The Global Challenge of Encouraging Sustainable Living: Opportunities, Barriers, Policy and Practice*. (Edward Elgar Publishing, Cheltenham: 2013).

Assmann D, Laumanns U & Uh D *Renewable Energy: A Global Review of Technologies, Policies and Markets* (Earthscan, Sterling, VA: 2006).

Ayres, I & Braithwaite J *Responsive Regulation: Transcending the Deregulation Debate (Oxford Socio-Legal Studies)* (Oxford University Press, New York 1992).

Baldwin R, Cave M & Lodge M (eds) *The Oxford Handbook of Regulation (*Oxford Handbooks Online, 2010).

Baldwin R, Cave M & Lodge M *Understanding Regulation: Theory, Strategy, and Practice* (Oxford University Press, Oxford: 2011).

Baldwin R, Scott C & Hood C (eds) *A Reader on Regulation. Oxford Readings in Socio-Legal Studies* (Oxford University Press, Oxford & New York: 1998).

Baldwin R 'Regulation: Beyond Command and Control' in Hawkins K (ed) *The Human Face of Law Essays in Honour of Donald Harris* (Clarendon Press: Oxford 1996).

Bartelmus P *Environment, Growth and Development: The Concepts and Strategies of Sustainability* (Routledge: London 1994).

Barton B, Redgwell C, Rønne, A & Zillman, D *Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (Oxford University Press: Oxford 2004).

Barton B, Redgwell C, Rønne A & Zillman DN (eds) *Regulating Energy and Natural Resources (*Oxford University Press, New York: 2006).

Barton B 'Energy Security in the Twenty-First Century' in B Barton *et al Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (2004) 457,459

Bebbington J, Gray R, Hibbit C & Kirk E *Full Cost Accounting: An Agenda for Action*

(Association for Chartered Certified Accountants, London: 2001).

Birol F *World Energy Outlook 2010* (International Energy Agency, 2010).

Bjorn L *World Fossil Fuel Subsidies and Global Carbon Emissions* (World Bank Publications, Washington DC: 1992).

Bodansky D, Brunnée J & Hey E (eds) *The Oxford Handbook of International Environmental Law* (Oxford University Press, Oxford & New York 2007).

Bolwig S & Gibbon P *Emerging Product Carbon Footprint Standards and Schemes and their Possible Trade Impacts* (Danmarks Tekniske Universitet: 2009).

Borchers M, Euston-Brown M & Mahomed L 'Energy Planning in South African Cities' in Droege P *Urban Energy Transition: From Fossil Fuels to Renewable Power* (2011) 564.

Bosselman FP, Rossi J & Weaver JL *Energy, Economics, and the Environment: Cases and Materials, University Casebook Series* (Foundation Press, New York 2000).

Botchway FN *Natural Resource Investment and Africa's Development* (Edward Elgar Publishing, 2011).

Boyle AE & Freestone D (eds) *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford University Press, Oxford & New York 1999).

Bradbrook AJ & Ottinger RL (eds) The Law of Energy for Sustainable Development (Cambridge University Press, Cambridge: 2005).

Brownsword R *Rights, Regulation and the Technological Revolution* (Oxford University Press, Oxford: 2008).

Burdon P (ed) *Exploring Wild Law: The Philosophy of Earth Jurisprudence* (Wakefield Press, Kent Australia: 2011).

Cane P & Tushnet MV (eds) *The Oxford Handbook of Legal Studies* (Oxford University Press, Oxford: 2005).

Cordonier-Segger MC & Khalfan A *Sustainable Development Law: Principles, Practices and Prospects* (Oxford University Press: Oxford 2004).

Cottrell F *Energy & Society: The Relation Between Energy, Social Change, and Economic Development* (AuthorHouse: 2009).

Croley SP *Regulation and Public Interests: The Possibility of Good Regulatory*

Government (Princeton University Press, 2009).

Cullinan C *Earth Jurisprudence: From Colonization to Participation* (State of the World: 2010).

Cullinan C *Wild Law* (SiberInk, Cape Town: 2002).

Shelton D 'Equity' in Bodansky D, Brunnee J & Hey E (eds) *The Oxford Handbook of International Environmental Law* (Oxford University Press, Oxford: 2007) 1080.

Del Guayo I 'Security, Continuity, and Regularity of Energy Supply: The Case of Spain' in Barton B, Redgwell C, Rønne A & Zillman DN *Energy Security: Managing Risk in a Dynamic Legal and Regulatory Environment* (2004) 355, 364-365

Demange LHL 'The Principle of Resilience' (2012) 30 *Pace Env LR* 695-1278.

Droege P *Urban Energy Transition: From Fossil Fuels to Renewable Power* (Elsevier: 2011).

Dryzek J 'Paradigms and Discourses' in Bodansky D, Brunnee J & Hey E (eds) *The Oxford Handbook of International Environmental Law* (Oxford University Press, Oxford: 2007).

Du Plessis W 'Energy Law' in R Blainpain (ed) *International Encyclopaedia of Energy Law* (Kluwer Law International 2006).

Du Plessis W 'Energy Law' in K Deketelaere et al (eds) *International Encyclopaedia of Laws: Energy Law*. Supp. 48 (Kluwer Law International, 2015).

Du Plessis W 'Energy Law and Environmental Protection in South Africa' in Brebbia CA & Sakellaris I (eds) *Energy and the Environment: The Sustainable World* (Wit Pr/Computational Mechanics, 2003) 111.

Eberhard A 'The Political, Economic, Institutional and Legal Dimensions of Electricity Supply Industry Reform In South Africa' (2003) 2.

Eberhard A & Van Horen C *Poverty and Power: Energy and the South African state* (UCT Press, Cape Town 1995).

Eberhard A, Rosnes O, Shkaratan M, & Vennemo H *Africa's Power Infrastructure: Investment, Integration, Efficiency* (World Bank Publications 2011).

Eberhard A *South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons* (World Bank, Washington DC: 2014).

Eberhard A 'Feed in tariff or Auctions? Procuring Renewable Energy Supply in South

Africa.' *Viewpoint: Public Policy for the Private Sector Note (*2013) (338).

Edenhofer O *et al* (eds) *Renewable Energy Sources and Climate Change Mitigation: Special Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge: 2011).

Edenhofer O *et al* (eds) *IPCC, 2014: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge & New York, 2014).

Elliott D *Sustainable Energy: Opportunities and Limitations - Energy, Climate and the Environment Series* (Palgrave Macmillan, Basingstoke: 2007).

Elliott J *An Introduction to Sustainable Development* (Routledge: 2012).

European Renewable Energy Council (EREC), *Renewable Energy in Europe: Markets, Trends and Technologies*. 2nd ed (Earthscan, London: 2010).

Farber DA *Law and Public Choice: A Critical Introduction* (University of Chicago Press, 1991).

Farouk F 'The Green Economy and Sustainable Development in Sub-Saharan Africa' in Netzer N & Althaus J (eds) *Green Economy Turning Over a New Leaf Towards Sustainable Development*? (Friedrich-Ebert-Stiftung, Berlin: 2012) 17.

Feintuck M *The Public Interest in Regulation* (Oxford University Press: Oxford 2004).

Feris L 'Environmental Rights and *Locus Standi'* in Paterson AR & Kotzé LJ (eds) *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (Juta & Co, 2009) 129.

Fischer-Kowalski M & Swilling M *Decoupling: Natural Resource Use and Environmental Impacts from Economic Growth* (Earthprint, United Nations Environment Programme, 2011).

Fräss-Ehrfeld C *Renewable Energy Sources: A Chance to Combat Climate Change*, Climate Change Law, Policy and Practice Series (Kluwer Law International, Alphen aan den Rijn: 2009).

Fuller LL *The Morality of Law* Vol 152 (1969).

Gerrard MB 'Introduction and Overview' in MB Gerrard (ed) *The Law of Clean Energy, Efficiency and Renewables* (American Bar Association, Chicago: 2011).

Gets A *Powering the Future: Renewable Energy Roll-out in South Africa* Prepared for

Greenpeace Africa (2013).

Glazewski J & Du Toit L (eds) *Environmental Law in South Africa* Service Issue 2 (LexisNexis Butterworths, Durban: 2014).

Glazewski J *Environmental Law in South Africa* 2nd ed (LexisNexis, Butterworths Durban: 2005).

Glazewski J 'The Bill of Rights and Environmental Law' in Glazewski J & du Toit L (eds) *Environmental Law in South Africa* Service Issue 2 (LexisNexis 2014).

Goldemberg J *Energy, Environment and Development*. (Earthscan, London: 1996).

Goldemberg J *World Energy Assessment: Energy and the Challenge of Sustainability* (United Nations, 2000).

Goldman DP, McKenna JJ & Murphy LM *Financing Projects that Use Clean-Energy Technologies: An Overview of Barriers and Opportunities* (No.NREL/TP-600-38723). National Renewable Energy Laboratory (NREL), Golden, Co. 2005).

Greenberg S 'Market Liberalisation and Continental Expansion: The Repositioning of Eskom in Post-apartheid South Africa' in McDonald D (ed) *Electric Capitalism: Recolonizing Africa on the Power Grid* (2012)

Haas R et al 'Promoting Electricity From Renewable Energy Sources – Lessons Learned from the EU, United States, and Japan' in FP Sioshansi *Competitive Electricity Markets: Design, Implementation, Performance* (2011) 437.

Haselip JA et al (eds) *Diffusion of Renewable Energy Technologies: Case Studies of Enabling Frameworks in Developing Countries* (Danmarks Tekniske Universitet, Risø Nationallaboratoriet for Bæredygtig Energi, 2011).

Haselip JA 'Fit for Use Everywhere? Assessing Experiences with Renewable Energy Feed-in Tariffs' in Haselip (eds) *Diffusion of Renewable Energy Technologies: Case Studies of Enabling Frameworks in Developing Countries* (Danmarks Tekniske Universitet, Risø Nationallaboratoriet for Bæredygtig Energi, 2011).

Helm D *Energy, the State, and the Market: British Energy Policy since 1979* (Oxford University Press, Oxford: 2004).

Henderson H & Simran S *Ethical Markets: Growing the Green Economy* (Chelsea Green Publishing Co, Vermont: 2006).

Hermann C *The Solar Economy: Renewable Energy for a Sustainable Global Future* (Earthscan, UK: 2012).

Herring H 'The limits to Energy Efficiency: Time to Beat the Rebound Effect' in D Elliott *Sustainable Energy: Opportunities and Limitations* (2007) 135.

Hoffman S & High-Pippert A 'Institutional and Community-based Initiatives in Energy Planning' in S Fudge *et al* (eds) *The Global Challenge of Encouraging Sustainable Living: Opportunities, Barriers, Policy and Practice* (2013) 235.

Holton CJ *What are the Effects of Fossil-Fuel Subsidies on Growth, the Environment, and Inequality?* Dissertation is presented in part fulfilment of the requirement for the completion of an MSc in Applied Economics in the School of Economics, University of Nottingham (2012).

Hope E & Singh B 'Energy Price Increases in Developing Countries' *Policy Research Paper, 1442* (1995).

Hope E *Energy Price Increases in Developing Countries: Case Studies of Colombia, Ghana, Indonesia, Malaysia, Turkey, and Zimbabwe* (World Bank Policy Research Working Paper 1445, 1995).

Houghton JT *et al Climate Change 1995: The Science of Climate Change: Contribution of Working Group, I to the Second Assessment Report of the Intergovernmental Panel on Climate Change*. Vol. 19390 (Cambridge University Press, Cambridge: 1996).

Hutter BM *Compliance: Regulation and Environment* (Clarendon Press, Oxford: 2004).

Hutter BM *The Role of Non-State Actors in Regulation* Centre for Analysis of Risk and Regulation (London School of Economics and Political Science, 2006).

Johansson TB 'The Imperatives of Energy for Sustainable Development' in Bradbrook & Ottinger above, 49.

Johansson TB and Goldemberg J 'The Role of Energy in Sustainable Development: Basic Facts and Issues' *Energy for Sustainable Development: A Policy Agenda*, UNDP, New York (2002).

Raz J *The Authority of Law: Essays on Law and Morality* (1979).

Karekezi S & Ranja T 'Network African Energy Policy Research and Institute Stockholm Environment.' *Renewable Energy Technologies in Africa. African Energy Policy Research Series* (Zed Books, African Energy Policy Research Network (AFREPREN) & the Stockholm Environment Institute (SEI), London: 1997).

Karekezi S & Kithyoma W *Renewable Energy Development* (Energy Initiative, 2003).

Kessides I 'Powering Africa' S Sustainable Development: The Potential Role of Nuclear Energy' (2014) 74 *Energy Policy* S57-S70.

Klees A *Electricity Law of South Africa* (Juta & Co 2014).

Klugman J *Human Development Report 2010: The Real Wealth of Nations: Pathways to Human Development* (Palgrave Macmillan, 2010).

Kotzé L 'Environmental Governance' in Paterson AR & Kotzé LJ *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (Juta & Co 2009) 110.

Kotze L 'Environmental Governance' in Paterson AR & Kotzé LJ *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (Juta & Co 2009) 103.

Gentle L 'Escom to Eskom: From Racial Keynesian Capitalism to Neo-liberalism (1910-1994)' in McDonald *Electric capitalism: Recolonising Africa on the Power Grid* (2009) 50.

Lutzenhiser L 'Social Structure, Culture, and Technology: Modelling the Driving Forces of Household Energy Consumption' in JL Sweeney *et al* (eds) Environmentally Significant Consumption: Research Directions (1997) 77.

Laan T & Beaton C *Strategies For Reforming Fossil-Fuel Subsidies: Practical Lessons from Ghana, France and Senegal. France and Senegal (April 26, 2010)*.

Lang K, Wooders P & Kulovesi K *Increasing the Momentum of Fossil-Fuel Subsidy Reform: A Roadmap for international cooperation* (IISD: 2010).

Larsen B *World Fossil Fuel Subsidies and Global Carbon Emissions* (World Bank Publications 1992).

Lesage D, Thijs van de Graaf & Westphal K *Global Energy Governance in a Multipolar World* (Ashgate Publishing, Ltd.: 2010).

Lowe V 'Sustainable Development and Unsustainable Arguments' in *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford University Press, Oxford: 1999).

Lutzenhiser L 'Social Structure, Culture and Technology: Modelling the Driving Forces of Household Energy Consumption' in Sweeney JL *et al* (eds) *Environmentally Significant Consumption: Research Directions* (National Academies Press 1997).

Lyster R & Bradbrook A *Energy law and the Environment* (Cambridge University Press Port, Melbourne & New York: 2006).

Magraw DB & Hawkes LD 'Sustainable Development' in D Bodansky, J Brunnée & E Hey *The Oxford Handbook of International Environmental Law* (2007) 637.

Mansfield ME *Energy Policy: The Reel World: Cases and Materials on Resources, Energy, and Environmental Law*. *Law Casebook Series*. (Carolina Academic Press, Durham NC: 2001).

McDaid L *Renewable Energy Independent Power Producer Procurement Programme Review 2014*, Electricity Governance Initiative South Africa, supported by World Resources Institute. *Electricity Governance Initiative South Africa–REIPPPP review, 3* (2014).

McDonald D *Electric capitalism: Recolonising Africa on the Power Grid* (Earthscan, 2009).

McDonald DA 'Electric Capitalism: Conceptualising Electricity and Capital Accumulation in (South) Africa 1' in McDonald D (ed) *Electric Capitalism: Recolonizing Africa on the Power Grid* (2012) 29.

McHarg A & Ronne A 'Reducing Carbon-based Electricity Generation: Is the Answer Blowing in the Wind?' in Zillman DN et al (eds) *Beyond the Carbon Economy: Energy Law in Transition* (2008) 288.

Mendonca M *Feed-In Tariffs: Accelerating the Deployment of Renewable Energy* (Earthscan/James & James, 2007).

Mendonça M, Jacobs D & Sovacool BK *Powering the Green Economy: The Feed-in Tariff Handbook* (Earthscan, London: 2009).

Milani B, *Designing the Green Economy: The Post-industrial Alternative to Corporate Globalization* (2000).

Mitchell C & Woodman B 'Regulation and Sustainable Energy Systems' in Baldwin R, Cave M & Lodge M *The Oxford Handbook of Regulation* (2010) 572, 586.

Mitchell C *The Political Economy of Sustainable Energy*, Energy, Climate, and the Environment Series (Palgrave Macmillan, Basingstoke & New York: 2008).

Mitchell T *Carbon Democracy: Political Power in the Age of Oil* (Verso Books, 2011).

Mmagadi M & du Plessis W 'Impact of Environmental Legislation on Mining in South Africa 1' in *Constitution and Law IV: Developments in the Contemporary Constitutional State* (2001) 153.

Morgan B & Yeung K *An Introduction to Law and Regulation: Text and Materials* (Cambridge University Press, Cambridge: 2007).

Morgan T *Reforming Energy Subsidies: An Explanatory Summary of the Issues and Challenges in Removing or Modifying Subsidies on Energy that Undermine the Pursuit of Sustainable Development* (UNEP/Earthprint: 2002).

Mwebaza R & Kotze LJ 'Environmental Governance and Climate Change in Africa: Legal perspectives' (2009) 167 *Institute for Security Studies Monographs* 283

Nkomo JC 'Energy and Economic Development', in Winkler H (ed) *Energy Policies for Sustainable Development in South Africa: Options for the Future* (2006) 84.

Ochs A, Anderson E & Rogers R *Fossil Fuel and Renewable Energy Subsidies on the Rise, Vital Signs* (Springer: 2013).

Olsson G *Water and Energy: Threats and Opportunities* (IWA Publishing: 2012).

Omorogbe YO 'Promoting Sustainable Development through the Use of Renewable Energy: The Role of the Law', in Zillman et al

Ottinger RL 'Legal Frameworks for Energy for Sustainable Development' in Bradbrook & Ottinger 103.

Ottinger RL *Studies Pace University, Center for Environmental Legal, Research New York State Energy, Authority Development, and Energy United States. Dept. of. Environmental Costs of Electricity* (Oceana Publications, New York: 1990).

Ottinger RL, Mathews L & Czahor EN 'Renewable Energy in National Legislation: Challenges and Opportunities.' in Zillman DN et al (eds) *Beyond the Carbon Economy: Energy Law in Transition* (Oxford University Press, Oxford & New York: 2008).

Pace University, UNEP *Handbook for Drafting Laws on Energy Efficiency and Renewable Energy Resources* (UNEP, 2007).

Park PD *Energy Law and the Environment* (Taylor & Francis, London: 2002).

Parker C & Braithwaite J 'Regulation' in Cane P & Tushnet MV (eds) *The Oxford Handbook of Legal Studies* (2005).

Parry ML *et al* (eds) Intergovernmental Panel on Climate Change, *Climate Change 2007: Impacts, Adaptation and Vulnerability: Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, New York: 2007).

Paterson AR & Kotzé LJ *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (Juta & Co Ltd, 2009).

Paterson AR 'Incentive-Based Measures' in Paterson AR & Kotzé LJ *Environmental Compliance and Enforcement in South Africa: Legal Perspectives* (Juta & Co 2009) 296.

Pearce D, Markandya A, Barbier E *London Environmental Economics Centre and Great Britain. Dept. of the Environment. Blueprint for a Green Economy* (1989).

Pegels A 'Pitfalls of Policy Implementation: The Case of the South African Feed-in Tariff' in in JA Haselip *et al Diffusion of Renewable Energy Technologies: Case Studies of Enabling Frameworks in Developing Countries* (2011) 101.101.

Peltzman S *Toward a More General Theory of Regulation,* National Bureau of Economic Research Cambridge, Massachusetts, USA (1976).

Sands P & Peel J *Principles of International Environmental Law* (Cambridge University Press, Cambridge: (2012).

Pittock AB *Climate Change: The Science, Impacts and Solutions* 2nd ed (Earthscan, London: 2009).

Posner RA *Theories of Economic Regulation* National Bureau of Economic Research Cambridge, Mass., USA, (1974).

Prasad P & Visagie E *Renewable Energy Technologies for Poverty Alleviation Initial Assessment Report: South Africa* (University of Cape Town: 2005).

Prosser T *The Regulatory Enterprise: Government, Regulation, and Legitimacy*. (Oxford University Press, Oxford 2010).

López R & Toman MA 'Economic Development and Environmental Sustainability' *New Policy Options* (2006).

Raz, J *The Authority of Law: Essays on Law and Morality* (Clarendon Press, Oxford: 1979).

Robinson NA 'The Resilience Principle' (2014) 5 *IUCN Academy of Env Law eJournal* 19.

Ruiters G 'Free Basic Electricity in South Africa: A Strategy for Helping or Containing the Poor.' In McDonald (ed) *Electric Capitalism: Recolonising Africa on the power grid* (2009) 24.

Sawin J 'National Policy Instruments: Policy Lessons for the Advancement and Diffusion of Renewable Energy Technologies Around the World', in Assmann D, Laumanns U & Uh D (eds) *Renewable Energy: A Global Review of Technologies, Policies and Markets* (2006) 71.

Scheer H *The Solar Economy: Renewable Energy for a Sustainable Global Future* (Routledge 2013).

Scott C, Lacey N & Braithwaite J *Regulating law* (Oxford University Press, Oxford: 2004).

Segger MC & Khalfan A *Sustainable Development Law: Principles, Practices and Prospects* (Oxford University Press, New York: 2004).

Shane F, Peters M, Hoffman SM & Wehrmeyer W (eds) *The Global Challenge of Encouraging Sustainable Living: Opportunities, Barriers, Policy and Practice*. (Edward Elgar Publishing, Cheltenham: 2013).

Shelton D 'Equity' in Bodansky *et al* (eds) *The Oxford Handbook of International Environmental Law* (Oxford University Press, Oxford & New York 2007) 1080.

Shrader-Frechette, K *What Will Work: Fighting Climate Change with Renewable Energy, Not Nuclear Power*. (Oxford University Press, Oxford: 2011).

Sioshansi FP *Competitive Electricity Markets: Design, Implementation, Performance* (Elsevier Science: 2011).

Stavins RN 'Market-based Environmental Policies' in PR Portney & RN Stavins (eds) *Public Policies for Environmental Protection* 2nd ed (Resources for the Future, Washington C: 2000) 31-76;

Stavins RN 'Experience with Market-Based Environmental Policy Instruments.' in K-G Mäler & J Vincent (eds) *Handbook of Environmental Economics* Vol.1 (Elsevier Science, Amsterdam: 2003) 355-435

Stein R & Omidire KB 'Energy' in *Law of South Africa* Volume 9 (Cumulative Supplement 2015) (Juta & Co, 2015)

Stocker TF *et al* (eds) *IPCC, 2013: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (Cambridge University Press, Cambridge & New York, 2013

Strydom H & King N (eds) *Environmental Management in South Africa* (Juta & Co Ltd, Cape Town: 2009).

Strydom HA & Surridge AD 'Energy' in H Strydom & N King *Environmental Management in South Africa* 2nd ed (2009) 775.

Sunstein CR *After the Rights Revolution: Reconceiving the Regulatory State* (Harvard University Press, Cambridge, Mass: 1990).

Tomain JP *Ending Dirty Energy Policy: Prelude to Climate Change* (Cambridge University Press, Cambridge: 2011).

Trainer T *Renewable Energy cannot Sustain a Consumer Society* (Vol. 33) (Springer: 2007).

Van der Linde M & Basson E 'Environment' in Woolman S & Bishop M *Constitutional Law of South Africa* 2nd ed (Juta & Co, 2008).

Van Horen C *Counting the Social Costs: Electricity and Externalities in South Africa* (Elan Press, University of Cape Town Press: 1996).

Veljanovski C 'Economic Approaches to Regulation.' in Baldwin R, Cave M, & Lodge M (eds) *The Oxford Handbook of Regulation,* (Oxford University Press, Oxford: 2010)17-38.

Walker BH & Salt D *Resilience Thinking: Sustaining Ecosystems and People in a Changing World*. (Island Press, Washington: 2006).

Winkler H, Human Sciences Research Council. *Cleaner Energy, Cooler Climate: Developing Sustainable Energy Solutions for South Africa*. Cape Town: HSRC Press (2004).

World Commission on Environment and Development: Our common future. (Oxford University Press: Oxford 1987).

Zillman DN et al (eds) *Beyond the Carbon Economy: Energy Law in Transition* (Oxford University Press, Oxford & New York: 2008).

8.2. JOURNAL ARTICLES

Adamantiades A & Kessides I 'Nuclear Power for Sustainable Development: Current Status and Future Prospects.' (2009)37 *Energy Policy* 5149-5166.

Algotsson E 'Wildlife Conservation through People-Centred Approaches to Natural Resource Management Programmes and the Control of Wildlife Exploitation' (2006)11 *Local Environment* 79.

Antheaume N 'Valuing External Costs - From Theory to Practice: Implications for Full Cost Environmental Accounting' (2004)13 *European Accounting Review* 443-464.

Apergis N et al 'On the Causal Dynamics between Emissions, Nuclear Energy, Renewable Energy, and Economic Growth.' (2010)69 *Ecological Economics* 2255-2260.

Aronson J, et al 'South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities' *Endangered Wildlife Trust (EWT) Report* (2014).

Baker L & Wlokas H 'South Africa's Renewable Energy Procurement: A New Frontier' *Tyndall Centre for Climate Change Research* (2014).

Baker L, Newell P & Phillips J 'The Political Economy of Energy Transitions: The Case of South Africa.' (2014)19 *New Political Economy,* 791-818.

Banerjee S 'Who Sustains Whose Development? Sustainable Development and the Reinvention of Nature'

Banks D & Schäffler J 'The potential contribution of renewable energy in South Africa' *Draft Update Report*, EarthLife, South Africa (2006).

Barbier E 'The Policy Challenges for Green Economy and Sustainable Economic Development.' (2011)35 *Natural Resources Forum* 233-245.

Bazilian M & Onyeji I 'Fossil Fuel Subsidy Removal and Inadequate Public Power Supply: Implications for Businesses '(2012)45 *Energy Policy* 1-5.

Bebbington J & Gray R 'An Account of Sustainability: Failure, Success and a reconceptualization.' (2001)12 *Critical Perspectives on Accounting* 557-588.

Bechberger M & Reiche D 'Renewable Energy Policy in Germany: Pioneering and Exemplary Regulations' (2004)8 *Energy for Sustainable Development* 47-57.

Beck F & Martinot E 'Renewable Energy Policies and Barriers' (2004)5 *Encyclopaedia of Energy* 365-383.

Becker B & Fischer D 'Promoting Renewable Electricity Generation in Emerging Economies' (2013)56 *Energy Policy* 446-455.

Becker LJ, Seligman C, Fazio RH & Darley JM 'Relating Attitudes to Residential Energy Use.' (1981)13 *Environment and Behavior* 590-609.

Bekker B et al 'South Africa's Rapid Electrification Programme: Policy, Institutional, Planning, Financing and Technical Innovations' (2008)36 *Energy Policy* 3115.

Beveridge R & Kern K 'The *Energiewende* in Germany: Background, Developments and Future Challenges.' (2013) 4 *Renewable Energy L. & Policy Rev.* 3.

Biermann F, Pattberg P, Van Asselt H & Zelli F 'The Fragmentation of Global Governance Architectures: A Framework for Analysis' (2009)4 *Global Environmental Politics* 14-40.

Birol F 'World Energy Outlook 2010.' (2010) *International Energy Agency*.

Black J 'Constructing and Contesting Legitimacy and Accountability in Polycentric Regulatory Regimes' (2008)2 *Regulation & Governance* 137-64.

Black J 'Critical Reflections on Regulation' (2002) 27 *Aust. J. Legal Philosophy* 1.

Black J 'Decentring Regulation: Understanding the Role of Regulation and Self Regulation in a Post-Regulatory World' (2001)54 *Current Legal Problems* 103.

Black J 'Regulatory Conversations.' (2002)29 *Journal of Law and Society* 163-96.

Böhm S, Misoczky MC & Moog S 'Greening Capitalism? A Marxist Critique of Carbon Markets.' (2012) 33 *Organization Studies* 1617-38.

Bosman C Kotze L & du Plessis W 'The Failure of The Constitution to Ensure Integrated Environmental Management from a Co-Operative Governance Perspective' (2004) 19 *SA Public Law* 41.

Bradbrook AJ 'A Legislative Framework for Renewable Energy and Energy Conservation' (1997) 15 *J Energy & Nat Resources L* 313, 316-17.

Bradbrook AJ 'Green Power Schemes: The Need for a Legislative Base' (2002) 26 *Melbourne Univ LR* 15, 17.

Bradbrook AJ 'Energy Law: The Neglected Aspect of Environmental Law.' (1993)19 *Melb. UL Rev.* 1.

Bradbrook AJ & Gardam JG 'Placing Access to Energy Services Within a Human Rights Framework (2006) 28 *Human Rights Quarterly* 389-415.

Bradley RL 'Renewable energy: Not cheap, Not Green? (1998)*17 Strategic Planning for Energy & the Environment* 15-21.

Braithwaite J 'Responsive Regulation and Developing Economies' (2006) 5 *World Development* 884-98.

Brand U 'Green Economy the Next Oxymoron? No Lessons Learned from Failures of Implementing Sustainable Development' (2012) *GAIA-Ecological Perspectives for Science and Society* 28-32.

Bray E 'Focus on the National Environmental Management Act: Cooperative Governance in the Context of the National Environmental Management Act 107 of 1998' (1999) 6 *SAJELP* 3.

Brenton P, Jones GE & Jensen MF 'Carbon Labelling and Low Income Country Exports: A Review of the Development Issues.' (2009)27 *Development Policy Review* 243-67.

Buckman G & Diesendorf M 'Design Limitations In Australian Renewable Electricity Policies.' (2010) *38 Energy Policy* 3365-3376.

Butler L & Neuhoff K 'Comparison of Feed-in Tariff, Quota and Auction Mechanisms to Support Wind Power Development' (2008) 33 *Renewable Energy* 938.

Calyolsen S 'Tangled in the Wires: An Assessment of the Existing US Renewable Energy Legal Framework' (2006)46 *Natural Resources Journal* 759.

Cass N & Walker G 'Emotion and rationality: The Characterisation and Evaluation of Opposition to Renewable Energy Projects' (2009)*2 Emoti on, Space and Society* 62-69.

Charters WWS 'Developing Markets for Renewable Energy Technologies' (2001) 22 *Renewable Energy* 217-22.

Cherni JA & Kentish J 'Renewable Energy Policy and Electricity Market Reforms in China' (2007) 35 *Energy Policy* 3616, 3627.

Ciarreta A, Espinosa MP & Pizarro-Irizar C 'Is Green Energy Expensive? Empirical Evidence from the Spanish Electricity Market. (2014)69 *Energy Policy* 205-215.

Cicchetti CJ 'Going green and getting regulation right : a primer for energy efficiency.' (2009) *Vienna, Va.: Public Utilities Reports*.

Clémençon R 'Welcome to the Anthropocene Rio+ 20 and the Meaning of Sustainable Development' (2012) 21 *The Journal of Environment & Development* 311-338.

Cook S & Smith K 'Introduction: Green Economy and Sustainable Development: Bringing Back the 'Social'.' (2012)55 *Development* 5-9.

Curnow P, Tait L & Millar I 'Financing Renewable Energy Projects in Asia: Barriers and Solutions' (2010) 1 *Renewable Energy Law and Policy Rev* 101.

D'Sa A 'Integrated Resource Planning (IRP) and Power Sector Reform in Developing Countries' (2005) 33 *Energy Policy* 1271.

Dal Bó E 'Regulatory Capture: A Review.' (2006) 22 *Oxford Review of Economic Policy* 203-225.

Dasgupta C 'Reflections on the Relationship between the "Green Economy" and Sustainable Development' (2011) 20 *UNCTAD* 33-35.

Davies LL 'Alternative Energy and the Energy-Environment Disconnect' (2009) 46 *Idaho LR* 473.

Davies LL & Allen K 'Feed-in Tariffs in Turmoil' (2014) 116 *West Virginia Law Review* 937.

Davis M 'Rural Household Energy Consumption: The Effects of Access to Electricity: Evidence from South Africa.' (1998)26 *Energy Policy* 207-217.

de Jongh D, Ghoorah D & Makina A 'South African Renewable Energy Investment Barriers: An Investor Perspective. (2014) 25 *JESA* 15-27.

Demange LH 'The Principle of Resilience' (2013) 30 *Pace Environmental LR* 695-1278.

Devarajan S, Go DS, Robinson S & Thierfelder K 'Tax Policy to Reduce Carbon Emissions in South Africa.' *World Bank Policy Research Working Paper Series No 4933* (2009).

Devine-Wright P 'Reconsidering Public Attitudes and Public Acceptance of Renewable Energy Technologies: A Critical Review. *Manchester: School of Environment and Development, University of Manchester* (2007). http://www.*sed.manchester.ac.uk/research/beyond_nimbyism*

Dincer I 'Renewable Energy and Sustainable Development: A Crucial Review.' (2000) 4 *Renewable & Sustainable Energy Reviews* 157-175.

Dincer I 'Environmental Impacts of Energy.' (1999) 27 *Energy Policy* 845-854.

Du Plessis AA 'Adding Flames to the Fuel: Why Further Constitutional Adjudication Is Required for South Africa's Constitutional Right to Catch Alight' (2008) 15 *SAJELP* 57.

Du Plessis AA 'South 'Africa's Constitutional Environmental Right (generously) Interpreted: What is in it for Poverty?' (2011) 27 *SAJHR* 279-307.

Du Plessis AA 'Fulfilment of South Africa's Constitutional Environmental Right.' LLD thesis, North West University, South Africa (2008) 38.

Du Plessis W 'Energy Law and Environmental Protection in South Africa' (2003) *Energy and the Environment* 103, 111.

Du Plessis W 'Legal Mechanisms for Cooperative Governance in South Africa: Successes and Failures.' (2005) 23 *SA Public Law* 87-110.

Du Toit *Promoting Renewable Energy in South Africa: An Overview of Recent Legal and Policy Developments* 18(2) (2012) South African Journal of Environmental Law and Policy 75.

Dugard J, St Clair AL & Gloppen S 'Introduction: Climate Change Justice: Narratives, Rights and the Poor' (2013) 29 *SAJHR* 6.

Algotsson E 'Wildlife Conservation Through People-Centred Approaches to Natural Resource Management Programmes and the Control of Wildlife Exploitation' (2006) 11 *Local Environment* 79.

Eberhard A 'Feed in Tariff or Auctions? Procuring Renewable Energy Supply in South Africa.' *Viewpoint: Public Policy for the Private Sector* (2013) 338.

Eberhard A 'From State to Market and Back Again: South Africa's Power Sector Reforms.' (2005) *Economic and Political Weekly* 5309-5317.

Eberhard A 'South Africa's Renewable Energy IPP Procurement Program: Success Factors and Lessons.' (World Bank, Washington DC: 2014).

Eberhard A 'The Future of South African Coal: Market, Investment, and Policy Challenges.' Working Paper No 100, *Stanford Programme on Energy and Sustainable Development* (2011).

Eberhard A & Gratwick KN 'IPPs in Sub-Saharan Africa: Determinants of Success.' (2011) 39 *Energy Policy* 5541-5549.

Eberhard A & Shkaratan M 'Powering Africa: Meeting the Financing and Reform Challenges.' (2012) 42 *Energy Policy* 9-18.

Eberhard A *et al* 'Africa's Power Infrastructure: Investment, Integration, Efficiency.' *World Bank Publications* (2011).

Eberhard A *et al* 'Underpowered: The State of the Power Sector in Sub-Saharan Africa.' *Background Paper 6* (2008).

Eberhard A 'Energy Consumption Patterns and Supply Problems in Underdeveloped Areas in South Africa.' (1990)7 *Development Southern Africa* 335-346.

Ellis J 'The Effects of Fossil-Fuel Subsidy Reform: A Review of Modelling and Empirical Studies.' *Available at SSRN 1572397* (2010).

Epstein PR *et al* 'Full Cost Accounting for the Life Cycle of Coal.' (2011)1219 *Annals of the New York Academy of Sciences* 73-98.

Field TL 'Liability to Remedy Asbestos Pollution' (2006) *Journal of Environmental Law* 479-494.

Field TL 'Realizing the National Environmental Management Act's Potential to Bring Polluters to Book.' (2004)121 *SALJ* 772.

Flottum K & Gjerstad O 'The Role of Social Justice and Poverty in South Africa's National Climate Change Response White Paper' (2013) 29 *SAJHR* 61.

Foster-Pedley J & Hertzog H 'Financing Strategies for Growth in the Renewable Energy Industry in South Africa' (2006) 17 *JESA* 57.

Kuni D 'Roadmap to a thriving Electricity Supply Industry in SA' (2012) 64 *Focus: The Journal of the Helen Suzman Foundation* 38.

Lavin C & Aeck MH 'The Potential Role of Renewable Energy in Meeting the Millennium Development Goals.' REN21 Network (2005) *The World Watch Institute*.

Foster-Pedley J & Hertzog H 'Financing Strategies for Growth in the Renewable Energy Industry in South Africa.' (2006) 17 *JESA* 57-64.

Gadenne D, Sharma B, Kerr, D & Smith T 'The Influence of Consumers' Environmental Beliefs and Attitudes on Energy Saving Behaviours' (2011) 39 *Energy Policy* 7684-7694.

Gaunt CT 'Electricity Distribution Industry Restructuring in South Africa: A Case Study.' (2008) 36 Energy *Policy* 3448-3459.

Giddings, B, Hopwood B & O'brien G 'Environment, Economy and Society: Fitting them

Together into Sustainable Development.' (2002) 10 *Sustainable Development* 187.

Goldemberg J 'The Promise of Clean Energy' (2006) 34 *Energy Policy* 2185-2190.

Goldman DP, McKenna JH & Murphy LM 'Financing Projects that Use Clean-Energy Technologies: An Overview of Barriers and Opportunities' *National Renewable Energy Laboratory* (2005).

Goldthau A & Sovacool BK 'The Uniqueness of the Energy Security, Justice, and Governance Problem.' (2012) 41 *Energy Policy* 232-240.

Grabosky P 'Beyond Responsive Regulation: The Expanding Role of Non-State Actors in the Regulatory Process.' (2013) 7 *Regulation & Governance* 114-123.

Graham J, Amos B & Plumptre T 'Principles for good governance in the 21st century.' (2003) 15 *Policy Brief* 1-6.

Gratwick KN & Eberhard A 'Demise of the standard model for power sector reform and the emergence of hybrid power markets.' (2008) 36 *Development Policy Review* 3948-3960.

Gratwick KN & Eberhard A 'An Analysis of Independent Power Projects in Africa: Understanding Development and Investment Outcomes' (2008) 26 *Development Policy Review* 309-338.

Greening LA, Greene DL & Difiglio C 'Energy Efficiency and Consumption - The Rebound Effect-a Survey.' (2000) 28 *Energy policy* 389-401.

Guruswamy LD 'Energy, Environment & Sustainable Development' (2005) 8 *Chap. L. Rev.* 77-309.

Guruswamy L 'Energy Justice and Sustainable Development' (2010) 21 *Colorado Journal of International Environmental Law & Policy* 77.

Guruswamy L 'The Law and Economics of Development and Environment: Sustainable Energy: A Preliminary Framework' (2005) 38 *Ind. L. Rev.* 671.

Hamdouch A & M Depret 'Policy Integration Strategy and the Development of the 'Green Economy': Foundations and Implementation Patterns' (2010) 53 *Journal of Environmental Planning and Management* 473-490.

Hantke-Domas M 'The Public Interest Theory of Regulation: Non-Existence or Misinterpretation?' (2003) 15 *European Journal of Law and Economics* 165-194.

Haselip J 'Fit for Use Everywhere? Assessing Experiences with Renewable Energy Feed-in Tariffs.' *Diffusion of Renewable Energy Technologies* (2011) 89.

He K, Huo H, & Zhang Q 'Urban Air Pollution in China: Current Status, Characteristics, and Progress' (2002) 27 *Annual review of energy and the environment* 397-431.

Herring H 'Energy Efficiency -A Critical View.' (2006) 31 *Energy* 10-20.

Hester RE & Harrison RM (eds) Sustainability and Environmental Impact of Renewable Energy Sources. Vol 19 *Royal Society of Chemistry* (2003).

Hilson G & Maconachie R ' "Good Governance" and the Extractive Industries in Sub-Saharan Africa.' (2008) 30 *Mineral Processing & Extractive Metallurgy Review* 52-100.

Hiroux C & Saguan M 'Large-scale Wind Power in European Electricity Markets: Time for Revisiting Support Schemes and Market Designs?' (2010) 38 *Energy Policy* 3135-3145.

Hohmeyer O 'Renewables and the Full Costs of Energy.' (1992) 20 *Energy Policy* 365-375.

Holton CJ 'What are the effects of fossil-fuel subsidies on growth, the environment, and inequality?' Being a Student Dissertation presented at the School of Economics, University of Nottingham (2012).

Hope E & Singh B 'Energy Price Increases in Developing Countries : Case Studies of Colombia, Ghana, Indonesia, Malaysia, Turkey, and Zimbabwe.' *World Bank Policy Research Working Paper* 1442 (1995).

Howells MI, *et al* 'A Model of Household Energy Services in a Low-Income Rural African Village.' (2005) 33 *Energy Policy* 1833-1851.

Humby T 'Maccsand in the Constitutional Court: Dodging the NEMA Issue [Discussion of *Maccsand (Pty) Ltd v City of Cape Town* 2012 4 SA181 (CC)]' (2013) 24 *Stellenbosch LR* 55-72.

Humby T 'Maccsand: Intergovernmental Relations and the Doctrine of Usurpation.' (2012) 27 *SA Public Law* 628-638.

Humby T 'The Environmental Management Programe: Legislative Design, Administrative Practice and Environmental Activism.' (2013) 130 *SALJ* 60-84.

Humby TL 'One Environmental System: Aligning the Laws on the Environmental Management of Mining in South Africa' (2015) 33(2) *Journal of Energy & Natural Resources Law* 110.

Humby TL 'Revisiting Mining and Municipal Planning: *Mtunzini Conservancy v Tronox Kzn Sands Ltd*: Case Note.' (2013) 29 *SAJHR* 651-665.

Hund J 'Globalisation and the Rule of Law: Socio-Economic Reflections.' (2004) 19 *SA Public Law,* 25-45.

Inglesi-Lotz R & Blignaut J 'Estimating the Opportunity Cost of Water for the Kusile and Medupi Coal-Fired Electricity Power Plants in South Africa.' (2012) 23 *JESA* 77.

Institute for Global Dialogue (IGD) 'Climate Change and Development: Towards An Alternative Energy Future for Southern Africa?' Proceedings of the IGD/FES Conference, held in Tshwane/Pretoria, South Africa on 17-18 August 2009.

Intergovernmental Panel on Climate Change. Working Group II, and Intergovernmental Panel on Climate Change. 'Climate Change 2007: Impacts, Adaptation and Vulnerability : Working Group Ii Contribution to the Fourth Assessment Report of the IPCC Intergovernmental Panel on Climate Change.' IPCC Secretariat.

Jessop B 'Capitalism and its Future: Remarks on Regulation, Government and Governance' (1997) 4 *Review of International Political Economy* 561-581.

Jessop B 'Economic and Ecologica Crises: Green New Deals and No-Growth Economies' (2012) 55 *Development* 17-24.

Johannessen J 'Climate Change, Poverty and Climate Justice in South African media: The case of COP17' (2013) 29 *SAJHR* 32, 34.

Karakosta C, Pappas C, Marinakis V & Psarras J 'Renewable Energy and Nuclear Power Towards Sustainable Development: Characteristics and Prospects.' (2013) 22 *Renewable & Sustainable Energy Reviews* 187-197.

Kaygusuz K 'Energy for Sustainable Development: A Case of Developing Countries.' (2012) 16 *Renewable & Sustainable Energy Reviews* 1116-1126.

Klare KE 'Legal Culture and Transformative Constitutionalism' (1998) 14 *SAJHR* 146.

Klasen S 'Social, Economic, and Environmental Limits for the Newly Enfranchised in South Africa?' (2002) 50 *Economic Development and Cultural Change* 607-642.

Kolstad I & Wiig A 'Is transparency the key to reducing corruption in resource-rich countries?' (2009) 37 *World Development* 521-532.

Koons JE 'What is Earth Jurisprudence?: Key Principles to Transform Law for the Health of the Planet.' (2009) 18 *Penn State Environmental LR* 47-293.

Kotzé LJ 'Improving unsustainable environmental governance in South Africa: The case for holistic governance.' (2006) 9/1 *Potchefstroom Electronic Law Journal* 1/44.

Kotzé LJ 'Phiri, the Plight of the Poor and the Perils of Climate Change: Time to Rethink Environmental and Socio-Economic Rights in South Africa?' (2010) 2 *Journal of Human Rights and the Environment* 135-160.

Kotze LJ 'Revisiting the South African Integrated Pollution Prevention and Control (IPCC) Regime: A Critical Survey of Recent Developments.' (2007) 22 *SA Public Law* 34-60.

Kotzé LJ 'The Judiciary, the Environmental Right and the Quest for Sustainability in South Africa: A Critical Reflection' (2007) 3 *Review of European Community & International Environmental Law* 298-311.

Krupa J & Burch S 'A New Energy Future for South Africa: The Political Ecology of South African Renewable Energy.' (2011) 39 *Energy Policy* 6254-6261.

Kuni D 'Challenges in Electricity Regulation in the Republic of South Africa (RSA)' (2013) *Africa Energy Yearbook* 15

Kuni D 'Roadmap to a Thriving Electricity Supply Industry in SA' (2012) 64 *Focus: The Journal of the Helen Suzman Foundation* 38.

Laan T & Beaton C 'Strategies for Reforming Fossil-Fuel Subsidies: Practical Lessons from Ghana, France and Senegal.' France and Senegal (2010).

Lang M & Lang A 'The 2014 German renewable energy sources act revision–from feed-in tariffs to direct marketing to competitive bidding.' (2015) 33:2 *Journal of Energy & Natural Resources Law* 131.

Langa P 'The role of the Constitution in the struggle against poverty' (2011) 22 *Stellenbosch Law Review* 446-51.

Langa P 'Transformative Constitutionalism' (2006) 17 *Stellenbosch LR* 351.

Leal-Arcas R & Filis A 'The Fragmented Governance of the Global Energy Economy: A Legal-Institutional Analysis.' (2013) 6 *Journal of World Energy Law and Business* 348-405.

Leary D & Esteban M 'Climate Change and Renewable Energy from the Ocean and Tides: Calming the Sea of Regulatory Uncertainty' (2009) 24 *The Int J of Marine and Coastal Law* 617.

Levine ME & Forrence JL 'Regulatory Capture, Public Interest and the Public Agenda: Toward a Synthesis.' (1990) *Journal of Law, Economics & Organization* 167-198.

Lloyd P 'Restructuring South Africa's Electricity Supply Industry' (2012) 64 *Focus: The Journal of the Helen Suzman Foundation* 4, 10.

Lloyd P, Cowan B & Mohlakoana N 'Improving Access to Electricity and Stimulation of Economic Growth and Social Upliftment.' Paper presented at the Contribution to the Conference 'Improving Access to Modern Energy Services through CDM and Technology Transfer.' Eskom Conference Centre, (2004).

Lowe P 'Regulating Renewable Energy in the European Union' (2010) 1 *Renewable Energy Law and Policy Rev* 17, 17-18.

Lutzenhiser L 'A Cultural Model of Household Energy Consumption.' (1992) 17 *Energy* 47-60.

Lutzenhiser L 'Social Structure, Culture and Technology: Modelling the Driving Forces of Household Energy Consumption.' (1997) *Environmentally Significant Consumption: Research Directions* 129.

Marchant GE 'Sustainable Energy Technologies: Ten Lessons from the History of Technology Regulation' (2009) 18 *Widener LJ* 831.

Martinot E *et al* 'Renewable Energy Markets in Developing Countries' (2002)27 *Annual Review of Energy & the Environment* 309-348.

Martinot E, Dienst C, Weiliang L & Qimin C 'Renewable Energy Futures: Targets, Scenarios and Pathways.' (2007) 32 *Annual Review of Energy & the Environment* 205-239.

Masondo H & Nott G 'The Bid for Private Power: Energy Law' (2011) 11 *Without Prejudice* 55-57.

McDaid L 'Renewable Energy Independent Power Producer Procurement Programme Review 2014. Electricity Governance Initiative South Africa, Supported by World Resources Institute.' (2014) 3 *Electricity Governance Initiative South Africa–REIPPPP review* 3.

Menanteau P, Finon D & Lamy ML 'Prices Versus Quantities: Choosing Policies for Promoting the Development of Renewable Energy.' (2003) 31 *Energy Policy* 799-812.

Menyah K & Wolde-Rufael Y 'Energy Consumption, Pollutant Emissions and Economic Growth in South Africa' (2010) 32 *Energy Economics* 1380.

Mitchell T 'Carbon Democracy' (2009) 38 *Economy & Society* 401.

Montmasson-Clair G, K Moilwa & G Ryan 'Regulatory Entities Capacity Building Project, Review of Regulators Orientation and Performance: Review of Regulation in Renewable Energy' Centre for Competition, Regulation and Economic Development (CCRED) (2014).

Msimanga B & Sebitosi A 'South Africa's Non-Policy Driven Options for Renewable Energy Development.' (2014) 69 *Renewable Energy* 420-427.

Muñoz M, Oschmann V & Tàbara JD 'Harmonization of Renewable Electricity Feed-in Laws in the European Union' (2007) 35 *Energy Policy* 3104.

Murombo T 'From Crude Environmentalism to Sustainable Development: *Fuel Retailers'* (2008) 125 *SALJ* 488.

Nast M, Langniβa M & Leprich U 'Instruments to Promote Renewable Energy in the German Heat Market–Renewable Heat Sources Act' (2007) 32 *Renewable Energy* 1127.

Nel S 'Transforming The Energy Supply Industry' (2012) 64 *Focus: The Journal of the Helen Suzman Foundation* 15.

Ocampo J 'The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective–Summary of Background Papers' Paper presented at the United Nations Report by a Panel of Experts to Second Preparatory Committee Meeting for United Nations Conference on Sustainable Development (2011).

Ochs A, Anderson E & Rogers R 'Fossil Fuel and Renewable Energy Subsidies on the Rise.' (2013) *Springer* 22-24.

Odhiambo NM 'Electricity Consumption and Economic Growth in South Africa: A Trivariate Causality Test.' (2009) 31 *Energy Economics* 635-40

Odhiambo NM 'Energy Consumption, Prices and Economic Growth in Three SSA Countries: A Comparative Study' (2010) 38 *Energy Policy* 2463.

Ogus AI 'Regulation Revisited.' (2009) 2 *Public Law* 332-346.

Ogus, A 'Regulatory Institutions And Structures.' (2002) 73 *Annals of Public and Cooperative Economics* 627-648.

Ogus, AI 'Regulatory Law: Some Lessons from the Past.' (1992) 12 *Legal Studies* 1-19.

Olivier NJJ, Williams C & Badenhorst PJ '*Maccsand (Pty) Ltd v City of Cape Town* 2012 (4) SA 181 (CC).' (2012) 15 *PER* 537-65.

Omer AM 'Energy, Environment and Sustainable Development.' (2008) 12 *Renewable and Sustainable Energy Reviews* 2265-300.

Oniemola PK 'Integrating Renewable Energy into Nigeria's Energy Mix through the Law: Lessons from Germany.' (2011) 1 R*enewable Energy L. & Policy Review 29.*

Ottinger RL 'Energy Efficiency: The Best Immediate Option for a Secure, Clean, Healthy Future' (2006) 30 *Natural Resources Forum* 318, 326.

Ottinger RL 'Biofuels: Potential, Problems and Solutions' (2009) 19 *Fordham Env LR* 253.

Ottinger RL 'Getting At The True Cost Of Electric Power' (1990) 3 *The Electricity Journal* 14-23.

Ottinger RL & Miller SE 'Bioenergy in Developing Countries: Potential and Risks' (2010) 1 *Renewable Energy Law & Policy Rev.* 23.

Ottinger RL & Williams R 'Renewable Energy Resources for Development' (2002) 32(2) *Environment Law* 101.

Outka U 'Environmental Law and Fossil Fuels: Barriers to Renewable Energy.' (2012) 65 *Vand. L. Rev*. 1679-1875.

Outka U 'Siting Renewable Energy: Land Use and Regulatory Context.' (2010) 37 *Ecology Law Quarterly* 1041.

Owen AD 'Renewable Energy: Externality Costs as Market Barriers. (2006) 34 *Energy Policy* 632-642.

Painuly JP 'Barriers To Renewable Energy Penetration; A Framework for Analysis.' (2001) 24 *Renewable Energy* 73-89.

Pappas C, Karakosta C, Marinakis V & Psarras J 'A Comparison of Electricity Production Technologies in Terms of Sustainable Development.' (2012) *64 Energy Conversion and Management* 626-632.

Pasqualetti MJ 'Social Barriers to Renewable Energy Landscapes.' (2011) 101 *Geographical Review* 201-223.

Paterson A 'Fuelling the Sustainable Development Debate in South Africa.' (2006) 123 *SALJ* 53.

Paterson A 'Pruning the Money-Tree to Ensure Sustainable Growth: Facilitating Sustainable Development through Market-Based Instruments. (2006) 3 *PER* 12-27.

Pegels A 'Renewable Energy in South Africa: Potentials, Barriers and Options for Support' (2010) 38 *Energy Policy* 4945-4954.

Pegels, A 'Pitfalls of Policy Implementation: The Case of the South African Feed-in Tariff.' in JA Haselip *et al Diffusion of Renewable Energy Technologies: Case Studies of Enabling Frameworks in Developing Countries* (2011) 101.

Peltzman S 'Toward a More General Theory of Regulation.' National Bureau of Economic Research Cambridge, Massachusetts, USA, 1976.

Pepermans G *et al* 'Distributed Generation: Definition, Benefits and Issues.' (2005) 33 *Energy Policy* 787-798.

Pete S 'Shuffling Deckchairs on the Titanic? A Critique of the Assumptions Inherent in the South African *Fuel Retailers* Case from the Perspective of Deep Ecology' (2008) 15 *SAJELP* 103.

Poortinga W, Steg L & Vlek C 'Values, Environmental Concern, and Environmental Behavior: A Study into Household Energy Use.' (2004) 36 *Environment and Behavior* 70-93.

Pound R 'Law in Books and Law in Action' (1910) 44 *Am. LR* 12.

Posner RA 'Theories of Economic Regulation.' (1974) 5 *Bell Journal of Economics and Management Science* 335.

Praetorius B & Bleyl JW 'Improving the Institutional Structures for Disseminating Energy Efficiency in Emerging Nations: A Case Study for Energy Agencies in South Africa.' (2006) 34 *Energy Policy* 1520-1531.

Prasad G, Stone A, Hughes A & Stewart T 'Towards the Development of an Energy-Water-Food Security Nexus Based Modelling Framework as a Policy and

Planning Tool for South Africa.' Paper presented at the Strategies to Overcome Poverty and Inequality Conference. University of Cape Town, 2012.

Procurement Programme Review 2014. Electricity Governance Initiative South Africa, supported by World Resources Institute' Electricity Governance Initiative South Africa-REIPPPP review 3 (2014): 3.

Prosser T 'Theorising Utility Regulation.' (1999) 62 *Modern Law Review* 196.

Prosser T 'Regulation And Social Solidarity.' (2006) 33 *Journal of Law and Society* 364-387.

Rayner S 'How to Eat an Elephant: A Bottom-up Approach to Climate Policy.' (2010) 10 *Climate Policy* 615-621.

Reddy S & Painuly JP 'Diffusion of renewable energy technologies-Barriers and Stakeholders' perspectives. (2004)29 *Renewable Energy* 1431-1447.

Rehbinder E 'Contribution to the Development of Environmental Law.' (2012) 42 *Envtl. Policy & Law* 210.

Retief F & Chabalala B 'The Cost of Environmental Impact Assessment (EIA) In South Africa' (2009) 11 *Journal of Environmental Assessment Policy and Management* 51-68.

Riedy C & Diesendorf M 'Financial Subsidies To The Australian Fossil Fuel Industry' (2003) 31 *Energy Policy* 125-137.

Ringel M 'Fostering the Use of Renewable Energies in the European Union: The Race between Feed-in Tariffs and Green Certificates.' (2006) 31 *Renewable Energy* 1-17.

Robinson NA 'The Resilience Principle' (2014) 5 *IUCN Academy of Environmental Law eJourna*l 19.

Robinson NA 'Beyond Sustainability: Environmental Management for the Anthropocene Epoch.' (2012) 12 *Journal of Public Affairs* 181-194.

Robinson JB & Herbert D 'Integrating Climate Change and Sustainable Development.' (2001) 1 *International Journal of Global Environmental Issues* 130-149.

Rogner HH 'Nuclear Power and Sustainable Development.' (2010) 64 *Journal of International Affairs* 137-163.

Rossouw N & Wiseman K 'Learning from the Implementation of Environmental Public Policy Instruments after the First Ten Years of Democracy in South Africa.' (2004) 22 *Impact Assessment and Project Appraisal* 131-140.

Roussos M 'Energy Planning and Sustainability' (2012) 64 *Focus* 69, 72.

Rudra N & Jensen, NM 'Globalization and the Politics of Natural Resources.' (2011)44 *Comparative Political Studies* 639-661.

Russell IS 'The Sustainability Principle in Sustainable Energy' (2008) 44 *Tulsa L. Rev.* 121.

Scholtz W 'The Anthropocentric Approach to Sustainable Development in the National Environmental Management Act and the Constitution of South Africa' (2005) 18 *Journal of South African Law* 69.

Schubert R, Blasch J & Hoffmann K 'Environmental Protection, Energy Policy and Poverty Reduction–Synergies of an Integrated Approach.' *Energy Policy and Poverty Reduction–Synergies of an Integrated Approach (April 1, 2007). IED Working Paper*, *1*.

Schuman S & Lin A 'China's Renewable Energy Law and its Impact on Renewable Power in China: Progress, Challenges and Recommendations for Implementation' (2012) 51 *Energy Policy* 89.

Sebitosi AB & Pillay P 'Grappling with a Half-Hearted Policy: The Case of Renewable Energy and the Environment in South Africa' (2008) 36 *Energy Policy* 2513-2516.

Shapiro S & Tomain J 'Rethinking Reform of Electricity Markets.' (2005) 40 *Wake Forest LR* 497-543.

Shum KL & Watanabe C 'Network Externality Perspective of Feed-In-Tariffs (FIT) Instruments: Some Observations and Suggestions.' (2010) *38 Energy Policy* 3266-3269.

Sibanda S 'Not Purpose-made! Transformative Constitutionalism, Post-independence Constitutionalism and the Struggle to Eradicate Poverty' (2011) 22 *Stellenbosch LR* 482.

Sithebe T & Kolobe T 'Is Vertical Separation a Prerequisite to Enhancing Competition in the South African Energy Industry?'. (2014) 17 *Journal of Economic and Financial Sciences: Special Issue* 527-546.

Smith DK 'What is regulation? A Reply to Julia Black' (2002) 27 *Austl. J. Legal Philosophy* 39.

Smith S 'Climate Change and South Africa: A Critical Analysis of the National Climate Change Response White Paper and the Push for Tangible Practices and Media-driven Initiatives' (2013) 7 *Global Media Journal - African Edition* 47.

Smolin DM 'The Paradox of the Future in Contemporary Energy Policy: A Human Rights Analysis' (2009) 40 *Cumb. LR* 135.

Söderholm P & Sundqvist T 'Pricing Environmental Externalities in the Power Sector: Ethical Limits and Implications for Social Choice.' (2003) 46 *Ecological Economics* 333-50.

Sovacool BK 'Renewable Energy: Economically Sound, Politically Difficult' (2008) 21 *The Electricity Journal* 18-29.

Sovacool BK 'A Comparative Analysis of Renewable Electricity Support Mechanisms For Southeast Asia.' (2010) 35 *Energy* 1779-1793.

Sovacool BK 'The Importance of Comprehensiveness in Renewable Electricity and Energy Efficiency Policy' (2009) 37 *Energy Policy* 1529, 1531.

Sovacool, BK & Brown MA 'Competing Dimensions of Energy Security: An International Perspective.' 2010) 35 *Annual Review of Environment and Resources* 77-108.

Spalding-Fecher R 'Energy and Sustainable Development in South Africa' (2002) *Sustainable Energy Watch* 10/42.

Spalding-Fecher R 'Indicators of Sustainability for the Energy Sector: A South African Case Study.' (2003) 7 *Energy for Sustainable Development* 35-49.

Spalding-Fecher R & Matibe DK 'Electricity and Externalities In South Africa.' (2003) 31 *Energy Policy* 721-734.

Spalding-Fecher R, Clark A, Davis M & Simmonds G 'The Economics Of Energy Efficiency for the Poor: A South African Case Study.' (2002) 27 *Energy* 1099-1117.

Spalding-Fecher R, Williams A & van Horen C 'Energy and Environment in South Africa: Charting a Course to Sustainability.' (2000) 4 *Energy for Sustainable Development* 8-17.

Steele M 'Water Hungry Coal: Burning South Africa's Water to Produce Electricity' Greenpeace, South Africa (2012)

Steinberg C 'Can Reasonableness Protect the Poor? A Review of South Africa's Socio-Economic Rights Jurisprudence' (2006) 123 *SALJ* 14-40.

Stephenson J *et al* 'Energy Cultures: A Framework for Understanding Energy Behaviours. (2010) 38 *Energy Policy* 6120-6129.

Stirling A 'Limits to the Value of External Costs.' (1997) 25 *Energy Policy* 517-540.

Stirling A 'Valuing the Environmental Impacts of Electricity Production: A Critical Review of Some 'First-Generation' Studies.' (1998) 20 *Energy Sources* 267-300.

Stocker TF *et al* 'Climate Change 2013. The Physical Science Basis' Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Switzerland, 2013).

Stoett P 'Toward Renewed Legitimacy? Nuclear Power, Global Warming, and Security. (2003) 3 *Global Environmental Politics* 99-116.

Stout III, Heinberg R, Clapp RW, *et al* 'Full Cost Accounting for the Life Cycle of Coal.' (2011) 1219 *Annals of the New York Academy of Sciences* 73-98.

Szewczuk S 'Review of the wind energy activities in South Africa.' in *Green Building Handbook, South Africa.* Vol. 6 The Essential Guide (2014) 228-248.

Thomas S 'Economics of nuclear energy.' (2012) 64 *Focus: The Journal of the Helen Suzman Foundation* 49-54.

Thomas S 'The Pebble Bed Modular Reactor: An Obituary.'(2011) 39 *Energy Policy* 2431-2440.

Tomain JP 'Electricity Restructuring: A Case Study in Government Regulation.' (1997) *Tulsa LJ* 827.

Tully SR 'The Contribution of Human Rights to Universal Energy Access' (2006) 4 *Northwestern Univ J Int Hum Rts* 518, 525-526.

Tyler E 'Aligning South African Energy and Climate Change Mitigation Policy.' (2010) 10 *Climate Policy* 575-588.

Unruh GC 'Understanding Carbon Lock-In.' (2000) 28 *Energy Policy* 817-830.

Van der Horst D 'NIMBY or Not? Exploring the Relevance of Location and The Politics of Voiced Opinions in Renewable Energy Siting Controversies.' (2007) 35 *Energy Policy* 2705-2714.

van Horen C & Eberhard A 'Energy, Environment and the Rural Poor in South Africa.' (1995) 12 *Development Southern Africa* 197-211.

Van Horen C, Eberhard A, Trollip H & Thorne S 'Energy, Environment and Urban Poverty in South Africa.' (1993) 21 *Energy Policy* 623-39.

Venables M 'Fit for Purpose? Feed in Tariffs Come Under Scrutiny.' (2011) 6 *Engineering & Technology* 18-19.

Verbruggen A 'Renewable and Nuclear Power: A Common Future?' (2008) 36 *Energy Policy* 4036-4047.

Verbruggen A *et al* 'Renewable Energy Costs, Potentials, Barriers: Conceptual Issues. (2010) 38 *Energy Policy* 850-861.

Walwyn DR & Brent AC 'Renewable Energy Gathers Steam in South Africa. (2015) 41 *Renewable and Sustainable Energy Reviews* 390-401.

Weidou Ni & Johansson TB 'Energy for Sustainable Development in China.' (2004) 32 *Energy Policy* 1225-1229.

Weiss EB 'In Fairness to Future Generations.' (1990) 32 *Environment: Science and Policy for Sustainable Development* 6-31.

Weiss EB 'Our Rights and Obligations to Future Generations for the Environment.' (1990) 84 *American Journal of International Law* 198-207.

Wildermuth AJ 'Is Environmental Law a Barrier to Emerging Alternative Energy Sources.' (2009) 46 *Idaho L. Rev.* 509.

Wildermuth AJ 'The Next Step: The Integration of Energy Law and Environmental Law.' (2011) 31 *Utah Envtl. L. Rev.* 369.

Winkler H 'Energy Policies for Sustainable Development in South Africa.' (2007) 11 *Energy for Sustainable Development* 26-34.

Winkler H 'Renewable Energy Policy in South Africa: Policy Options for Renewable Electricity.' (2005) 33 *Energy Policy* 27-38.

Winkler H & Marquand A 'Changing Development Paths: From an Energy-Intensive to Low-Carbon Economy in South Africa.' (2009) 1 *Climate and Development* 47-65.

Winkler H & Marquard A 'Analysis of The Economic Implications of a Carbon Tax.' (2011) 22 *JESA* 55.

Winkler W 'Renewable Energy Policy in South Africa: Policy Options for Renewable Electricity' (2005) 33 *Energy Policy* 27-38.

Woo CK 'What Went Wrong in California's Electricity Market?' (2001) 26 *Energy* 747.

Wüstenhagen R, Wolsink M & Jean Bürer M 'Social Acceptance of Renewable Energy Innovation: An Introduction to the Concept.' (2007) 35 *Energy Policy* 2683-2691.

8.3. GOVERNMENT PUBLICATIONS

'Department of Environmental Affairs receives Eskom application for air quality standards for sixteen power stations' Media release by Department of Environmental Affairs 11 March 2014.

Draft Constitution 17th Amendment Bill B8-2009, GN 869 in GG 32311 of 17 June 2009.

Government of the Republic of South Africa, Minister of Finance, Budget Speech (26 February 2014).

Government of the Republic of South Africa, Department of Energy, 'Renewable Energy Resource Assessment in South Africa' presentation by M Modise, Sofitel Hotel, Abu Dhabi (2013) < https://irena.org/DocumentDownloads/events/2013/July/Africa%20CEC%20session%203_RSA%20Department%20of%20Energy_Modise_220613.pdf>

Government of the Republic of South Africa, Department of Energy 'Medium Term Risk Mitigation Plan (MTRM) for Electricity in South Africa 2010 to 2016 - Keeping Lights on' produced by the MTRM Project Team as an Integral Part of the Draft IRP 2 (2010).

Government of the Republic of South Africa, Department of Energy 'IPP programmes would be accelerated, and the Minister undertook to address any legislative and regulatory constraints.' <http://www.energy.gov.za/files/media/pr/2015/MediaRelease-Minister-of-Energy-Meets-with-Energy-Intensive-Users-Group-13January2015.pdf>.

Government of the Republic of South Africa, Department of Energy, Draft Second National Energy Efficiency Strategy Review GN 1000 in GG 35920 of 29 November 2012.

Government of the Republic of South Africa, Department of Energy, Draft Integrated Energy Plan for Electricity 2013. <http://www.energy.gov.za/files/policies/energyPlanning/Draft-2012-Integrated-Energy-Planning-Report-an-Executive-Summary.pdf >.

Government of the Republic of South Africa, Department of Energy, *Electricity Pricing Policy(EPP) of the South African Electricity Supply Industry* GN 1398 in GG 31741 of 19 December 2008.

Government of the Republic of South Africa, Department of Energy, REIPPPP Projects Status Report, Department of Energy (June 2014) <http://www.energy.gov.za/IPP/Electricity-Infrastructure-Industry-Transformation-30June2014.pdf >.

Government of the Republic of South Africa, Department of Environmental Affairs and Tourism 'Country Report to the 14th Session of the UNCSD' (September 2005). <http://www.info.gov.za/view/DownloadFileAction?id=175916>.

Government of the Republic of South Africa, Department of Environmental Affairs and Tourism, Guideline on Environmental Impact Assessment for Facilities to be included in the Electricity Response Plan GN 162 of 2012 GG 3290 24 February 2010.
<https://www.environment.gov.za/sites/default/files/gazetted_notices/nema_guidelinesonenvironmentalimpact_g32970gen162.pdf >.

Government of the Republic of South Africa, Department of Environmental Affairs and Tourism, White Paper on Integrated Pollution and Waste Management for South Africa – A Policy on Pollution Prevention, Waste Minimisation, Impact Management and Remediation, GN 227 in GG 20978 of 17 March 2000.

Government of the Republic of South Africa, Department of Environmental Affairs, Draft National Renewable Energy Guideline (2013) < https://www.environment.gov.za/sites/default/files/legislations/eiaguidelinerenewable_energyprojects2014.pdf >

Government of the Republic of South Africa, Departments of Environmental Affairs; Science and Technology & Trade and Industry, Green Economy Summit Report, May 2010, 8 (Green Economy Summit Report).
<https://www.environment.gov.za/greeneconomysummit/docs/summitreport.pdf >

Government of the Republic of South Africa, Joint presentation by the departments of Minerals, Environmental and Water Affairs to the Mining Portfolio Committee (10 September 2013)
<http://www.pmg.org.za/report/20130911-mine-environmental-management-briefing-departments-environmental-affairs-and-minerals>.

Government of the Republic of South Africa, Departments of Environmental Affairs, National Climate Change Response White Paper (Climate Change White Paper) GN 757 in GG 34695 of 19 October 2011.

Government of the Republic of South Africa, Departments of Environmental Affairs, Draft EIA Guideline for Renewable Energy Projects (GN 777 in GG No. 37984 of 8 September 2014).

Government of the Republic of South Africa, Department of Minerals and Energy, South Africa 'Energy Efficiency Strategy of the Republic of South Africa' March 2005
< http://www.energy.gov.za/files/esources/electricity/ee_strategy_05.pdf>

Government of the Republic of South Africa, Department of Minerals and Energy, Electricity Basic Support Services Tariff (Free Basic Electricity) Policy, Pretoria (2003).

Government of the Republic of South Africa, Department of Energy and Mineral Resources, *Guidelines for Free Basic Electricity* (2003).

Government of the Republic of South Africa, Department of Minerals and Energy 'Free Basic Alternative Energy Policy (Household Energy Support Programme)' GN 391 in GG 29760 of 2 April 2007

Government of the Republic of South Africa, Department of Minerals and Energy 'National Energy Efficiency Strategy of the Republic of South Africa' (First review 2008) GN 908 in GG 32342 of 26 June 2009.

Government of the Republic of South Africa, Department of Minerals and Energy, South Africa, Electricity Distribution Industry Blueprint Report: Reform of the Electricity Distribution Industry in South Africa: Strategy and Blueprint, Department of Minerals and Energy, Pretoria (2001) (Revised version of October 2000).

Government of the Republic of South Africa, Department of Minerals and Energy, White Paper on the Energy Policy of the Republic of South Africa (1998) (GN 3007 in GG 19606 of 17 December 1998.

Government of the Republic of South Africa, Department of Minerals and Energy, White Paper on the Renewable Energy Policy of the Republic of South Africa GN 513 in GG 26169 of 14 May 2004.

Government of the Republic of South Africa, Department of Mineral Resources 'Investigation of Hydraulic Fracturing: Report of the Working Group' (July 2012).

Government of the Republic of South Africa, Department of National Treasury 'Reducing Greenhouse Gas Emissions and Facilitating the Transition to a Green Economy: Carbon Tax Policy Paper' (2013).

Government of the Republic of South Africa, Department of National Treasury 'Reducing Greenhouse Gas Emissions: The Carbon Tax Option', discussion document for public comment (December 2010).

Government of the Republic of South Africa, National Treasury, 'Reducing Greenhouse Gas Emissions and Facilitating the Transition to a Green Economy' Draft Carbon Tax Policy Paper for Public Comment, May 2013.
< http://www.treasury.gov.za/public comments/Carbon Tax Policy Paper 2013.pdf >

Government of the Republic of South Africa, Department of Public Enterprises 'South African Government's Response to Questions on the Eskom Loan Application to the World Bank' <http://www.dpe.gov.za/newsroom/Pages/South-African-Government%E2%80%99s-Response-to-Questions-on-the-Eskom-loan-application-to-the-World-Bank.aspx >.

Government of the Republic of South Africa, Department of Trade and Industry, South Africa, Industrial Policy Action Plan Economic Sectors and Employment Cluster IPAP2013/14 – 2015/16 (2013) < http://www.thedti.gov.za/news2013/ipap_2013-2016.pdf >.

Government of the Republic of South Africa, Draft Second National Energy Efficiency Strategy Review GN 1000 in GG 35920 of 29 November 2012.

Government of the Republic of South Africa, Dti, Beneficiation Strategy for Minerals industry in South Africa (2011) <http://www.gov.za/documents/beneficiation-strategy-minerals-industry-south-africa >.

Government of the Republic of South Africa, Free Basic Alternative Energy Policy (Households Energy Support programme) GN 391 in GG 29760 of 2 April 2007. <http://www.energy.gov.za/files/policies/Free%20Basic%20Alternative%20Energy%20Policy%202007.pdf >

Government of the Republic of South Africa, National Planning Commission, National Development Plan-Making it Work 2030 (2011). <http://www.npconline.co.za/pebble.asp?relid=25>.

National Energy Regulator of South Africa, Renewable Energy Feed-In Tariff (REFIT) Guidelines (March 2009) <http://www.nersa.org.za/UploadedFiles/ElectricityDocuments/REFIT%20Guidelines.pdf >

National Energy Regulator of South Africa, Consultation Paper 'Revision of Regulatory Rules for Energy Efficiency and Demand Side Management (EEDSM) including Standard Offer Programme (SOP)' (June 2010).

National Energy Regulator of South Africa, Consultation Paper on Renewable Energy Feed-In Tariff – Phase 2 (July 2009) <http://www.nersa.org.za/SectionsDocuments.aspx?Section=3&Doc=15>

National Energy regulator of South Africa, 'Multi-Year Price Determination (MYPD) Methodology' (2012) read with Eskom 'Multi Year Price Determination 3 (MYPD3) 2013/2014-2017/2018.'

8.4. TREATIES, REPORTS AND THESIS

Act implementing Directive 2001/77/EC of the European Parliament and of the Council of 27 September 2001 on the promotion of electricity produced from renewable energy sources in the internal electricity market (OJ L 283, 33), as last amended by Directive 2006/108/EC of the Council of 20 November 2006 (OJ L 363, 414).

Alleyne TSG & Hussain M *Energy Subsidy Reform in Sub-Saharan Africa: Experiences and Lessons*. International Monetary Fund, 2013.

Bowen A '"Green" Growth "Green" Jobs and Labor Markets.' *World Bank Policy Research Working Paper* No 5990 (2012).

BP Shell, *Environmental Management Plan South Western Karoo Basin Gas Exploration Application: Western Precinct Shell Exploration Company BV* Vol. 1, PASA Reference No 12/3/219.

Cargill JG 'The Role of Market-Based Instruments that Use Existing Markets to Promote Energy Efficiency in South African Industry' Dissertation submitted in partial fulfilment of the requirements of MPhil degree, at the University of Cape Town (2011).

Cosbey A 'Trade, Sustainable Development And A Green Economy: Benefits, Challenges And Risks.' in *The Transition to a Green Economy: Benefits, Challenges and Risks from a Sustainable Development Perspective* Report by a Panel of Experts to Second Preparatory Committee Meeting for United Nations Conference on Sustainable Development (UNEP, UNCTAD; 2011) 40-61.

Danish Energy Association *Danish Electricity Supply, Statistics* 2001,

Du Toit L 'Promoting Renewable Energy in South Africa Through the Inclusion of Market-based Instruments in South Africa's Legal and Policy Framework with Particular Reference to the Feed-in Tariff.' Thesis presented for the degree of PhD at the University of Cape Town (2014).

Hartmann D *et al* 'Observations: Atmosphere and Surface' in Stocker TF *et al* Climate Change 2013: The Physical Science Basis Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (2013) 167.

Havemann L, Glazewski J & Brownlie S 'Critical Review of the Application for a Karoo Gas Exploration Right by Shell Exploration Company BV' (5 April 2011).

Holton CJ 'What are the Effects of Fossil-Fuel Subsidies on Growth, The

Environment and Inequality?' Dissertation presented at the School of Economics (University of Nottingham 2012).

The Energy Challenge for Achieving the Millennium Development Goals, UN Energy Paper June 2005, 3 <http://www.un-energy.org/sites/default/files/share/une/un-enrg_paper.pdf>

Energy for a Sustainable Future, The UN Secretary-General's Advisory Group on Energy and Climate Change (AGECC 2010).

Eskom Holdings SOC Limited (December 2013) *Standard Presentation* 40 <http://www.eskom.co.za/OurCompany/Investors/Presentations/Documents/EskomStandardPresentationDec2013.pdf >.

Eskom's *Status Report on Capacity Expansion Project* <http://www.eskom.co.za/live/content.php?Item_ID=9598>

Eskom for Environmental Impact Assessment Reports on Nuclear 1 <http://www.eskom.co.za/live/content.php?Category_ID=77>

Eskom, Wind Energy Facility in the Western Cape <http://www.eskom.co.za/live/content.php?Item_ID=4528#bid>.

Eskom Revenue Application: Multi-Year Price Determination 2013/14 to 2017/18 (MYPD 3) (2012).

FAO 'The Water-Energy-Food Nexus: A New Approach in Support of Food Security and Sustainable Agriculture' Food and Agriculture Organization of the United Nations (FAO) (Rome, 2014) <http://www.fao.org/nr/water/docs/fao_nexus_concept_web.pdf>.

Fischer-Kowalski M & Swilling M 'Decoupling: natural resource use and environmental impacts from economic growth.' (2011) *United Nations Environment Programme* (UNEP).

Goldemberg J, Johansson TB & Anderson D *World Energy Assessment, Update 2004.* United Nations Development Programme, Bureau for Development Policy, (2004) <http://www.undp.org/energy/weaover2004.htm>.

Graichen P & Redl C 'The German Energiewende and its climate paradox. An analysis of power sector trends for renewables, coal, gas, nuclear power and CO2 emissions 2010–2030.' *Analysis No. April 2014* (2014).

Grobbelaar IC 'The Privatisation of the Electricity Industry in South Africa' thesis submitted for the Degree of BSc (Hons) (Quantity Surveying) (2011).

Hallowes D 'The World Bank and Eskom: Banking on Climate Destruction!' Groundwork (2009).

Hartmann D *et al* 'Observations: Atmosphere and Surface' in TF Stocker *et al Climate Change 2013: The Physical Science Basis Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (2013).

Haw M & Hughes H 'Clean Energy and Development for South Africa: Background Data' (28 February 2007) <http://www.erc.uct.ac.za/Research/Publications-recent.htm>.

Houghton JT *et al* 'Climate Change 1995: The Science of Climate Change: Contribution of Working Group I' (1996) *Second Assessment Report of the Intergovernmental Panel on Climate Change* 13.

IISD Achieving the G-20 Call to Phase Out Subsidies to Fossil Fuels, Global Subsidies Initiative, Policy Brief (IISD October 2009)

International Energy Agency (IEA) *World Energy Outlook 2014 - Executive Summary* (WEO-2014) 4.

IEA Tracking Clean Energy Progress, IEA Input to the Clean Energy Ministerial, OECD/IEA (2013).

International Energy Agency (IEA) 'The Impact of Global Coal Supply on Worldwide Electricity Prices: Overview and comparison between Europe, the United States, Australia, Japan, China and South Africa' Report by the IEA Coal Industry Advisory Board (2014).

International Renewable Energy Agency (IRENA) 'Roundtable for Sustainable Biofuels (RSB)' <http://cgse.epfl.ch/page79935.html>

International Renewable Energy Agency (IRENA), Africa's Renewable Future: The Path to Sustainable Growth, Abu Dhabi (2013) 19 < http://www.irena.org/documentdownloads/publications/africa_renewable_future.pdf>

International Renewable Energy Agency (IRENA) 'Africa 2030: Roadmap for a Renewable Energy Future.' (IRENA, 2015) Abu Dhabi.

Kim JA 'Sustainable development and the CDM: A South African case study' Tyndall Centre for Climate Change Research, Working Paper 42 (2003)

Kirkman KP 'Strategic review of the coal mining industry with regard to grassland biodiversity and identification of opportunities for the development of

interventions with the coal mining industry to address biodiversity' *Background Information Report No. 4* (SANBI, 2006).

Klugman J *Human Development Report 2010: The Real Wealth of Nations: Pathways to Human Development* (2010).

Kugel L 'Review of the Regulatory Framework for Electricity Generation and Distribution in Southern Arica' USAID (2007).

Lang K, Wooders P & Kulovesi K 'Increasing the Momentum of Fossil-Fuel Subsidy Reform: A Roadmap for International Cooperation' (2010) IISD.

Malik K *et al Human Development Report 2013, The Rise of the South: Human Progress in a Diverse World* (2013).

McElhinny V 'New World - Same World Bank' *IFI Info Brief* (2010).

Miketa A & Merven B 'Southern African Power Pool: Planning and Prospects for Renewable Energy' (2013). <https://www.irena.org/DocumentDownloads/Publications/SAPP.pdf>.

Müller O *et al* 'Renewable Energy: Policy Considerations for Deploying Renewables' OECD/IEA 2011.

National Academy of Sciences 'Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use' Committee on Health, Environmental, and Other External Costs and Benefits of Energy Production and Consumption (2010).

Nganga J, Wohlert W & Woods M 'Powering Africa through Feed-in Tariffs: Advancing renewable energy to meet the continent's electricity needs' A Study for the World Future Council (WFC), the Heinrich Böll Stiftung (HBS) and Friends of the Earth England, Wales & Northern Ireland (FoE-EWNI) (2013).

OECD/IEA 'Energy Poverty: How to make Energy Access Universal' Special early excerpt of the *World Energy Outlook 2010* for the UN General Assembly on the Millennium Development Goals (2010).

Parry ML *et al*, Intergovernmental Panel on Climate Change, Climate Change 2007: Impacts, Adaptation and Vulnerability – Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (2007).

Report on 'Energy for Sustainable Development', African Regional Implementation Review for the 14th Session of the Commission on Sustainable Development (CSD-14), prepared by the Economic Commission for Africa (UNECA) on behalf of the Joint Secretariat UNECA, UNEP, UNIDO, UNDP, ADB and NEPAD Secretariat.

Rogerson C 'Ekurhuleni: Towards a local industrial policy for driving pro-poor growth and a people-centred economy' Case Study prepared for the World Bank-Netherlands Partnership Program *Evaluating and Disseminating Experiences in Local Economic Development (LED)* Investigation of Pro-Poor LED in South Africa, 2005.

Sampa R & Kordunsky A 'Technical Report: Role of Regulators in Promoting Clean Energy' (2011) *AECOM International Development for USAID* 10 <http://www.satradehub.org/home/role-of-regulators-in-promoting-clean-energy/callelement>.

SADC Protocol on Energy <http://www.sadc.int/index/browse/page/147>

Secretary-General's Advisory Group on Energy and Climate Change (AGECC) (2010); Johannesburg Plan of Implementation (2002).

Solomon S *et al* (eds) *Climate Change 2007 – The Physical Science Basis Contribution of Working Group I to the Fourth Assessment Report of the IPCC* (2007).

Stern N *The Stern Review: The Economics of Climate Change* (2006).

The Energy Challenge for Achieving the Millennium Development Goals, UN Energy Paper (June 2005) <http://www.un-energy.org/sites/default/files/share/une/un-enrg_paper.pdf>.

UN Convention on Biological Diversity (1992).

UN Desertification Convention (1992).

UN Framework Convention on Climate Change (1992).

UN Conference on New and Renewable Sources of Energy in Nairobi, see Art II of the *A/RES/36/193* of 17 December 1981 and *A/RES/37/250* of 21 December 1982 on the immediate implementation of the Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy.

UN Dept. of Economic and Social Affairs, Commission on Sustainable Development. 2007, *Industrial development for the 21st Century: Sustainable Development Perspectives.* (United Nations, New York: 2007).

UN Energy 'The Energy Challenge for Achieving The Millennium Development Goals' (2005) *New York* 6-7.

UN Energy for Sustainable Development, Report of CSD 14 (2006).

UN ENERGY/Africa publication to CSD 15, *Energy for Sustainable Development: Policy Options for Africa*, 32.

UN Environment Programme and UN Economic Commission for Africa Making Africa's Power Sector Sustainable: An Analysis of Power Sector Reforms in Africa (2007); UN ENERGY/Africa publication to CSD 15, Energy for Sustainable Development: Policy Options for Africa, 32.

UN General Assembly Resolution 60/199 (2006) on Promotion of New and Renewable Sources of Energy, including the implementation of the World Solar Programme A/RES/60/199.

UNDP 'World Energy Assessment: Energy and the Challenge of Sustainability' (2000) 439
<http://www.undp.org/energy/activities/wea/drafts-frame.html>

UNEP and United Nations Economic Commission for Africa, Making Africa's Power Sector Sustainable: An Analysis of Power Sector Reforms in Africa. Addis Ababa: United Nations Economic Commission for Africa : United Nations Environment Programme, 2007.

UNEP/WMO- Watson RT, Zinyowera MC & Moss RH 'Technologies, policies and measures for mitigating climate change' (WMO/UNEP, 1996).

UNGA 6th Session Resolution on 'Promotion of New and Renewable Sources of Energy, Including the Implementation of the World Solar Programme' Resolution *A/RES/60/199* (13 March 2006).

United Nations Conference on New and Renewable Sources of Energy in Nairobi, see Art II of the A/RES/36/193 of 17 December 1981 and A/RES/37/250 of 21 December 1982 on the Immediate implementation of the Nairobi Programme of Action for the Development and Utilization of New and Renewable Sources of Energy.

Wassung N 'Water Scarcity And Electricity Generation In South Africa' thesis in partial fulfilment of the requirements for the MPhil in Sustainable Development, University of Stellenbosch (2010)
< http://hdl.handle.net/10019.1/18158 >

Winkler H 'Cleaner energy cooler climate: developing sustainable energy solutions for South Africa.' (UCT 2015)

World Energy Council 'World Energy Trilemma: Time to get Real - The case for sustainable energy policy' (2012).

World Energy Council 'World Energy Trilemma: Time to get Real - The case for sustainable energy investment' (2013).

World Commission on Environment and Development *Our Common Future* (1987).

UNDP 'Human Development Report (HDR) 2010: Fighting Climate Change – Human Solidarity in a Divided World' (2007/2008).

8.5. INTERNET & OTHER MEDIA ARTICLES

'Achieving the G-20 call to Phase out Subsidies to Fossil Fuels' *Global Subsidies Initiative Policy Brief* (October 2009).

Adam 'Comments on the IEP' (Greenpeace, South Africa 2013.

Agency Staff 'Energy a 'Challenge', Not a Crisis, says Zuma' *BusinessDay* (13 February 2015). <http://www.bdlive.co.za/business/energy/2015/02/13/energy-a-challenge-not-a-crisis-says-zuma>

M lix M 'Green Economy "will create jobs"' *BusinessDay* (28 November 2012) <http://www.bdlive.co.za/economy/2012/11/28/green-economy-will-create-jobs>.

Altbeker A, Storme E & Bernstein A *Growth in a Time of Uncertainty: Does South Africa Have a Growth Plan?* CDE Edited proceedings of a Round Table convened by the Centre for Development and Enterprise, Number 23, December 2013, 53 <http://www.cde.org.za/publications/jobs-growth/83-jobs-and-growth/425-growth-in-a-time-of-uncertainty-does-south-africa-have-a-growth-plan >.

Aronson J et al 'South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities' 1st ed (2014) *Endangered Wildlife Trust (EWT) Report.*

Barron C 'A Crisis for SA, but not for Eskom, says Matona' *Business Day* (14 December 2014.

Bekker F 'Review of the Draft EMP in Support of an Application for Gas Exploration in the Western Karoo (Central Precinct) by Shell Exploration Company' (1 April 2011) <http://www.azef.co.za/pdf/shellgasreview.pdf>.

< http://www.treasury.gov.za/divisions/tfsie/tax/CarbontaxWorkshop/NERSA.pdf

Blaine S 'Eskom says some power stations still do not pass air-quality tests' *BusinessDay* (3 April 2014) <http://www.bdlive.co.za/national/science/2014/04/03/eskom-says-some-power-stations-still-do-not-pass-air-quality-tests >.

Blaine S 'Firms 'Abusing law' on Air Quality Standards Compliance' *Business Day* (3 April 2014) <http://www.bdlive.co.za/national/science/2014/04/03/firms-abusing-law-on-air-quality-standards-compliance >.

Blignaut J *et al* 'The External Cost of Coal-Fired Power Generation: The Case

of Kusile' (29 September 2011) 5-6. <http://www.greenpeace.org/africa/Global/africa/publications/coal/FULL%20SCIENTIFIC%20PAPER%20139%20pages.pdf>.

Blandy F 'Dark Days Ahead for Energy-strapped SA' *Mail & Guardian* (12 December 2007) <http://mg.co.za/article/2007-12-12-dark-days-ahead-for-energystrapped-sa >.

Bukula T 'NERSA Comments on Carbon Tax Discussion Paper' Presented to National Treasury, 16 March 2011, 7.

Cassim R & Jackson W 'Sustainable Development: The Case of Energy in South Africa' *Trade and Industrial Policy Strategies (TIPS)* (2004).

Centre for Development and Enterprise (CDE), *South Africa's Electricity Crisis: How Did We Get Here? And How Do We Put Things Right?* CDE Round Table no 10, July 2008.

Centre for Environmental Rights, Casewatch <http://cer.org.za/programmes/pollution-climate-change/legal-proceedings >

Centre for Environmental Rights (CER) comments on Draft Mineral and Petroleum Resources Development Amendment Bill 2012 (on file with author).

'Comments on the Carbon Tax Policy Paper issued by National Treasury in May 2013' Energy Research Centre, University of Cape Town, submitted September 2013

Community Organisers' Toolbox 'Understanding Government' <http://www.etu.org.za/toolbox/docs/govern/policy.html>.

'Contaminated Coal Waste' Natural Resources Defence Council (NRDC), 3 December 2009 <http://www.nrdc.org/energy/coalwaste>.

Creamer T 'SADC reaffirms Inga as a regional project, Westcor may be expanded' *Engineering News* (11 September 2009).

Creamer T 'Several Cities Publish Schedules, but Eskom Says There is No Immediate Load-Shedding Plan' *Engineering News* (3 June 2013).

Davies M 'We Don't Need Kusile Power Plant in South Africa: Here's Why...' <http://www.greenpeace.org/africa/en/News/Blog/we-dont-need-kusile-power-plant-in-south-afri/blog/37646 >.

Deloitte 'Demystifying Tariff Setting – the tariff Conundrum – Lower Rates now, Blackouts Later?' (2013) 4

<http://www.deloitte.com/assets/DcomSouthAfrica/Local%20Assets/Documents/Demystifying_Tariff_Setting.pdf >.

Devine-Wright P 'Reconsidering Public Attitudes and Public Acceptance of Renewable Energy Technologies: A Critical Review.' Manchester: School of Environment and Development, University of Manchester. Available at: <http://geography.exeter.ac.uk/beyond_nimbyism/deliverables/bn_wp1_4.pdf >.

De Wet P 'Eskom Power Price Hikes Deferred, Rather than Denied' Mail & Guardian (9 March 2012) <http://mg.co.za/article/2012-03-09-Eskom-power-price-hikes-deferred-rather-than-denied>.

Donnelly L 'Blackout Alert' Mail & Guardian (8 October 2010).

Dowes G 'National Treasury's Discussion Paper On Reducing Greenhouse Gas Emissions "The Carbon Tax Option" ' comments on National Treasury Carbon Tax Policy Paper by Eskom. (2011) <http://www.treasury.gov.za/divisions/tfsie/tax/CarbontaxWorkshop/Eskom.pdf >

Earthlife Africa ''Draft IEP Report' (2013)

Edkins M, Winkler H & Marquard A 'Large-scale Rollout of Concentrating Solar Power in South Africa' (August 2009) <http://www.erc.uct.ac.za/Research/publications/09Edkins-etal Rollout_of_CSP.pdf>.

Edkins M, Winkler H & Marquard A 'South Africa's renewable energy policy roadmaps' For the United Nations Environment Programme Research Project *Enhancing information for renewable energy technology deployment in Brazil, China and South Africa (2010)*

Eilperin J 'World's Power Plant Emissions Detailed' <http://www.washingtonpost.com/wpdyn/content/article/2007/11/14/AR2007111402010.html>

Faull L 'Exposed: Scary Details of SA's Secret Russian Nuke Deal' *Mail & Guardian* (13 February 2015) < http://mg.co.za/article/2015-02-12-exposed-scary-details-of-secret-russian-nuke-deal >.

Faull L, Sole S & Brümmer S 'What the SA-Russia Nuke Agreement says – and Means' *Mail & Guardian* (13 February 2015) <http://mg.co.za/article/2015-02-12-what-the-sa-russia-nuke-agreement-says-and-means >.

'Final Environmental Impact Assessment for the Proposed Bokamoso

Photovoltaic Solar Energy Facility near Leeudoringstad, Registration Division HP, North West Province.' Department of Environmental Affairs Ref No:14/12/16/3/3/2/559 Environamics, (2014) <http://www.sahra.org.za/sites/default/files/additionaldocs/Bokamoso%20%20Final%20EIR%20(Final).pdf >.

'Environmental Impact Assessment Process Draft Environmental Impact Report Proposed Castle Wind Energy Facility near De Aar, Northern Cape Province, Department of Environmental Affairs Ref No: 14/12/16/3/3/2/278 Savannah (2014), <http://savannahsa.com/documents/5408/Castle%20Wind%20Energy%20Facility%20-%20Draft%20EIA%20Report%20(protected).pdf >.

Flavin C & Hull Aeck M 'The Potential Role of Renewable Energy in Meeting the Millennium Development Goals' REN21 Network, The World Watch Institute (2005).

Goga S & Pegram G 'Water, Energy and Food: A Review of Integrated Planning in South Africa' WWF Report 2014.

Groenewald Y 'Coal's hidden water cost to South Africa' (study commissioned by Greenpeace Africa, 2012). <http://www.greenpeace.org/africa/Global/africa/publications/coal/CoalsHiddenWaterCost.pdf >

Groenewald Y 'Mapungubwe Mining Licences: Who Will Look After Water?'' *Miningm*^{x} (19 March 2012).

'Green Groups Challenge Eskom Plans' *LegalBrief Environmental* 0134 (20 October 2009) 1.

Hallowes D 'The World Bank and Eskom: Banking on Climate Destruction!' (2009) Groundwork.

Hancock T 'Two 75 MW PV Projects Come on Stream in SA' *Engineering News* <http://www.engineeringnews.co.za/article/two-75-mw-pv-projects-come-on-stream-in-sa-2014-05-28>.

Hancock T 'Wind Energy Gathering Momentum, Hopefield Farm Fully Operational' *Engineering News* <http://www.engineeringnews.co.za/article/wind-energy-gathering-momentum-hopefield-farm-fully-operational-2014-05-16 >.

Haw M & Hughes H 'Clean Energy and Development for South Africa: Background Data' (28 February 2007) <http://www.erc.uct.ac.za/Research/Publications-recent.htm>.

Hunter Q ‘At the Heart of Eskom’s Darkness’ *Mail & Guardian* (16 January 2015).

International Energy Agency (IEA) World Energy Outlook 2014 – Executive Summary (WEO-2014) 4
< http://www.iea.org/Textbase/npsum/WEO2014SUM.pdf >.

Isaacs D ‘Constitution 17th Amendment Bill - Good or Bad?’ *Politicsweb* (30 June 2009).
<http://www.politicsweb.co.za/politicsweb/view/politicsweb/en/page72308?oid=134659&sn=Marketingweb%20detail >

LegalBrief Environmental 0134 Green groups

Letete T, Guma M & Marquard A ‘Information on Climate Change in South Africa: Greenhouse Gas Emissions and Mitigation Options’ Energy Research Centre (2009)
<http://www.erc.uct.ac.za/Information/Climate%20change/Climate_change_info-complete.pdf >.

Maqutu A ‘Solar water heater rebate uncertainty’ *BusinessDay* (Johannesburg) 11 April 2014. < http://www.bdlive.co.za/national/science/2014/04/11/solar-water-heater-rebate-uncertainty >

Mckechnie A ‘A Darker Shade of Green: Birds and Wind Farms ’ *Birding briefs,* August/September 2008
< http://www.fitzpatrick.uct.ac.za/africa_birds/ABB13(4)16-17.pdf >.

Miketa A & Merven B ‘Southern African Power Pool: Planning and Prospects for Renewable Energy’ (2013) 37
<https://www.irena.org/DocumentDownloads/Publications/SAPP.pdf>.

MIT Coal Energy Study Advisory Committee *The Future of Coal: Options for a Carbon-Constrained World* (2007)
<http://web.mit.edu/coal/The_Future_of_Coal.pdf >

Moodley S ‘Municipalities’ R4bn debt to Eskom Hindering Electricity Supply’ *Engineering News* (22 January 2015).

Morgan G ‘State Must do More to Manage Mining's Environmental Effects’ *Business Day* (17 January 2012).

Mungadze S ‘Motlanthe Backs Nuclear Power Plants as Expert Wavers’ *Business Day* (19 March 2013).

Njobeni S 'Eskom Sizes up $1bn Loan for Clean Power' *BusinessDay* (15 October 2010).

OECD/IEA 'Energy Poverty: How to Make Energy Access Universal, Special early excerpt of the World Energy Outlook 2010 for the UN General Assembly on the Millennium Development Goals (2010) 15 available at: <http://www.worldenergyoutlook.org/media/weowebsite/2010/weo2010_poverty.pdf>.

Park C *A Dictionary of Environment and Conservation* (2007) *Oxford Reference Online* (1 October 2010) <http://www.oxfordreference.com/views/ENTRY.html?subview=Main&entry=t244.e6826>.

'Power Plant Waste' Greenpeace International, 15 April 2010

<http://www.greenpeace.org/international/en/campaigns/climatechange/coal/Power-plant-waste>

'SA Rises in the Ranks of Polluters' (15 November 2007). <http://it-online.co.za/content/view/175330/142 >.

Samba R 'To REFIT or not to REFIT' (2009) *Hub Digest* <http://www.satradehub.org/clean-energy/sath-content/newsroom/hub-happenings-articles/hub-digest-to-refit-or-not-to-refit>

'South Africa's Energy Crisis: Eskom 2008-2015' Financial Mail (19 March 2015) <http://cdn.bdlive.co.za/ebooks/Eskom%20and%20the%20SA%20energy%20crisis.pdf >.

Speech by the Minister of Energy, Ms Dipuo Peters, MP, on the occasion of the Youth Round-Table on Nuclear Energy (13 June 2013) <http://www.energy.gov.za/files/media/speeches/2013/SpeechByMinister-YouthRoundTableOnNuclear-13June2013.pdf >.

Sumayya G & Pegram G 'Water, Energy and Food: A Review of Integrated Planning in South Africa' WWF Report 2014.

Swanepoel E 'CoAL's Vele Project Raises Environmental Concerns' *Mining Weekly* (20 February 2009) <http://www.miningweekly.com/article/coals-vele-project-raises-environmental-concerns-2009-02-20>.

Szewczuk S 'Review of the Strategic Wind Energy Activities in South Africa. In *Industrial and Commercial Use of Energy Conference (ICUE), 2012 Proceedings of the 9th* (pp. 1-8). IEEE. (2014).

Van der Nest G 'The economic consequences of load shedding in South Africa and the state of the electrical grid' TRALAC, 2015 < https://www.tralac.org/discussions/article/7000-the-economic-consequences-of-load-shedding-in-south-africa-and-the-state-of-the-electrical-grid.html>

Vecchiatto P 'Peters Sings Praises of Nuclear Energy' *BusinessDay* (14 May 2013).

Vecchiatto P 'Molewa Lays Down Law for Sasol and Eskom' *BusinessDay* (29 October 2014) <http://www.bdlive.co.za/national/science/2014/10/29/molewa-lays-down-law-for-sasol-and-eskom >.

Wait M 'IPP Programmes on Track – Eskom' *Engineering News* <*http://www.engineeringnews.co.za/article/ipp-programmes-on-track-eskom-2014-05-16 >.*

'Why Stop Producing Carbon' *Mail & Guardian* (4 November 2010).

World Wide Fund for Nature (WWF) '50% by 2030: Renewable Energy in a Just Transition to Sustainable Electricity Supply' Energy Review (2010).

Yelland C 'Analysis: Electricity Problems Converge as Eskom CEO Departs' *Daily Mavericks* (2 April 2014) <http://www.dailymaverick.co.za/article/2014-04-01-analysis-electricity-problems-converge-as-eskom-ceo-departs/#.VOZmuXbj_LU >

9. TABLE OF CASES

Agri SA v Minister for Minerals and Energy 2013 (4) SA 1 (CC).

Barberton Mines (Pty) Ltd v Mpumalanga Tourism and Parks Agency & others Case no 43125/13 (North Gauteng High Court (12 July 2013)

Bareki NO v Gencor Ltd and Others [2006] 2 All SA 392 (T).

Bengwenyama Minerals (Pty) Ltd and others v Genorah Resources (Pty) Ltd and others 2011 (4) SA 113 (CC).

Benwenyama-ya-Maswazi Community and others v Minister for Mineral Resources and others 2015 (1) SA 197 (SCA).

BHP Billiton PLC Inc & another v De Lange & others [2013] 2 All SA 523 (SCA).

Body Corporate Croftdene Mall v Ethekwini Municipality 2012(4) SA 169 (SCA).

Boiler Efficiency Services CC v Coalcor (Cape) (Pty) Ltd & others 1989 (3) SA 460 (C).

BP Southern Africa (Pty) Ltd v MEC for Agriculture, Conservation, Environment & Land Affairs 2004 (5) SA 124 (W).

Commonwealth of Massachusetts v Alliance of Automobile Manufacturers 367 US App D.C 282; 415 F.3d 50 (2005).

Company Secretary of Arcelormittal & another v Vaal Environmental Justice Alliance [2014] JOL 32582 (SCA).

Darries & others v City of Johannesburg & others 2009 (5) SA 284 (GSJ).

De Lange and Another v Eskom Holdings Ltd and Others 2012 (1) SA 280 (GSJ).

Director: Mineral Development, Gauteng Region & another v Save the Vaal Environment & others 1999 (2) SA 709 (SCA).

Fuel Retailers Association of Southern Africa v Director-General: Environmental Management, Department of Agriculture, Conservation and Environment, Mpumalanga Province & others 2007 (6) SA 4(CC).

Government of the Republic of South Africa & others v Grootboom & others 2001 (1) SA 46 (CC)

Harmony Gold Mining Co Ltd v Regional Director, Free State Department of Water Affairs & others 2014 (3) SA 149 (SCA).

Hichange Investment (Pty) v Cape Produce Company (Pty) Ltd 2004 (2) SA 3.

HTF Developers (Pty) Ltd v Minister of Environmental Affairs 2006 (5) SA 512 (T)

Joseph & others v City of Johannesburg & others 2010 (4) SA 55 (CC).

Kebble v The Minister of Water Affairs and Forestry 2007 JDR 0872 (SCA)

Khosa & others v Minister of Social Development & others; Mahlaule & others v Minister of Social Development & others 2004 (6) SA 505 (CC) .

Landev (Pty) Ltd v Black Eagle Project, Roodekrans 2010 JDR 0355 (GSJ)*;* 6085/07 ZAGP JHC (29 March 2010).

Le Sueuer & others v Ethekwini Municipality HC Durban 2013.

Maccsand (Pty) Ltd v City of Cape Town 2012 (4) SA 181 (CC).

Massachusetts v Environmental Protection Agency 127 S. Ct. 1438; 167 L. Ed. 2d 248; 2007 US LEXIS 3785.

McDonald & others v Minister of Minerals and Energy & others 2007 (5) SA 642 (C).

MEC, Department of Agriculture, Conservation and Environment v HTF Developers (Pty) Ltd 2008 (2) SA 319 (CC).

Minister of Health and Welfare v Woodcarb (Pty) Ltd 1996 (3) SA 155 (N).

Mkontwana v Nelson Mandela Metropolitan Municipality & another; Bissett & others v Buffalo City Municipality & others; Transfer Rights Action Campaign & others v MEC, Local Government and Housing, Gauteng & others (KwaZulu-Natal Law Society and Msunduzi Municipality as Amici Curiae) 2005 (1) SA 530 (CC).

Mtunzini Conservancy v Tronox KZN Sands (Pty) Ltd & another 2013 (4) BCLR 467 (KZD); [2013] 2 All SA 69 (KZD).

S v Anker Coal SA (Pty) Ltd CASE: ESH 8 /119 (Mpumalanga) on SAKAI.

S v Golfview Mining (Pty) Ltd CASE: ESH 82/11 (Mpumalanga)

Sasol Synfuels (Pty) Ltd & others v Minister of Water and Environmental Affairs & others (High Court, Gauteng Division, Pretoria) (Case no. 36444/14 (21 June 2014).

Tergniet and Toekoms Action Group & 34 others v Outeniqua Kreosootpale (Pty) Ltd & others [2009] ZAWCHC 6

Commonwealth of Massachusetts v Alliance of Automobile Manufacturers 367 US App D.C 282; 415 F.3d 50 (2005).

Massachusetts v Environmental Protection Agency 127 S. Ct. 1438; 167 L. Ed. 2d 248; 2007 US LEXIS 3785

10. TABLE OF STATUTES AND REGULATIONS

Atmospheric Pollution Prevention Act 45 of 1965.

Baseload IPP Procurement Programme 2012, GN 1075 in GG 36005 of 19 December 2012.

Central Energy Fund Act 38 of 1997.

Conservation of Agricultural Resources Act.

Constitution of the Republic of South Africa, 1996.

IPP Procurement Programme, 2012 GN 1074 in GG 36005 of 19 December 2012, Renewable Energy Independent Power Producer Procurement Programme.

Environmental Management Framework Regulations 2010.

Electricity Act 41 of 1987.

Electricity Feed-In Law of 1991 ("Stromeinspeisungsgesetz") (Federal Republic of Germany).

Electricity Regulation Act 4 of 2006.

Electricity Regulation Second Amendment Bill GN 905 in GG 34870 of 19 December 2011.

Electricity Regulations on the Integrated Resources Plans 2010-2030 GN R400 in GG 34263 of 6 May 2011(IRP2).

Environment Conservation Act 73 of 1989.

Environmental Impact Assessment Regulations, 2014 GN R982 in *GG* 38282 of 4 December 2014.

Environmental Impact Assessment Regulations Listing Notice 1 of 2014 GN R983 in GG 38282 of 4 December 2014.

Environmental Impact Assessment Regulations Listing Notice 2 of 2014 GN R984 in GG 38282 of 4 December 2014.

Environmental Impact Assessment Regulations Listing Notice 3 of 2014 GN R985 in GG 38282 of 4 December 2014.

Environmental Impact Assessment Regulations GN R543 of 2010 GG 33306 of 18 June 2010.

Environmental Impact Assessment Regulations Listing Notice 1: List of activities and competent authorities identified in terms of sections 24 (2) and 24D GN R544 in GG 33306 of 18 June 2010.

Environmental Impact Assessment Regulations Listing Notice 3 of 2014 GN R985 of 2014 *GG* 38282 of 4 December 2014.

Environmental Impact Assessment Regulations Listing Notice Listing Notice 2: List of activities and competent authorities identified in terms of sections 24 (2) and 24DGN R545 in GG 33306 of 18 June 2010.

Environmental Impact Assessment Regulations, 2014 GN R982 of 2014 GG 38282 of 4 December 2014.

Environmental Levy on Electricity Generated in South Africa, Item 148.01 of Schedule 1 Part 3B in terms of the Customs and Excise Act, 1964.

Eskom and Coal Suppliers on coal supply security and quality of coal supplied to Eskom' Parliamentary Portfolio Committee Report (2014).

Eskom Conversion Act 13 of 2001.

Hazardous Substances Act 15 of 1973.

Independent System and Market Operator Establishment Bill 2011, GN 290 in GG 34289 of 13 May 2011.

Infrastructure Development Act 23 of 2014

Integrated Resource Plan for Electricity 2010–2030 GN R 400 in GG 34263 of 6 May 2011 (November 2013 update) (IRP2).

Intergovernmental Relations Framework Act 13 of 2005.

Intergovernmental Panel on Climate Change, *Climate Change 2007: Impacts, Adaptation and Vulnerability – Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change* (2007) .

IPP Procurement Programme, 2012 GN 1074 in GG 36005 of 19 December 2012.

Kwazulu-Natal Planning and Development Act 6 of 2008.

Listed Activities and Associated Minimum Emission Standards identified in terms of section 21 of the Air Quality Act GN 893 of 2013 GG 37054 of 22 November 2013.

List of activities which result in atmospheric emissions which have or may have a significant detrimental effect on the environment, including, health, social conditions, economic conditions, ecological conditions or cultural heritage, GN 248 in GG 33064 of 31 March 2010 (as amended by GN 964 published in GG 35894 of 23 November 2012) read with GN 1210 of 24 December 2009.

List of Preferred Bidders for the Third Bid Submission Phase' 05 November 2013.

Local Government: Systems Act 32 of 2000.

Local Government: Municipal Structures Act 117 of 1998.

Mineral and Petroleum Resources Development Act 28 of 2002.

Mineral and Petroleum Resources Development Amendment Bill B15-2013 GG 36523 of 31 May 2013.

Minimum emission Standards (MES) published in GN 893 in GG 37054 of 22 November 2013.

National Ambient Air Quality Standards GN 1210 in 2009 *GG* 32816 of 24 December 2009.

National Energy Act 34 of 2008.

National Energy Efficiency Strategy of the Republic of South Africa GN 908 of 2009 GG 32342 26 June 2009.

National Energy Regulator Act 40 of 2004.

National Energy Bill B52-2008 in GG 31124 of 3 June 2008.

National Energy Regulator Amendment Bill GN 180 in GG 34825 of 8 December 2011.

National Energy Regulator of South Africa Act 40 of 2004.

National Environmental Management Act 107 of 1998.

National Environmental Management: Air Quality Act 39 of 2004.

National Environmental Management Laws Amendment Act 25 of 2014 (NEMLA 3) GN 448 in GG 37713 of 2 June 2014.

National Environmental Management: Biodiversity Act 10 of 2004.

National Environmental Management: Protected Areas Act 57 of 2003.

National Environmental Management: Waste Act 59 of 2008 (Waste Act).

National Framework for Air Quality Management in the Republic of South Africa GN 919 in GG 37078 of 29 November 2013.

National Nuclear Regulator Act 47 of 1999.

National Treasury, South Africa 'A Framework For Considering Market-Based Instruments to Support Environmental Fiscal Reform in South Africa' (2006).

National Water Act 36 of 1998.

Northern Cape Planning and Development Act 7 of 1998.

Nuclear Energy Act 46 of 1999.

People's Republic of China, Ministry of Commerce, Renewable Energy Law of the People's Republic of China (Adopted at the 14th Meeting the Standing Committee of the Tenth National People's Congress on February 28, 2005; Amended according to the Decision of the 12th Meeting of the Standing Committee of the 11th National People's Congress of the People's Republic of China on December 26, 2009) <http://english.mofcom.gov.cn/article/policyrelease/questions/201312/20131200432160.shtml >.

Petroleum Products Act 120 of 1997.

Promotion of Access to Information Act 2 of 2000.

Promotion of Administrative Justice Act 3 of 2000.

Promotion and Protection of Investment Bill 2013, GN 1087 in GG 36995 of 1 November 2013.

Proposed Technical Regulations for Petroleum Exploration and Exploitation GN 1032 in GG 36938 of 15 October 2013.

Regulation on New Generation Capacity 2009 GN R721 in GG 32378 of 5 August 2009.

Regulations in terms of S 21L of the Income Tax Act 1962, on the Allowance for Energy Efficiency Savings, GN 971 in GG 37136 of 9 December 2013.

Regulations on use of water for mining and related activities aimed at the protection of water resources GN R 704 in GG 20119 of 4 June 1999.

Regulatory rules for Power Purchase Cost Recovery, NERSA, GN R119 *GG* 32964 of 24 February 2010.

Regulatory Rules on Selection Criteria for Renewable Energy Projects under the REFIT Programme, made in terms of Reg 7 of Electricity Regulations on New Generation Capacity GN R721 GG 32378 of 5 August 2009.

Renewable Energy Feed-In Tariff (REFIT) Guidelines (March 2009).

Act on Granting Priority to Renewable Energy Sources (Renewable Energy Sources Act) (EEG 2000) (Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany).

Regulations Regarding the Phasing-out and Management of Ozone Depleting Substances GN 351 in GG 37621 of 8 May 2014.

Spatial Planning and Land Use Management Act 16 of 2013.

Vaal Triangle Air-Shed Priority Area Air Quality Management Plan GN R 613 in GG 32263 of 28 May 2009.

Water Services Act 108 of 1997.

Western Cape Land Use Planning Ordinance 15 of 1985.