
# Trade, climate change and renewable energy: regulatory conflict or convergence?

**Ms. Anastasia Chrisa Thomaides**

**Student Number: 543057**

**Submitted in partial fulfilment of the requirements for the degree of Masters of Laws by Coursework and Research Report at the University of Witwatersrand, Johannesburg**

**Supervisor: Professor Tumai Murombo**

## Table of Contents

## Abstract

The research report seeks to explore the link between trade and the environment, with a particular focus on the renewable energy sector. The aim is to determine the tensions and unification amongst the regulatory tools of the World Trade Organisation and Climate Change Regimes will be discussed, in a manner that shows how trade can assist in mitigating or adapting to the effects of climate change. As such the intention of the report is to answer the question of how do we use trade to disseminate energy technology as set out in the Sustainable Development Goals ("SDGs") in order to ensure access to affordable, reliable, sustainable and modern energy for all, in both an international and South African context. The result, however, lead the need for more inclusive global regime that is less fragmented, over and above the need for improvement for domestic laws as well as infrastructure to generate electricity in order to provide for much more enabling approach to the investment of renewable energy.

## Introduction

In the past few years, information regarding a plethora of catastrophic natural disasters has been consistently flooding news channels, as evidence that a global climate shift has exponentially increased. The consequences of human expansion and production of vast amounts of greenhouse gases ("GHG") has resulted in an environment that threatens human survival, and without action the penalties of global warming will be detrimental to the development of society.[1] One of the major contributors towards climate change is the energy industry, specifically relating to electricity generation resulting from the extraction of coal. The energy sector is responsible for the consumption of massive volumes of exhaustive non-renewable fossils fuels, for the purpose of generating a sufficient amount of power to meet the demands of current and future human consumption. The industry, however, is guilty of emitting high sums of carbon dioxide ("CO2") thereby polluting the environment, which has a detrimental effect on air and water quality in surrounding areas and subsequently a negative impact on human health, over and above its causal link to increased global temperatures.[2]

There exists an intricate relationship between developing an economically resilient society and fighting against an adverse environmental impact. For that reason, the global community has highlighted, in the recent Paris Climate Agreement, the importance to transition from a heavily reliance on fossil fuels towards a low carbon energy efficient industry.[3] This is to be achieved through the adoption of renewable and cleaner energy technologies, thereby reducing countries' carbon footprints.[4] However, in order to achieve a greener technology transfer, international cooperation is essential for an effective mitigation and/or adaptation approach towards the effects of a changing environment. As such, consideration must be given to unify the different legal policies in areas of international trade rules, the current climate change regime

---

[1] National Academies Press, Attribution of Extreme Weather Events in the Context of Climate Change, (2016) <https://www.nap.edu/read/21852/chapter/1>
[2] J.A. Montagna Yale-New Haven Teacher Institute. The Industrial Revolution, (2013) <http://www.yale.edu/ynhti/curriculum/units/1981/2/81.02.06.x.html>
[3] United Nations. FCCC/ CP/2015/L.9/Rev.1. Report on the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 11 December 2015.
[4] T Humby LJ Kotzé, Rumble O, and A Gilder *Climate Change Law and Governance in South Africa* (2016) 18 -1 – 18-3.

as well as factors pertinent to the energy sector - particularly concerning renewable energy, in a manner that promotes sustainable development[5] and energy efficiency.[6]

As a result, this research report seeks to reconcile global trade rules with mitigation and adaptation strategies as part of the climate change legal framework, while pointing to the possibility of subsidizing renewable energy as a method to move away from the business as usual conundrum regarding fossil fuels and transition towards a carbon resilient society. Consequently, the report takes a look at both international and national regulatory tools, in the South African context, in order to determine the best method to promote trade openness[7] and effectively regulate renewable energy in the country.

Part I of the research report explores the synergies and possible contradictions between trade law and the climate change regime. The author will engage with each topic separately and then explore the interlinkages between the two subject matters, whilst acknowledging the various guiding principles and rules relevant to the essay. Part II investigates how the relationship between trading policies and non-binding environmental legal frameworks affect the energy sector, particularly concerning a renewable energy scope. Part III examines South Africa's response to regulating the energy sector in the backdrop of international trading and climate change agendas, whilst taking into account the countries' developing status and current legislative successes and hurdles.

---

[5] Sustainable Development refers to 'development that meet the needs of the present, without compromising the ability of future generations to meet their own needs'. World Commission on Environment and Development (WCED). World Commission on Environment and Development *Our Common Future* (the Brundtlan Report) (1987), 43.

[6] RK Pachauri, MR Allen, VR Barros, J Broome, W Cramer, R Christ & NK Dubash *Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change* (2014) 151.

[7] Identified as assisting with the effects of climate change via endorsing the efficient allocation of world resources, assisting in raising the standards of living and improving access to environmental goods. World Trade Organisation 'The multilateral trading system and climate change: introduction' <https://www.wto.org/english/tratop_e/envir_e/climate_intro_e.htm>

# Part I: Piecing together trade and climate change: synergies and contradictions

## Chapter 1: The emergence of trade law and climate change regime

According to the Intergovernmental Panel on Climate Change's ("IPCC") 5th Assessment Report,[8] industrialisation or human activity has 'unequivocally' led to a rapidly changing natural and human systems.[9] The driving factors can be attributed largely to economic and population growth, as a result of an increase use of fossil fuels in order to meet the demands of social progress that has ultimately led to an unsustainable consumption of natural resources. As such, balance needs to be restored by reducing costs and challenges associated with future pathways for adaptation and mitigation strategies which aim to reduce and manage the risks of climate change.[10]

In section 1.1 of this chapter, the author will layout the inner workings of the World Trade Organisation ("WTO"), the relevant agreements and possible contributions it has made to the protection and preservation of the environment, if any. Section 1.2 will illustrate the complexities of the current climate change policy, whilst taking note of the trade barriers experienced in executing international environmental objectives as well as the importance of renewable energy in light of international instruments.

---

[8] IPCC, 2014: Summary for policy makers. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* [O Edenhofer, Y Sokona (eds.)] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. The IPCC was set up in 1988 by the World Meteorological Organisation (WMO) and United Nations Environment Programme (UNEP), as an international body for 'assessing the science, technical and socio-economic information relating to climate change'.

[9] J Glazewski & L du Toit *Environmental Law in South Africa*. Service Issue 1 (2013) 3-1 at 3-6. Climate Change can be defined as 'a change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere, and which is in addition to natural climate variability observed over comparable time periods'.
Article 1(2) of the UNFCCC.

[10] Pachauri, Rajendra K., et al. *Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change*. IPCC, 2014.

## Section 1.1: Taking a closer look at International Trade Rules

Regulating the 'world trade order', which encompasses economic activities and international trade flows, is the multilateral trading system referred to as the World Trade Organisation ("WTO").[11] The universal organization was established by the Marrakesh Agreement,[12] also referred to as the WTO Agreement, which sets out the scope and function of the WTO as a forum for negotiating, implementing and monitoring agreements aimed at reducing obstacles to international trade relations amongst its members.[13] In addition, the WTO settles disputes arising from the interpretation and application of the global trade rules as a method to ensuring a 'level playing field for all', whilst contributing to economic growth, management and development.[14] Thus it is of vital importance that there exists 'good governance at a national level, a reduction in trade barriers, more development aid, satisfactory international cooperation and global governance of economic globalisation and trade'.[15]

It is important to note that the necessity of enforcing international trade rules under the WTO is to firstly, restrain countries from taking trade restrictive measures both in their own interest and in the interest of the world economy. Secondly, to provide a degree of predictability and security whilst ensuring a greater measure of equity in international economic relations. Finally, for the protection and promotion of important societal values and interests, such as maintaining a sustainable environment that has become a pivotal international concern.[16]

---

[11] The WTO has been described as *sui generis*, it was established in 1995 and created by way of Uruguay Round negotiations, and is the successor to the regime surrounding the 1947 General Agreement on Tariffs and Trade ("The GATT"). World Trade Organisation ("WTO"), 'The multilateral trading system –past, present and future', <https://www.wto.org/english/thewto_e/whatis_e/inbrief_e/inbr01_e.htm>

[12] WTO Agreement: Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 1867 U.N.T.S. 154, 33 I.L.M. 1144 (1994)

[13] Article II and III of WTO Marrakesh Agreement.

[14] Glasewski (Note 9 above) 4-6 and 4-7.

[15] Van den Bossche Peter and Zdouc, Werner *The Law and Policy of the World trade Organisation Text, Case and Materials* 3 edition (2013), 30.

[16] *Ibid*, 32 – 34.

To achieve the objectives of the WTO, a set of rules needs to be abided by members, having been negotiated into specific agreements for the trade in goods and services.[17] At first glance, the Marrakesh or WTO Agreement is the principle source of WTO law and consists of a short basic agreement with numerous other agreements included in its annexes. Consequently, members regard it as a 'single undertaking' and is applied equally and are equally binding to members.[18] Regulating trade in goods, forming part of the scope of this report, is the updated 1994 General Agreement on Tariffs and Trade ("the GATT 1994"),[19] found under Annex 1A of the WTO Marrakesh Agreement and is one of the thirteen multilateral agreements found under the annex. Other agreements that form part of this essay, include the agreement on Trade-Related Investments Measures ('the TRIMS Agreement') and the Agreement on Subsidies and Countervailing Measures ('the SCM Agreement'), which will be discussed in Part II of this Report.

Moreover, the agreements of the WTO follow a set of guiding principles[20] that underlie the implementation of trade policies: the most prominent is the "rule of non-discrimination" that can be divided into two components – the Most Favored Nation ('MFN") Rule[21] and National Treatment.[22] The MFN rule requires a WTO member that grants certain favorable treatment to any given country to grant the same favorable treatment to all other WTO members. Thus a WTO member is not allowed to discriminate between its trading partners and prohibiting a country to discriminate between other countries.[23] Whereas, the National Treatment obligation requires a member of the WTO to treat foreign goods no less favorably than domestically

[17] WTO members can undertake and implement commitments for the liberalization of trade in services which is regulated by the General Agreement on Trade in Services ("the GATS"), found under Annex 1B of the Marrakech Agreement, this section is however beyond the scope of this report.
[18] Van den Bossche, (Note 14 above), 40 – 41.
[19] The GATT 1994 has incorporated by reference elements of the GATT 1947. Referred into Paragraph 1 (b) of the introductory text of the GATT 1994. GATT 1994:General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187, 33 I.L.M. 1153 (1994) [hereinafter GATT 1994].
[20] WTO, 'Principles of the Trading system', <https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm>
[21] Article I:1 of GATT.
[22] Article III:2 and Article III:4 of the GATT 1994 and Article 3 of the TRIPS Agreement.
[23]Narlikar, A "The World Trade Organization: A Very Short Introduction" *The International and Comparative Law Quarterly* (2005) 22–58, 28.

produced like goods thus the obligation prohibits a country to discriminate against other countries.[24]

With reference to environmental protection, the WTO explicitly highlights sustainable development as a fundamental goal in the Preamble to the Marrakesh Agreement. The framework of the WTO provides for environmental objectives and trade-related measures to be followed by means of specialized agreements, particularly referring to the Agreement on Technical Barriers to Trade ('the TBT Agreement') that deals with product regulations; and the Agreement on Sanitary and Phytosanitary Measures ('the SPS Agreement') which concerns food safety and animal and plant health, to mention a few, as such these agreements aim to balance the need for environmental protection as well as to ensure that no unnecessary obstacles exist to international trade.[25] In addition, the GATT provides an exception to its rules and principles through Article XX, by which certain environmental incidents allow for countries to be exempted from violating provisions, so long as the measures are justified and is to be interpreted by WTO Dispute Settlement Body.[26] Moreover, the Doha Development Agenda[27] marks the first instance whereby environmental issues explicitly feature in the context of multilateral trade negotiations and provide a forum in the trading arena to enhance mutual supportiveness of trade and environmental objectives.[28]

However, issues surrounding climate change are not part of the WTO work programme and there is no rules specifically related to this area of concern, but it is relevant as policies in the various industries do intersect in different ways. For example: trade openness can assist with efforts to mitigate and adapt to the impacts of global warming by improving access to environmental goods, in addition, climate change policies may have an impact on trading mechanisms by modifying conditions of competition.[29] A more in-depth analysis on the linkages between the issues of trade

---

[24] *Ibid,* 28.
[25]WTO, 'WTO rules and Environmental policies: Introduction <https://www.wto.org/english/tratop_e/envir_e/envt_rules_intro_e.htm>
[26] WTO, 'WTO rules and environmental policies: GATT exceptions' <https://www.wto.org/english/tratop_e/envir_e/envt_rules_exceptions_e.htm>
[27] WTO, 'Doha Round', <https://www.wto.org/english/tratop_e/dda_e/dda_e.htm>
[28] WTO, 'An introduction to trade and environment in the WTO' <https://www.wto.org/english/tratop_e/envir_e/envt_intro_e.htm>
[29] WTO, 'the multilateral trading system and climate change: introduction', <https://www.wto.org/english/tratop_e/envir_e/climate_intro_e.htm>

and global warming will feature in Chapter 2 of this Report, we now turn to the complexities of the climate change regime.

## Section 1.2: The complexity of the international climate change regime

It is undeniable that climate change is the most urgent environmental concern facing the global community. Yet despite its earnestness, laws and regulations surrounding the theme is riddled in complexity as the regime governing the efforts to limit climate change is loosely coupled with a paradox of either conflicting or mutually reinforcing results.[30] This is mainly due to global warming having a transnational effect that impacts diverse jurisdictional actors with different country objectives, in addition to affecting a variety of interdisciplinary topics, such as trade and energy law.

To begin with, the World Climate Conference held by the World Meteorological Organisation ("WMO") in 1979, marked the first time that the global community had acknowledged that there existed a universal intergovernmental problem relating to climate change.[31] As such, to address this conundrum, various instruments, including treaty law, were used to entice a global effort. The first major accomplishment concerned the adoption of the United Framework Convention on Climate Change ("UNFCCC"), which was one of the outcomes of the Earth Summit held in Rio de Janeiro, Brazil in 1992.[32] The purpose of the UNFCCC is to 'deal with problems associated with the perturbations in a global climate system', by aiming to reduce and stabilize carbon emission levels.[33] However, the UNFCCC did not impose specific reduction targets, but rather acted as a negotiation tool that merely imposed general obligation on member states and provided guiding principles for the implementation of other agreements and protocols.[34]

---

[30] Keohane, R., and David V. "The regime complex for climate change." *Perspectives on politics* (2011), 7-23.
[31] Epps, T, and Green, A, *Reconciling Trade and Climate: How the WTO Can Help Address Climate Change*. Edward Elgar Publishing, (2010) 44.
[32] UNFCCC, 'First steps to a safer future: Introducing The United Nations Framework Convention on Climate Change' <http://unfccc.int/essential_background/convention/items/6036.php>
[33] Article 2 of the UNFCCC: 'to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous atmospheric interference with the climate system'.
[34] Kidd, M *Environmental Law* Juta (2011), 60.

As a result, the Kyoto Protocol[35] was imposed in 2005, as a strategy to provide enforceable and mandatory GHG emission reduction targets and 'operationalise' the UNFCCC, which were to be accomplished through two commitment periods spanning out to the year 2020, and provided legally binding commitments on developed countries.[36] This was to be achieved through the use of three flexible mechanisms: namely, joint implementation,[37] emission trading[38] and clean development.[39] These emission reduction mechanisms are aimed to stimulate sustainable development through technology transfer and investment in a cost-effective manner that also encourages the private sector and developing countries to contribute to emission reduction targets.[40] It is important to note that developing countries were not subjected to the same standard as developed countries due to financial and 'historical carbon contributory differences'.[41] As a result the Kyoto Protocol differentiated the duties and obligations between developed and developing countries as envisioned by the principle of common but differentiated responsibility ("CBDR") on the basis of equity and respective capabilities.[42]

In recent climate change developments, the 2015 Conference of the Parties ("COP21"), held in Paris,[43] marked a historical achievement in international negotiations when member Parties agreed to limit global warming by 2°C, or less. As

---

[35] UNFCCC, 'Kyoto Protocol', <https://unfccc.int/kyoto_protocol/items/2830.php>.
[36] UNFCCC, 'Making those first steps count: An Introduction to the Kyoto Protocol'. <http://unfccc.int/essential_background/kyoto_protocol/items/6034.php>.
[37] Article 6 of the Kyoto Protocol, that 'allows developed countries to earn emission reduction units (ERUs) from an emission-reduction or emission removal project in another developed country, each equivalent to one tonne of CO2, which can be counted towards meeting its Kyoto target. Thus it offers Parties a flexible and cost-effective means of fulfilling a part of their Kyoto commitments, while the host Party benefits from foreign investment and technology transfer'. UNFCCC 'Joint Implementation (JI)' <http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php>
[38] Article 17 of the Kyoto Protocol, which 'allows countries that have emission units to spare - emissions permitted them but not "used" - to sell this excess capacity to countries that are over their targets'. UNFCCC, 'International Emissions Trading' <http://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php>
[39] Article 12 of the Protocol, which 'allows a developed country to implement an emission-reduction project in developing countries'. UNFCCC, 'Clean Development Mechanism' <http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php>
[40] UNFCCC, 'The Mechanisms under the Kyoto Protocol: Clean development mechanism, joint implementation and emissions trading', <http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php>
[41] Thomaides, A, *Carving our way to a greener future: South Africa's climate change response strategy* (2016), 7.
[42] A CISDL Legal Brief. 'The Principle of Common But Differentiated Responsibilities: Origins and Scope'. (2002). <http://cisdl.org/public/docs/news/brief_common.pdf>. Article 4 of the UNFCCC.
[43] United Nations. FCCC/ CP/2015/L.9/Rev.1. Report on the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 11 December 2015.

such, in formulating the Paris Climate Agreement, countries voluntarily pledged their commitment to reduce GHG emissions through an energy market transition, in the hope to achieve a greener objective through social and political behavioural change.[44] The Agreement required countries to fabricate Nationally Determined Contributions ("NDC's") as a method to outline individual climate actions in the context of their own national priorities, circumstances and capabilities. As a result, the Paris Climate Agreement is not legally binding as it does not require parties to implement international regimes to domestic laws in a form of specific global 'target' obligations, as witnessed under the UNFCCC and Kyoto Protocol.[45] In addition, the Agreement renders the common but differentiated responsibility principle as futile, by ignoring historical emissions as well as international equity considerations of developed and developing countries.[46] Instead the Paris Agreement employs a bottom up approach which gives both developed and developing countries responsibility to mitigate and adapt to the impacts of climate change, however developing countries are still eligible for technical and financial support.

To ensure the successful implementation of the Paris Climate Agreement, the 22nd Conference held in Marrakech, Morocco, in November 2016 ("COP22"),[47] which seeks to, over and above other notable decisions, remove market-based barriers that prevent countries from embracing cleaner, low emission energies.[48] This is to be achieved by reducing the cost of renewable energy technologies and deploying key climate change tools as well as to stimulate investment in the energy arena.[49] However, no definitive action came out of COP22, instead it concluded that more negotiations need to be taken for the implementation of any decision.

Furthermore, the author is of the opinion that the inevitable question which arises is on the importance and impact that the three above-mentioned international

---

[44] Clemencon, R, "Sustainable development, climate policies and EU-leaderships: A historical-Comparative analysis" (2016) 5 *European Journal of Sustainable Development* 125,126.
[45] *Ibid*, 126.
[46] Clemencon, R, "The two sides of the Paris Climate Agreement: dismal failure or Historic Breakthrough?" (2016) 25 *Journal of Environment and development* 3-24, 3.
[47] El-Kaltiri, L'The Road to Marrakech: Key Issues for COP22.' *Policy Brief*, OCP Policy Centre, September (2016) 1 and 2.
[48] *Ibid*, 7 and 8.
[49] World Trade Organisation 'COP22: Geneva agencies highlight important role of trade in addressing climate change' <https://www.wto.org/english/news_e/news16_e/envir_12nov16_e.htm>

instruments have on the renewable energy sector. The renewable energy sector which is described in more detail in Part II below is of paramount importance with regards to these instruments, this is due to the fact that without renewable energy there is unfortunately a very limited chance of success in order to adapt and mitigate against the effects of climate change. Firstly, if one looks at the inception of the UNFCCC, while no emission reduction targets were imposed, the logic pertained to the fact that the general obligations imposed stemmed through the future use and implementation of renewable energy worldwide, regardless of the state's economic position. Secondly, if one looks at the Kyoto Protocol and its purpose, the emission reduction targets imposed on developed countries were partly to be achieved through the use of renewable energy which not only placed massive emphasis on the need to develop the technology but also to share/transfer it with the more vulnerable developing world. Lastly, the voluntary pledges described in the Paris Agreement in 2015 also revolved around the increased usage of renewable energy at a local level.

If one takes into account how all three legal instruments were highly involved in the usage of renewable energy in order to address issues pertaining to climate change, it becomes evident that renewable energy is not only at the centre of discussions but it is of crucial importance that its implementation is treated as a priority if we are to achieve the common goal that all states share in the fight against climate change. In other words, the importance and impact that all of these instruments have on the renewable energy sector is absolutely paramount thereby placing a monumental amount of importance on the need to not only have and promote renewable energy but also to increase its demand and implementation as much as possible worldwide.

To summarise, the design of the climate change framework provides a level of flexibility, this is due to the fact that in reaching the objectives of the above-mentioned treaties is often highly dependent on individual countries' efforts, most of which have a fragmented legal regulatory framework. The significance of the regime, however, is to promote a behavioural change and pressurise countries to transition towards renewable energy technologies in a manner that sees less reliance on coal-powered stations. This can be attained through a technology transfer, which is why trade liberalisation in an integral part to transitioning to a low carbon society. In the next

chapter we investigate synergies between trade and climate change policies that can assist in effectively addressing climate change issues.

## Chapter 2: Interlinkages of trade and climate change law

With the dawn of the green era, the global community has sought to integrate developments between various fields, such as the complex relationship between trade and the environment, in a manner that is most sustainable and supportive to each other.[50] Trade in goods and services has the potential to stimulate wealth and well-being, if managed properly, trading mechanisms can be used to prevent over-exploitation of natural resources and mitigate wastage that often arises from inefficiency.[51] In addition, effective policies and implementation can avoid negative externalities on people and the environment, resulting in less degradation of the environment and improve quality of human-life.[52] In order to unify the difference between trade and climate change law, one would have to 'place individual economic and social actors at the center of the analysis of how to maximize market freedom while respecting human dignity'.[53] As such, through the exchange of goods and subsequent increase in economic growth, the introduction of new or improved technologies can assist in enabling environmental advancements such as decarbonizing the energy sector.[54]

In addition, and with a great degree of interconnectedness, Article 10 of the Paris Agreement labelled 'Technology Framework', becomes a vehicle of crucial importance as it intends to encourage and accelerate technological innovation with support from the Convention's technology and finance mechanisms. Article 10 also promotes collaborative approaches to research and development by encouraging parties to facilitate access to technology, especially for the benefit of developing country parties.[55] In other words, trade is of great importance in aiding technology transfer between nations as it serves as the connecting bridge between the vulnerable developing countries and developed countries in the fights against climate change. This is not only needed but it is essential in order to stray away from fossil fuel

[50] Glazewski, (Note 9 above), 4-2.
[51] *Ibid*, 4-3.
[52] *Ibid*, 4-5.
[53] Charnovitz S 'What is international economic law?' (2011) 14 (1) *Journal of International Economic Law*, 3-22
[54] Glazewski, (Note 9 above), 4-3.
[55] DLA, 'the UNFCCC Paris agreement: impressions from the negotiating table for the energy sector – and 10 Key points about what comes next', 18 December 2015, https://www.dlapiper.com/en/peru/insights/publications/2015/12/the-unfccc-paris-agreement/.

consumption and focus on the implementation, usage and transfer of renewable energy so as to reduce GHG emissions.

But first, in addressing issues concerning global warming results in performing a 'global public good', too often self-interest countries tend to relax their efforts in reducing GHG emissions, taking on the position of a 'free-rider' with all the benefits and none of the costs.[56] In the pursuit of 'global and indivisible public good',[57] co-operation in the international arena should assist in combating climate change, however this conceived to be a challenge due to the fragmentation of laws associated with state sovereignty.[58] At the forefront and as seen above, international trade and environmental law are significantly interlocked, as impacts of a changing environment, such as drought and floods, can inadvertently threaten trade patterns and infrastructure whilst countries learn to adapt to the catastrophic effects of a warming environment, in addition many trading mechanism contribute to global warming through various trade policies such as transportation of goods.[59]

This leads to the next point which states that in order to achieve a global balanced consensus, we must concentrate our efforts on a system which is beneficial for both developing and developed states. [60] This system must incorporate an equilibrium between the three facets of sustainable development while also taking into account the use of trade, through the WTO, to ensure that carbon credits/units, transfer of technology, adaptation and mitigation efforts strike an economic benefit for the parties involved while advancing the protection of the environment.[61] In addition, it is of vital importance to note that according to Condon, the term sustainable development has been obscured under the UNFCCC in that under Article 3 as the term heavily relies on the benefit of economic growth as a method of adaptation to the effects of a warming environment, rather than the interlocutory definition of 'economic development,

[56] Epps (Note 30 above), 22 – 23.
[57] Aerni, P, et al. "Climate change and international law: exploring the linkages between human rights, environment, trade and investment." German YB Int'l L. 53 (2010) 139, 141.
[58] *Ibid,* 141
[59] Rajamani, L, "The Durban platform for enhanced action and the future of the climate regime." *International and Comparative Law Quarterly* 61.02 (2012) 501-518.
[60] Aerni, (Note 56 above) 186.
[61] *Ibid*, 187 and 188.

environmental protection and social upliftment'.[62] Consequently, this interpretation may affect certain analysis of treaties, especially when specific obligations are not mentioned.[63]

As such, there exists a number of principles that underline the international legal framework. The most notable, firstly, is the precautionary principle which emphasizes the need for states to restrict or prohibit activities with the potential to cause serious damage without scientific certainty.[64] The principle is highly controversial, especially in the trade arena, as seen in the *Beef Hormones* Case[65] whereby the Appellant Body declared that there must be 'sufficient scientific evidence' as a method to manage risk in decision making during trade based restrictions.[66] This is clearly a deviation from Principle 15 of the Rio Declaration on Environmental and Development, which clearly provides that 'states should protect the environment according to their capabilities to avoid serious threats or irreversible damage despite lack of full scientific certainty, and that shall not be used as a reasoning for postponing cost effective measures'.[67]

Developing countries are especially calling for the CBDR principle to be enforced, arguing that developed countries are at the forefront at depleting and indulging in harmful environmental practices, as a result open trade practices are called into action.[68] However, many view that wealth created by trade would not necessarily yield an improved environment, instead trade liberalization is seen to promote cheaper import or exports of natural resources, resulting in an increased demand.[69] In addition, developing or poorer countries are often expected to uphold with the same trade rules as developed or wealthier countries result in an unfair standard and ignores past global problems cause from the 'unregulated industrialized' north.[70] As such, in the past

---

[62] Condon, B, and Tapen S, *The role of climate change in global economic governance*. Oxford University Press, (2013) 22.
[63] *Ibid,* 26 and 27.
[64] Aerni (Note 56 above), 142.
[65] Panel Reports, *EC Measures Concerning Meat and Meat Products (Hormones)*, WT/DS48/R/CAN *(Canada)* / WT/DS26/R/USA *(US)*, adopted 13 February 1998, as modified by Appellate Body Report WT/DS26/AB/R, WT/DS48/AB/R, DSR 1998:II, p. 235 / DSR 1998:II, p. 699
[66] Sands, P and Peel, J, *Principles of international environmental law*. Cambridge University Press, (2012), 979 – 980
[67] Rio Declaration on Environment and Development, in Report of the United Nations Conference on Environment and Development, UN Doc. A/CONF.151/26 (Vol. I), 12 August 1992, Annex I.
[68] Glasewski (Note 9 above), 4-2 and 4-3.
[69] *Ibid*, 4-3.
[70] *Ibid*, 4-3.

trading mechanisms have contributed to a 'worldwide consumption of carbon intensive products, but by changing the management of such trade regulations and reforming the legal framework for energy supplies there exists a potential to decarbonize the way we use energy and slow down the effects of human induced global warming.[71]

What is more, in exploring the linkages between trade and the environment many authors find that 'trade regulations are critically important in assessing domestic policies and that potential trade remedies offer powerful incentives for all nations alike to participate in multilateral framework defining appropriate goals and principles'.[72] In other words, the author is of the opinion that it is trite that the domestic policies are drafted in a manner which support international trade taking into cognizance of the fact that the more nations participating in multilateral agreements, for instance regarding the transfer of energy between nations, the bigger the incentives will be for those participating. In this regard, the issue of using trade policies and regulations at both national and international levels to curb climate change become of crucial importance.

Additionally, it must also be borne in mind that in order for the WTO to embrace and promote the trade or transfer of energy between nations, 'a more efficient management' of energy sources is needed.[73] In other words, and as a priority, it must be established whether the particular energy source is fully state owned or whether it has been privatized. This is important due to the fact that 'state ownership over energy goods differ from typical goods and services in international trade, thereby affecting any consideration of a role of the WTO in this area'.[74]

A number of trade policies have the power to support efforts to curb climate change: the most notable include, first, Border Tax Adjustments ("BTA's") which refer to 'import taxes on goods for countries where companies do not have to pay for their emissions'. Second, trade liberalization in climate friendly goods and services, thus eliminating trade barriers on solar panels can help shift away from fossil fuels. The importance to reduce or eliminate tariffs to environmental goods and services is to attempt to create

[71] Aerni (Note 56 above), 159.
[72] *Ibid,* 139
[73] WTO, 'relationship between international trade and energy' <https://www.wto.org/english/res_e/publications_e/wtr10_richards_herman_e.htm>.
[74] *Ibid.*

a 'win-win' situation for trade, the environment and development.[75] Third, international carbon trading and offsets, includes mechanisms similar to the Kyoto protocol, Article 6 of the Paris Agreement foresees development of such an approach via bottom-up in hope that it will be faster implementing them than the UNFCCC. But there does not seem to be any implementation of carbon trading within the WTO. Fourth, compatibility of climate measures and trade rules, article 3.5 of the UNFCCC emphasizes, whilst using WTO Language, that 'measures taken to combat climate change, including unilateral ones, should not constitute a means of arbitrary or unjustified discriminations or disguised restriction on international trade'.[76] As a result, in the future it's most likely that WTO law will play a prominent role in climate change policies, given the difficulties in achieving global consensus, the WTO dispute settlement system can act as a forum to deal with issues pertaining to carbon leakage and competitiveness,[77] through lowering tariffs for climate friendly technologies or ensuring that unfair trade practices are not used in a way to block development.[78]

In the next chapter we investigate how the energy industry is affected by climate change and trade policies. More specifically, it will focus on how current sources of energy are impacted and how they need to be adjusted in order to embrace the renewable energy revolution with trade, through the WTO, being the vehicle necessary so as to facilitate the deployment of renewable energy in the fight against climate change.

---

[75] WTO, 'Eliminating trade barriers on environmental goods and services' https://www.wto.org/english/tratop_e/envir_e/envir_neg_serv_e.htm

[76] The Conversation, 'How trade policies can support global efforts to curb climate change', <https://theconversation.com/how-trade-policies-can-support-global-efforts-to-curb-climate-change-81029>

[77] Aerni (Note 56 above), 159.

[78] Kulovesi, K. "Real or Imagined Controversies-A Climate Law Perspective on the Growing Links between the International Trade and Climate Change Regimes." *Trade L. & Dev.* 6 (2014) 55, 58-59.

## Part II: Adding energy to the mix: an international perspective

## Chapter 3: How is the energy industry affected by climate change and trade policies?

The energy industry in reference to the extraction, production and use of fossil fuels, is one of the major contributors to climate change and atmospheric pollution. It is a multi-disciplinary field that encompasses various branches of law relating to energy production, conservation and utilization, over-and-above issues concerning economics and transport.[79] Yet, despite its intricacies, governments on an international scale have been reluctant to implement a worldwide regime, preferring the industry to be governed 'transnationally through bilateral and multifaceted treaties', resulting in a disjointed structure and a slowed progress in dealing with associated impacts.[80] As a result, climate change regimes involving the notion of sustainable development make reference to energy which often results towards a fragmented regulatory system.[81] The irony is that many countries are slow in their adoption of climate change policies, due to its intricacy and complexity which is why 'cross-sector collaboration, coordination and the use of a variety of regulatory tools is more beneficial as opposed to the singular regulatory approach.[82] Consequently, one can deduce that an inherent linkage between climate change policies and energy law exists,[83] as a result, issues associated with global warming can be used as a 'driver' to mitigate and adapt the energy industry towards cleaner technology.[84]

In section 3.1 of this chapter, the author will provide an outline of the nexus between climate change and energy law and then later point out in section 3.2, how trade rules have an effect on renewable energy.

---

[79] Klass, A, "Climate Change and the Convergence of Environmental and Energy Law." *Fordham Envtl. L. Rev.* 24 (2012): 180, 185 - 186.
[80] Humby (Note 4 above), 18-4.
[81] *Ibid*, 18-5. 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,* 384.
[82] Humby (Note 4 above), 18-5.
[83] Glazewski (Note 9 above), 3-5.
[84] Humby (Note 4 above), 18-5.

## Section 3.1: An introductory outline of the nexus between climate change and energy law

Looking through a global lens, with reference to the SDGs particularly relating to Goal 7, it must be emphasised that there is the need to 'ensure universal access to affordable, reliable, sustainable and modern energy services for all'.[85] Goal 7 recognizes that in order to assist in alleviating poverty, increase economic growth and promote sustainable development, then a sustainable energy resource should be a precondition.[86] The energy sector is facing a transition period, as countries from the globe have committed to reducing GHG emissions under the recent Paris Agreement and subsequent NDCs. Therefore, countries are sought to commit themselves to a decarbonised energy sector, whilst still meeting the rising energy demand and improved access.

It is important to note that the 2016 World Energy Trilemma identified various focus areas to change the way we think and interact with energy.[87] This is to be achieved mainly through transforming and diversifying the energy supply and electricity generation through government setting up realistic targets to improve energy efficiency and manage the country's electricity demand, in addition to extracting resources in a manner that is least damaging to the environment.[88] In doing so, countries begin to gear up for a renewable energy era, by ensuring transition to a decarbonised energy sector that provides a level of flexibility in order to promote easy access for different countries capabilities, considering privatisation and investing in renewable technology.[89] By changing the way we utilise energy resources one can improve the regulatory framework to promote efficiency and decrease wastages through better infrastructure and management. As such, the three dimensions to improving energy structure is, namely, energy security, equity and environmental sustainability, but then

---

[85] Sustainable Development Knowledge Platform, progress of goal 7 in 2017', <https://sustainabledevelopment.un.org/sdg7>

[86] Murombo, T 'Regulating energy in South Africa: enabling sustainable energy by integrating energy and environmental regulation.' (2015) 33(4) *Journal of Energy & Natural Resources Law* 320-348, 336.

[87] World Energy Council, *World energy Trilemma: Defining measures to accelerate the energy transition* (2016) p12-25.

[88] *Ibid*, 28

[89] *Ibid*, 54

again achieving the mentioned focus areas is highly dependent on each individual countries government implementation of green policies that aim towards an efficient sustainable energy system.[90] On the contrary, the complication in achieving such goals occurs when sustainability clashes against energy security, access and affordability, for example when climate protection laws, raised energy prices battle against affordability of energy, to which affordability takes preference.[91]

Most relevant to this essay is the Synthesis Report ("SYR"),[92] which 'integrates and distils findings of all the three working groups' contributions' to the 5th Assessment Report in the IPCC and incorporates findings relating to renewable energy sources and the management of risks.[93] The report ultimately summarises that human interference has caused catastrophic effects on the earth's atmosphere, such as extreme weather conditions and disastrous climate events, as a result, developments in the socio-economic paradigm have been slow to progress, where disadvantage communities have suffered the most.[94] Action must be taken through mitigation and adaptation approaches that are to be conducted in a sustainable manner, however, this can only be achieved through effective decision-making capable of analysing risks and benefits, whilst recognising the importance of good governance and taking cognisance of equity and economic assessments.[95] Which is also closely related to the developmental efforts in which responses should involve substantial co-benefits, synergies and trade-offs thus employing an integration approach to energy planning and implementation with the intention to generate a sufficient amount of power to meet the demands of current and future human consumption and ultimately assist in stimulating the economy by means of job creation, investments and trade while promoting environmental sustainability.[96] Thereby aligning national legislation with the

---

[90] *Ibid*, 4 - 6
[91] Toke, D, and Vezirgiannidou SE. "The relationship between climate change and energy security: key issues and conclusions." *Environmental Politics* 22.4 (2013): 537-552, 547.
[92] Allen, Myles R., et al. "IPCC fifth assessment synthesis report-climate change 2014 synthesis report." (2014).
[93] *Ibid*, 2 – 4.
[94] *Ibid*, 6 – 16.
[95] *Ibid*, 17. Kumar, Abhishek, et al. "A review of multi criteria decision making (MCDM) towards sustainable renewable energy development." *Renewable and Sustainable Energy Reviews* 69 (2017), 596-609.
[96] Synthesis Report (Note 91 above), 112.

objectives of international treaties - such as the UNFCCC, Kyoto protocol and Recent Paris Climate Agreement.

Moreover, international cooperation is critical in enhancing the effectiveness of global and national governance, where increasing efforts to mitigate and adapt to climate change imply, firstly to an improved energy efficient and cleaner energy resource, leading to a reduction of GHG emissions, and secondly, reducing consumption of energy by employing a greener living.[97] In addition, it is highly essential for national regions to promote a climate-sensitive energy policy and encourage investment in the renewable energy sector in order to increase non-fossil energy usage through greener resources and intelligent grids.[98] Ultimately, there exist a nexus between climate change objectives and the need for cleaner energy, which encompasses a range of mechanisms that may be helpful to assist in the drive against rapid climate change, including clean energy subsidies and border adjustments for carbon emissions,[99] these devices will be addressed in the next section.

## Section 3.2: The impact of trade on renewable energy

As a method to deliver on effective action against climate change mitigation and adaptation, it is necessary for climate policies to be translated into products and services that is capable of trading internationally. WTO Agreements and an increasing number of regional trade agreements,[100] 'play an important role in defining appropriate frameworks conditions for climate change policies'.[101] Consequently, in addressing the energy sector, the global community has sought to determine whether WTO Agreements will negatively or positively implicate policy frameworks surrounding the

---

[97] *Ibid*, page 81
[98] Leal-Arcas R. and Alvarez Armas, E., "The climate-energy-trade nexus in EU external relations," in Minas, S. and Ntousas, V. (eds.) *EU Climate Diplomacy: Politics, Technology and Networks*, Routledge (2017), 3 and 4
[99] *Ibid,* 3.
[100] An exemption to non-discrimination principle that allows a reciprocal preferential trade agreement between two or more parties to trade between themselves, usually in the form of removal or reduction of tariffs on imports from regional partners, thus creating a free trade area. WTO, 'Regional trade agreements' <https://www.wto.org/english/tratop_e/region_e/region_e.htm>
[101] Aerni (Note 56 above), 159. The chief areas of concern involve 'non-discrimination, process and production methods, border adjustments measures, carbon tariffs and subsidization of renewable energy'.

deployment of renewable energy.[102] The WTO Agreement and GATT do not expressly deal with energy law, per se, but rather contain rules of general application.[103] For that reason various WTO Agreements indirectly deal with energy laws via subsidies or industrial policies frameworks, to name a few.[104]

Accordingly, the SCM Agreement, as mentioned earlier, provides a definition of the term 'subsidy', as a 'financial contribution by government or public body, which confers a benefit' that can only be applied to a specific industry or group of enterprises.[105] Article VI and XVI of GATT[106] and Articles 3 to 9 of the SCM Agreement impose disciplines on the use of subsidies - some of which may be prohibited but might be subject to an exception surrounding environmental attributes taken place under Article XX(b) and (g) of GATT, as mentioned in section 1.1, in order to permit discriminatory measures taken by parties to address non-trade concerns and fulfil the WTO preamble which recognizes the concept of sustainable development and the need to protect the environment.[107]

According to Rubini,[108] subsidies may have a tendency to add more misrepresentations to market functioning and encourage ineffectiveness and 'rent seeking behavior' that be difficult to remove if distortions have occurred in their objective.[109] Hindrances to the deployment of renewable energy often move beyond trade and regulatory barriers, to name a few, but also include grid-infrastructure obstacles that require 'small-scale technology, in remote locations that are capable of handling large fluctuations of electricity generations', in addition to the lack of social acceptance.[110] Another significant obstacles concern the pricing externalities of

---

[102] Lewis, J. "The rise of renewable energy protectionism: Emerging trade conflicts and implications for low carbon development." *Global Environmental Politics* (2014), 1.
[103] Pauwelyn, J. "Global challenges at the intersection of trade, energy and the environment." (2010), 4
[104] Lewis (Note 101 above), 4 – 5.
[105] Article 1 of the Agreement on Subsidies and Countervailing Measures, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1869 U.N.T.S. 14.
Van den Bossche (Note 14 above), 748
[106] The provisions provide detailed rules on the power to unilaterally impose duties to counteract subsidized imports and determine the obligation on WTO members when granting subsidies.
[107] Van den Bossche, (Note 14 above), 748.
[108] Rubini, Luca. "The subsidization of renewable energy in the WTO: Issues and perspectives." (2011).
[109] *Ibid*, 3.
[110] *Ibid*, 3.

renewable energy and fossil fuels, where renewable energies are often seen as too expensive, as opposed to generating electricity via coal powered plants.[111] As such, Rubini summarizes that in order to achieve a proper policy support of renewable energy a 'proper institutional framework, comprehensive and synergetic policy programme and careful design of the measures of support' that can include subsidies with a clear objective, can make renewable energy more cost effective and assist in providing governments with more energy security and enable job creation.[112]

Consequently, energy subsidies matter in particular from the perspective of trade governance and global energy governance as a subsidy could be used to achieve a specific energy policy objective such as securing an energy supply.[113] In terms of this Report, an energy subsidy would be used as a method to advocate for renewable energy so as to mitigate climate change or air pollution.[114] There is no universal definition of the term 'energy subsidy', in simplest terms governments can either provide support directly by means of budgetary transfers or indirectly by way of stimulating the production or use of a particular fuels or form of energy in a manner that regulates prices for the consumers at below market rate.[115]

With reference to industrial policy, governments tend to use it as a method to promote the development of new industries that inevitably comes along with the adoption of new technologies, therefore it is important to grant subsidies to producers and consumers, usually for the purpose to correct market failure.*[116]* However, despite the renewable energy industry been identified as a strategic growth sector, many governments find it unnecessary to justify extended cost in relation with renewable energy to ratepayers unless there is direct economic benefits that can stimulates job creation and competitiveness in the domestic arena. For that reason, countries tend to encourage local manufacturing of renewable energy technology.[117]

---

[111] *Ibid,* 3.
[112] *Ibid*, 3 – 5.
[113] Van de Graaf, T., & van Asselt, H. (2017). Introduction to the special issue: Energy subsidies at the intersection of climate, energy and trade Governance. International Environmental Agreements: Politics, Law and Economics. doi:10.1007/s10784-017-9359-8, 314.
[114] *Ibid*, 318.
[115] *Ibid,* 317.
[116] Carbaugh, Robert J., and Max St Brown. "Industrial policy and renewable energy: Trade conflicts." *Journal of International and Global Economic Studies* (2012).
[117] Lewis (Note 101 above), 4.

According to Aerni, 'market based mechanisms for emissions reduction, such as emissions trading schemes ("ETS") and carbon taxes are considered the most efficient means of climate change mitigation. He anticipates that challenges are likely to arise with the problem of carbon leakage and competitive disadvantage for domestic producers. But these problems may be counteracted with equal charging of carbon to foreign producers through border adjustments measures and impose carbon tariffs on imports of carbon intensive products.[118]

By contrast, one has to note whether the UNFCCC is capable of playing a role in addressing fossil fuel subsidies, many authors agree that it can be done but one would have to take into account the history of the climate regime and ongoing political sensitivities. At the current moment treaties regulating the current climate change problem such as the UNFCCC, associated Kyoto Protocol and the Paris Agreement, do not contain fossil fuel subsidies. In addressing such a subsidy under the UNFCCC also raises concerns over national sovereignty and the north/south divide between developed and developing countries as reflected in article 3 and 4 of the UNFCCC.[119] At the moment the Kyoto protocol has failed in its mission due to various reasons but most notably due to political implications. In addition, fossil fuel subsidies prevent the uptake of renewable energy as they impair the competitiveness of the renewable energy technologies thereby distorting investment decisions. Thus being a barrier to achieving climate policy goals but should such a fossil fuel subsidy be reformed it provides an opportunity to reduce emissions and achieve economic benefits.[120]

Nevertheless, renewable energy trade disputes have created an intersection between support policies for clean energy and WTO regulations. The cases represented below demonstrate the intricacy of such disputes, which should be considered on a case-by-case basis,[121] and the connection trade has with the energy sector in its quest to promote renewable energy and mitigate climate change impacts:

---

[118] Aerni (Note 56 above), 160.
[119] van Asselt, H, and Kulovesi, K "Seizing the opportunity: Tackling fossil fuel subsidies under the UNFCCC." *International Environmental Agreements: Politics, Law and Economics* 17.3 (2017): 357-370.
[120] *Ibid.*
[121] Mondaq, 'WTO Case Summary: India-Solar Cells' <http://www.mondaq.com/x/533696/Renewables/WTO+Case+Summary+India+Solar+Cells>

To begin with, the case of *Canada-Renewables,*[122] was the first case that the WTO dispute settlement body looked at in terms of the renewable energy challenge, whereby the domestic content requirement (DCR) of Ontario's fee-in tariff was challenged as a discriminatory investment-related measure and prohibited import substitution subsidy.[123] The legal analysis of the case refers to two markets, firstly the market for renewable energy equipment and investment, which is globally implied that looks at discriminatory barriers against importation and how that affects developing countries. Secondly, the market for electricity - locally implied by way of cross border electricity and trade is limited by geographic location and grid connection infrastructure.[124] The case arose when the EU and Japan made the claim that the feed-in tariff scheme with local content requirement violated certain provisions of the TRIMS Agreement[125] and the constituted a prohibited subsidy under the SCM Agreement. The finding of the case was disputed due to the Appellant Bodies reluctance to classify the feed-in tariff scheme as a subsidy thereby showing a tense relationship between renewable energy support measures and how it would be qualified under the SCM.[126] It is important to note that the SCM does not contain environmental exceptions similar to those in Article XX of the GATT, leaving the scope for considering climate policy objectives.[127]

Later, the case of *India-Solar Cells*,[128] where the Appellate Body found that India's localization rules under its National Solar Mission discriminated against imported products in terms of Article III: of the GATT and Article 2.1 of the TRIMS Agreement that deals with National Treatment. The issue concerned the domestic content requirement ("DRD measures") that India imposed on solar power developers selling electricity to the government. India attempted to justify that their measure were within

---

[122] Appellate Body Reports, *Canada – Certain Measures Affecting the Renewable Energy Generation Sector / Canada – Measures Relating to the Feed-in Tariff Program*, WT/DS412/AB/R / WT/DS426/AB/R, adopted 24 May 2013
[123] Charnovitz, Steve, and Carolyn Fischer. "Canada–renewable energy: Implications for WTO law on green and not-so-green subsidies." *World Trade Review* 14.2 (2015): 177-210.
[124] *Ibid*, page 191
[125] 'WTO members' regulations dealing with foreign investments must respect the obligations in Article III that refers to the National Treatment obligation. Van den Bossche (Note 14 above), 44.
[126] Kulovesi (Note 77 above), 90 - 91.
[127] *Ibid,* 91.
[128] Appellate Body Report, *India – Certain Measures Relating to Solar Cells and Solar Modules*, WT/DS456/AB/R and Add.1, adopted 14 October 2016

the provisions by using the general exceptions in Article XX(d) and (j) of the GATT that imply that the measures were 'necessary to secure compliance with the laws' as well as the promotion of sustainable development and 'essential to the local short supply' that if not taken would cause disruptions to imports.[129] However, these arguments had failed before the Appellant Body, in addition to fact that there were no justification on the grounds of ensuring ecological sustainable ground growth or combating climate change.[130]

As a result, international investment of clean energy, however local content requirement and trade remedies can be seen as a policy disjointedness in aim to fulfil climate change goals.[131] The above mentioned cases highlight the continued maintenance of the status quo by the WTO that tends to ignore environmental consideration by prioritising free trade. Therefore, renewable energy entering the market as it stands can only be effective threw the existence of effective government regulation that aims to diversity their electricity generation.[132] Consequently, the World Energy Council Task force report has highlighted the needs to complete the Doha Round, as a means to promote renewable energy-related goods for the purpose of stimulating the exchange of clean energy technologies and ultimately assist in the drive to reduce GHG emissions. [133]

In the next chapter the author will analyse how South Africa has sought to regulate renewable energy in the country and how government has sought to support the industry.

---

[129] *Ibid, para **155.***
[130] Reuter, 'India loses WTO appeal in US solar dispute', <https://www.reuters.com/article/us-india-usa-solar/india-loses-wto-appeal-in-u-s-solar-dispute-idUSKCN11M1MQ>
[131] ICTSD, 'Breaking down the barriers to clean energy trade and investment <https://www.ictsd.org/bridges-news/biores/news/breaking-down-the-barriers-to-clean-energy-trade-and-investment>
[132] Ghori, Umair Hafeez. ""Reverse Permissibility" in the Renewable Energy Sector: Going Beyond the US-India Solar Cells Dispute." *Asian Journal of International Law* (2016) 1-28.
[133] WTO, 'Relationship between international trade and energy', <https://www.wto.org/english/res_e/publications_e/wtr10_richards_herman_e.htm>

## Part III: Regulating renewable energy in Southern Africa

## Chapter 4: South African perspective on the trade, renewable energy and climate change relationship

It is undeniable that South Africa has become exceedingly vulnerable to the effects of global warming.[134] Yet, it remains one of the top greenhouse gas ("GHG") emitters in the world, where 40% of their pollutants is contributed by the electricity sector, all while the majority of the country's energy needs are provided by coal.[135] In order to make a change, transformation in the economy sector needs to drastically alter so as to shift from a heavily fossil fuel intensive industry towards a cleaner energy resource, and instead, make space for a market focused on services and manufacturing.[136] But, consequences of such an extreme revolution may have economic and social ramifications in a country which is still developing and riddled in poverty.

The pursuit of more power has led to an unravelling of South Africa's goal towards ecological sustainable development. As indicated in section 24 of the Constitution of the Republic of South Africa, 1996, which states that everyone has a right to an environment that is not harmful to a person's health or wellbeing in reference to current and future generations. This right is enshrined in the Bill of Rights in a manner that encourages conservation and still promotes economic and social development. Yet, many do not reap the rewards: suffering from the harmful effects of mining pollutants, degradation of land through mining or lack of a basic right to electricity.

As a result, regulation of the power-producing industry is of high importance. With reference to policy documents, the 1998 *Energy White Paper*[137] was the first 'overarching document that represented a comprehensive and holistic perspective of the country's energy needs and options'.[138] Drafted in a democratic era that

---

[134] Barros VR 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) 1202 et seq
[135] Humby (Note 4 above) 18-1 – 18-3.
[136] *Ibid*, 18-2.
[137] Department of Minerals and Energy, White Paper on Energy Policy of the Republic of South Africa GN 3007 in Government Gazette No. 19606, 17 December 1998.56.
[138] Glazewski, Jan. "The legal framework for renewable energy in South Africa." (2010), 3.

emphasised the principles of transparency, accountability and inclusiveness,[139] the policy document noted the 'central role that fossil fuels play in the industrial and socio-economic development of the country, while simultaneously providing the infrastructural economic base required for foreign investment'.[140] However, many gaps and questions were left unanswered in relation to the interlinkages between the energy sector and environmental laws, most particularly relating to 'renewable and sustainable energy'.[141]

In order to address such an issue, the 2004 Renewable White Paper[142] was formulated to place due regard to sustainable use of natural resources[143] and 'emphasised the need to optimize the use of renewable energy resources as well as integrate their use into mainstream energy economy'.[144] However, at the time the paper was drafted, renewable energy was considered 'costly and consisting of underdeveloped technology thus thought of as a rather risky investment'.[145] But, South Africa had become aware of the need to unify environmental laws and energy regulations, as contemplated in section 2 of the National Environmental Management Act,[146] with 'sustainable development becoming the epicenter to legislation and regulatory policy'.[147]

In addition, many notable principles emerged from the drafted document, the most relevant refers to the principle of full cost accounting, which takes into 'consideration economic, social and environmental costs as well as the benefits connected with the

---

[139] Barnard, Michelle. "The role of international sustainable development law principles in enabling effective renewable energy policy-A South African perspective." *PER: Potchefstroomse Elektroniese Regsblad* 15.2 (2012): 01-40.
[140] Glazewski (Note 9 above), 18-5.
[141] Murombo (Note 86 above) 332
[142] Department of Minerals and Energy White Paper on Renewable Energy Policy of the Republic of South Africa GN 513 in Governments Gazette No 26169, 14 May 2004.
[143] Barnard (Note 138 above), 225
[144] Renewable Energy White Paper (Note 141 above), 43.
[145] Glazewski (Note 9 above), 18-6.
[146] National Environmental Management Act 107 of 1998. A primary environmental Statute, enacted to give effect to section 24 of the Constitution and address regulatory fragmentation by setting out principles and structures for the promotion of sustainable development.
[147] Murombo (Note 86 above), 333 - 334. Also reflected in the case of *BP Southern Africa (pty) Ltd v MEC for Agriculture, Conservation, Environment and Land Affairs* 2004 (5) SA 124 WLD, 144 B-D, which recognized the concept of sustainable development as an integrated approach attaining a protected environment whilst taking into consideration socio-economic concerns and principles.

implementation of the renewable scheme'.[148] It is notable as 'extensive policy studies indicate that pricing determinations for electricity in South Africa have hugely discounted the cost the environmental cost of producing power from fossil fuels'.[149] Regulating such cost of producing energy, as well as the factors associated with demand and supply is the National Energy Regulator of South Africa ("NERSA"), established under section 3 of the National Energy Regulator Act,[150] with a mandate that focuses primarily on the economic benefits of the electricity sector rather than the ecological footprint.[151]

This leads to the integration of energy resources planning and regulations upon which, the National Energy Act[152] and the Electricity Regulation Act[153] where both were enacted to assist in challenges associated with supply and management of energy.[154] At a closer look at the National Energy Act, we realize that little has been done in the development of energy laws in order to be in line with climate change regimes, having the majority of the focus on enhancing energy security.[155] In addition, the Energy Regulator Act offers factors, guiding the determination of tariffs and the granting of generating licenses, setting conditions on the sources in which electricity is generated under section 14 of the Act that ultimately led to the abandonment of renewable energy feed-in tariff ("REFIT") based on preferred technology procurement process that perceived the clean technology as not competitive.[156] However, this changed through the framework of the Renewable Energy Independent Power Producer Procurement Programme ("REIPPP"),[157] which encourages private sector investment, such as solar, photovoltaic (PV), concentrated solar power, to name a few.[158]

---

[148] Barnard (Note 138 above), 226.
[149] Murombo (Note 86 above), 335.
[150] National Energy Regulator Act 40 of 2004.
[151] Murombo (Note 86 above), 336.
[152] National Energy Act 34 of 2008.
[153] Electricity Regulation Act 4 of 2006.
[154] Murombo (Note 86 above), 338.
[155] Humby (Note 4 above), 18-19.
[156] *Ibid,* 18-21.
[157] IPP Procurement Programme, 2012 GN 1074 GG 36005 of 19 December 2012.
Renewable Energy Power Producers Procurement Programme <http://www.ipprenewables.co.za>
[158] LSE, 'South Africa', <http://www.lse.ac.uk/GranthamInstitute/country-profiles/south-africa/>

As a method to address issues relating to climate change – the National Climate Change Policy White Paper[159] was drafted in 2011 to present a vision for an effective climate change response to ensure a just transition to a climate resilient and low carbon economy by addressing adaptation and mitigation approaches through a short, medium and long trajectory period. In addition, the implantation of the Integrated Energy Plan ("IEP") that addresses the institutional steps in the supply and demand of energy while taking into account factors involving environmental agendas.[160] Later, the Long-Term Mitigation Scenario (LTMS) study, in an attempt to produce a sound scientific analysis from which the government could derive a long-term climate policy. The LTMS produced a series of policy recommendations, which will be at the heart of climate change policies.[161]

In addition, the Department of Trade and Industry as well as the Economic Development Department published an Industrial Action Policy Plan, which emphasised the need to develop green industries that promote energy efficiency in the manufacturing sector as well as related services.[162] Yet, the country has yet to implement an economy-wide carbon legislation, causing the country to become increasingly vulnerable to BCAs. This is due to South Africa's one-size-fits-all approach to trading policies, despite calls from companies to have a sectoral approach to trading mechanisms.[163] In addition, the electricity sector in itself has its own issues, in that electricity is under supply resulting in a narrow reserve margin and power shortages that requires greater financial investment for the extension of power infrastructure. Promoting renewable energy becomes a likely alternative but it is subject to many barriers, the most notable is the lack of non-discriminatory open access to key energy infrastructure such as the national energy grid that is majority owned by Eskom, a dominant player in the energy arena. [164]

---

[159] Department of Water and Environmental Affairs, White Paper on the National Climate Change Response GN 757 in GG 34695 of October 2011.
[160] Humby (Note 4 above),18-20
[161] LSE, South Africa', <http://www.lse.ac.uk/GranthamInstitute/country-profiles/south-africa/>
[162] *Ibid.*
[163] TIPS, Trade And Climate Change: Exploring The Impact On South African Business, 23 October 2013, <https://www.tips.org.za/events/development-dialogue-seminar/item/2727-development-dialogue-seminar-trade-and-climate-change-exploring-the-impact-on-south-african-business>
[164] Pegels, Anna. "Renewable energy in South Africa: Potentials, barriers and options for support." *Energy policy* 38.9 (2010): 4945-4954, 4948 – 4950.

It is evident that there exists an 'inherent and external' fragmentation between the development of energy law and regulation against environmental law. Disjointed in its co-ordination between departments and laws in a manner that causes ineffectiveness through the use of the regulatory tools, causing structural challenges through implementation, enforcement and lack of compliance.[165] Without addressing such issues it would be harder to achieve interest from investors and IPPs in the South African electricity sector. As a result, there needs to be a synergy between the two laws and by doing so we can ensure a technological transition from fossil fuels towards renewable energy.[166]

According to the Climate Action Tracker, South Africa has been negatively rated as 'inadequate'. Current implemented policies are unable to meet targets set out in the Nationally Determined Contributions ("NDC") and key policies such as the Integrated Resource Electricity Plan ("IRP")[167] has been hampered by the country's state-owned power producer known as Eskom. As a result, with a fast growing coal generation and slow renewable deployment, South Africa has failed in its global mission to limit global warming below 2 degrees Celsius, as set out in the Paris Agreement. [168]

The failure to live up to the NDC, can be summed up in the following, submitted by Tomain: *'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 advantage that access yields. In short fossil fuels favoritism is firmly entrenched in our political and regulatory cultures'*.[169]

Subsequently, the disjointedness of the regulatory attributes of energy and environmental law, caters for a platform that allows the heavy reliance on fossil fuels, resulting in an industry reluctant to change due to its existing structural composition of

---

[165] Murombo (Note 86 above), 321.
[166] Murombo, T 'Regulating energy in South Africa: enabling sustainable energy by integrating energy and environmental regulation.' (2015) 33(4) *Journal of Energy & Natural Resources Law* 320-348, 320 and 322.
[167] The IRP defines the country's long-term electricity needs and identifies the generating capacity, technologies and costs associated with meeting that demand.
[168] Climate Action Tracker, South Africa, <http://climateactiontracker.org/countries/southafrica.html>
[169] Joseph Tomain, *Ending Dirty Energy Policy: Prelude to Climate Change* (Cambridge University Press 2011), 127.

laws.[170] However in the landmark case of Earthlife,[171] insight was provided to the duality of environmental and the energy law conundrum, proving that the latter does not trump the former in terms of legislature priorities. In addition, government is under a mandatory pre-requisite to consider the substantial risk climate change poses to the sustainability of a climate resilient society as purported in the Constitution and international obligations.

[170] Murombo (Note 165 above), 328.
[171] *Earthlife (Johannesburg) v Minister of Environmental Affairs* [2017] 2 All SA 519 (GP) (8 March 2017).

## Conclusion

To conclude, over the past few decades the continued over reliance on fossil fuels has been the pinnacle of electricity supply as well as economic dominance of its suppliers. Nowadays, the need for alternative sources of energy, from clean and renewable sources, has come to light as not only being important but as being compulsory in the quest to mitigate climate change impacts. To achieve the goal of transforming towards a low carbon energy industry, new trading mechanism, such as policies and regulations at national levels with a focus on market base mitigation mechanisms and promoting energy efficiency, must be open and amenable to the trading of renewable energy technology. This would ultimately promote the implementation of renewable energy worldwide thereby making it more cost-effectiveness due to its increased inclusivity. From a South African perspective, in order to effectively strategize clean energy, legislation has to be reformed to legally oblige government to actively seek environmentally friendly laws as opposed to current policies and regulations which have allowed players such as Eskom, to continue its monopoly over electricity generation. Whether Eskom will continue its undisturbed monopoly as the major electricity supplier in South Africa is still to be seen.

## Bibliography

### Articles


- Aerni, P, et al. "Climate change and international law: exploring the linkages between human rights, environment, trade and investment." German YB Int'l L. 53 (2010) 139.
- Barnard, M. "The role of international sustainable development law principles in enabling effective renewable energy policy-A South African perspective." *PER: Potchefstroomse Elektroniese Regsblad* 15.2 (2012): 01-40.
- Carbaugh, Robert J., and Max St Brown. "Industrial policy and renewable energy: Trade conflicts." *Journal of International and Global Economic Studies* (2012).
- Charnovitz S 'What is international economic law?' (2011) 14 (1) *Journal of International Economic Law*.
- Charnovitz, Steve, and Carolyn Fischer. "Canada–renewable energy: Implications for WTO law on green and not-so-green subsidies." *World Trade Review* 14.2 (2015), 177-210.
- Clemencon, R, "Sustainable development, climate policies and EU-leaderships: A historical-Comparative analysis" (2016) 5 *European Journal of Sustainable Development* 125.
- Clemencon, R, "The two sides of the Paris Climate Agreement: dismal failure or Historic Breakthrough?" (2016) 25 *Journal of Environment and development* 3-24.
- Condon, B, and Tapen S, *The role of climate change in global economic governance*. Oxford University Press, (2013) 22.
- El-Kaltiri, L'The Road to Marrakech: Key Issues for COP22.' *Policy Brief*, OCP Policy Centre, September (2016).
- Ghori, Umair Hafeez. ""Reverse Permissibility" in the Renewable Energy Sector: Going Beyond the US-India Solar Cells Dispute." *Asian Journal of International Law* (2016) 1-28.
- Glazewski, Jan. "The legal framework for renewable energy in South Africa." (2010), 3.
- Joseph Tomain, Ending Dirty Energy Policy: Prelude to Climate Change (Cambridge University Press 2011).

- Keohane, R., and David V. "The regime complex for climate change." *Perspectives on politics* (2011).
- Klass, A, "Climate Change and the Convergence of Environmental and Energy Law." *Fordham Envtl. L. Rev.* 24 (2012): 180.
- Kulovesi, K. "Real or Imagined Controversies-A Climate Law Perspective on the Growing Links between the International Trade and Climate Change Regimes." *Trade L. & Dev.* 6 (2014) 55.
- Kumar, Abhishek, et al. "A review of multi criteria decision making (MCDM) towards sustainable renewable energy development." *Renewable and Sustainable Energy Reviews* 69 (2017).
- 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,* 384.
- Leal-Arcas R. and Alvarez Armas, E., "The climate-energy-trade nexus in EU external relations," in Minas, S. and Ntousas, V. (eds.) *EU Climate Diplomacy: Politics, Technology and Networks*, Routledge (2017),
- Lewis, J. "The rise of renewable energy protectionism: Emerging trade conflicts and implications for low carbon development." *Global Environmental Politics* (2014), 1.
- Murombo, T 'Regulating energy in South Africa: enabling sustainable energy by integrating energy and environmental regulation.' (2015) 33(4) *Journal of Energy & Natural Resources Law* 320-348.
- Narlikar, A "The World Trade Organization: A Very Short Introduction" *The International and Comparative Law Quarterly* (2005) 22–58.
- Pegels, Anna. "Renewable energy in South Africa: Potentials, barriers and options for support." *Energy policy* 38.9 (2010): 4945-4954.
- Pauwelyn, J. "Global challenges at the intersection of trade, energy and the environment." (2010), 4.
- Rajamani, L, "The Durban platform for enhanced action and the future of the climate regime." *International and Comparative Law Quarterly* 61.02 (2012) 501-518.
- Thomaides, A, *Carving our way to a greener future: South Africa's climate change response strategy* (2016).

- Toke, D, and Vezirgiannidou SE. "The relationship between climate change and energy security: key issues and conclusions." *Environmental Politics* 22.4 (2013): 537-552, 547.
- Van de Graaf, T., & van Asselt, H. (2017). Introduction to the special issue: Energy subsidies at the intersection of climate, energy and trade Governance. International Environmental Agreements: Politics, Law and Economics. doi:10.1007/s10784-017-9359-8, 314.
- van Asselt, H, and Kulovesi, K "Seizing the opportunity: Tackling fossil fuel subsidies under the UNFCCC." *International Environmental Agreements: Politics, Law and Economics* 17.3 (2017): 357-370.


**Books**


- Epps, T, and Green, A, *Reconciling Trade and Climate: How the WTO Can Help Address Climate Change*. Edward Elgar Publishing, (2010).
- Glazewski, Jan *Environmental Law in South Africa* 2ed LexisNexis (2014).
- Humby T, Kotzé LJ, Rumble O, and Gilder A, *Climate Change Law and Governance in South Africa* (2016)
- Kidd, Michael *Environmental Law* 2 ed Juta (2011).
- Sands, P and Peel, J, *Principles of international environmental law*. Cambridge University Press, (2012).
- Van den Bossche Peter and Zdouc, Werner *The Law and Policy of the World trade Organisation Text, Case and Materials* 3 edition (2013)


**Case Law**


- Appellate Body Reports, *Canada – Certain Measures Affecting the Renewable Energy Generation Sector / Canada – Measures Relating to the Feed-in Tariff Program*, WT/DS412/AB/R / WT/DS426/AB/R, adopted 24 May 2013
- Appellate Body Report, *India – Certain Measures Relating to Solar Cells and Solar Modules*, WT/DS456/AB/R and Add.1, adopted 14 October 2016
- *BP Southern Africa (pty) Ltd v MEC for Agriculture, Conservation, Environment and Land Affairs* 2004 (5) SA 124 WLD
- *Earthlife (Johannesburg) v Minister of Environmental Affairs* [2017] 2 All SA 519 (GP) (8 March 2017).

- Panel Reports, *EC Measures Concerning Meat and Meat Products (Hormones)*, WT/DS48/R/CAN *(Canada)* / WT/DS26/R/USA *(US)*, adopted 13 February 1998, as modified by Appellate Body Report WT/DS26/AB/R, WT/DS48/AB/R, DSR 1998:II, p. 235 / DSR 1998:II, p. 699


**Legislation or statutes**


- Electricity Regulation Act 4 of 2006.
- Department of Minerals and Energy *White Paper on Energy Policy of the Republic of South Africa* GN 3007 in *Government Gazette* No. 19606, 17 December 1998.56.
- Department of Minerals and Energy *White Paper on Renewable Energy Policy of the Republic of South Africa* GN 513 in *Governments Gazette* No. 26169, 14 May 2004.
- Department of Water and Environmental Affairs *White Paper on the National Climate Change Response* GN 757 in GG 34695 of October 2011.
- National Environmental Management Act 107 of 1998.
- National Energy Regulator Act 40 of 2004.
- National Energy Act 34 of 2008.


**International Sources**


- Agreement on Subsidies and Countervailing Measures, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1869 U.N.T.S. 14.
- Allen, Myles R., et al. "IPCC fifth assessment synthesis report-climate change 2014 synthesis report." (2014).
- Barros VR 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) 1202 et seq
- GATT 1994:General Agreement on Tariffs and Trade 1994, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 187, 33 I.L.M. 1153 (1994) [hereinafter GATT 1994].

- IPCC, 2014: Summary for policy makers. In: *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* [O Edenhofer, Y Sokona (eds.)] Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.
- Pachauri, Rajendra K., et al. *Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change*. IPCC, 2014.
- RK Pachauri, MR Allen, VR Barros, J Broome, W Cramer, R Christ & NK Dubash *Climate change 2014: synthesis report. Contribution of Working Groups I, II and III to the fifth assessment report of the Intergovernmental Panel on Climate Change* (2014)
- Rio Declaration on Environment and Development, in Report of the United Nations Conference on Environment and Development, UN Doc. A/CONF.151/26 (Vol. I), 12 August 1992, Annex I.
- United Nations. FCCC/ CP/2015/L.9/Rev.1. Report on the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 11 December 2015.
- United Nations. FCCC/ CP/2015/L.9/Rev.1. Report on the Conference of the Parties on its twenty-first session, held in Paris from 30 November to 11 December 2015.
- World Commission on Environment and Development *Our Common Future* (the Brundtlan Report) (1987).
- WTO Agreement: Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 1867 U.N.T.S. 154, 33 I.L.M. 1144 (1994)
- World Energy Council, *World energy Trilemma: Defining measures to accelerate the energy transition* (2016)


**Websites**


- Climate Action Tracker, South Africa, <http://climateactiontracker.org/countries/southafrica.html>
- DLA, 'the UNFCCC Paris agreement: impressions from the negotiating table for the energy sector – and 10 Key points about what comes next', 18 December

2015, https://www.dlapiper.com/en/peru/insights/publications/2015/12/the-unfccc-paris-agreement/.

- IPP Procurement Programme, 2012 GN 1074 GG 36005 of 19 December 2012.
- J.A. Montagna Yale-New Haven Teacher Institute. The Industrial Revolution, (2013) <http://www.yale.edu/ynhti/curriculum/units/1981/2/81.02.06.x.html>
- LSE, 'South Africa', <http://www.lse.ac.uk/GranthamInstitute/country-profiles/south-africa/>
- LSE, South Africa', <http://www.lse.ac.uk/GranthamInstitute/country-profiles/south-africa/>
- National Academies Press, Attribution of Extreme Weather Events in the Context of Climate Change, (2016) <https://www.nap.edu/read/21852/chapter/1>
- Reuter, 'India loses WTO appeal in US solar dispute', <https://www.reuters.com/article/us-india-usa-solar/india-loses-wto-appeal-in-u-s-solar-dispute-idUSKCN11M1MQ>
- Renewable Energy Power Producers Procurement Programme <http://www.ipprenewables.co.za>
- Sustainable Development Knowledge Platform, progress of goal 7 in 2017', <https://sustainabledevelopment.un.org/sdg7>
- TIPS, Trade And Climate Change: Exploring The Impact On South African Business, 23 October 2013, <https://www.tips.org.za/events/development-dialogue-seminar/item/2727-development-dialogue-seminar-trade-and-climate-change-exploring-the-impact-on-south-african-business>
- ICTSD, 'Breaking down the barriers to clean energy trade and investment <https://www.ictsd.org/bridges-news/biores/news/breaking-down-the-barriers-to-clean-energy-trade-and-investment>
- The Conversation, 'How trade policies can support global efforts to curb climate change', <https://theconversation.com/how-trade-policies-can-support-global-efforts-to-curb-climate-change-81029>
- UNFCCC, 'First steps to a safer future: Introducing The United Nations Framework Convention on Climate Change' <http://unfccc.int/essential_background/convention/items/6036.php>
- UNFCCC, 'Kyoto Protocol', <https://unfccc.int/kyoto_protocol/items/2830.php>.

- UNFCCC, 'Making those first steps count: An Introduction to the Kyoto Protocol'. <http://unfccc.int/essential_background/kyoto_protocol/items/6034.php>.
- UNFCCC 'Joint Implementation (JI)' <http://unfccc.int/kyoto_protocol/mechanisms/joint_implementation/items/1674.php>
- UNFCCC, 'International Emissions Trading' <http://unfccc.int/kyoto_protocol/mechanisms/emissions_trading/items/2731.php>
- UNFCCC, 'Clean Development Mechanism' <http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php>
- UNFCCC, 'The Mechanisms under the Kyoto Protocol: Clean development mechanism, joint implementation and emissions trading', <http://unfccc.int/kyoto_protocol/mechanisms/items/1673.php>
- World Trade Organisation 'The multilateral trading system and climate change: introduction' <https://www.wto.org/english/tratop_e/envir_e/climate_intro_e.htm>
- WTO, 'Principles of the Trading system', <https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact2_e.htm>
- WTO, 'WTO rules and Environmental policies: Introduction <https://www.wto.org/english/tratop_e/envir_e/envt_rules_intro_e.htm>
- WTO, 'WTO rules and environmental policies: GATT exceptions' <https://www.wto.org/english/tratop_e/envir_e/envt_rules_exceptions_e.htm>
- WTO, 'Doha Round', <https://www.wto.org/english/tratop_e/dda_e/dda_e.htm>
- WTO, 'An introduction to trade and environment in the WTO' <https://www.wto.org/english/tratop_e/envir_e/envt_intro_e.htm>
- WTO, 'the multilateral trading system and climate change: introduction', <https://www.wto.org/english/tratop_e/envir_e/climate_intro_e.htm>
- A CISDL Legal Brief. 'The Principle of Common But Differentiated Responsibilities: Origins and Scope'. (2002). <http://cisdl.org/public/docs/news/brief_common.pdf>.
- World Trade Organisation 'COP22: Geneva agencies highlight important role of trade in addressing climate change' <https://www.wto.org/english/news_e/news16_e/envir_12nov16_e.htm>

- WTO, ‘relationship between international trade and energy’ <https://www.wto.org/english/res_e/publications_e/wtr10_richards_herman_e.htm >.
- WTO, ‘Eliminating trade barriers on environmental goods and services’ https://www.wto.org/english/tratop_e/envir_e/envir_neg_serv_e.htm
- WTO, ‘Regional trade agreements’, <https://www.wto.org/english/tratop_e/region_e/region_e.htm>
- WTO, ‘Relationship between international trade and energy’, <https://www.wto.org/english/res_e/publications_e/wtr10_richards_herman_e.htm >