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POLICY OPTIONS FOR THE ENERGY SECTOR IN MAURITIUS

MBA

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Declaration

I, Didier Philogène, declare that this research report is my own, unaided work. It is submitted in partial fulfilment of the requirements for the degree of Masters of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any other university.

ABSTRACT

The objectives of this research were to identify the main issues which affect and influence policy decisions in the energy sector in Mauritius. The study aims at providing valuable insights to reinforce the energy sector while supporting economic growth.

A qualitative survey using in-depth, semi-structured interviews was used as a research instrument for collecting data. The sample frame consisted of people from four stakeholder groups namely Regulatory Bodies, Experts and Consultants, Independent Power Producers and people from Industries. The findings obtained during the personal interviews were presented in the form of tables for each of the stakeholder groups. Then the content analysis method was used for the interpretation of the data collected. The patterns and trends that emerged were analysed and discussed to answer the research problem and hence used to address the research propositions.

The research revealed that the major problems affecting the energy sector are of three folds, namely, economic, environmental and strategic. Various solutions, with regards to these three sectors have been proposed by the respondents to address the main issues influencing the energy sector. It has been surprising to note that no major differences in the opinions expressed by the respondents among the different stakeholder groups were observed. In fact, they have more or less identified the same problems in the Energy Sector in Mauritius and the suggestions proposed were oriented towards the same objectives.

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1 INTRODUCTION

1.1 Context of the Study

Mauritius has been through various stages in its development since its independence in 1968. Through these stages, it has maintained an average GDP growth rate of 5.6%, with peaks of 7% in exceptional years as mentioned by the National Long-Term Perspective Study -Vision 2020 (2000).

During the past 35 years, the country has had to face three major world oil crises in 1973, 1980 and 1990. The first oil crisis hardly had any impact on Mauritius, whereas the two others were followed by difficult recovery phases for this country. The reaction of Mauritius to these crises was mainly to elaborate a plan for energy supply out of bagasse, the fibre content of sugar cane and residue of sugar production process (BEDP, 1991). Mauritius has no indigenous energy resources and is highly dependent on fossil fuels. The energy situation during this period made Mauritius very vulnerable to changes in energy supply.

This caused a positive shift on the overall power production where 20% of the yearly energy requirements came from bagasse, the local renewable source of primary energy in 2003 (CEB strategic plan, 2003).

During the industrialisation years (textile and export processing zone), the energy demand in the industrial sector grew rapidly and as well as in the hotel and tertiary sectors (Baguant, 1992). Mauritius realised the importance of implementing a solid energy strategy in order to sustain the growth of the economy (Baguant, 1992). With

the slow shift of the economy form industrial based to a service-based one, the growth rate of the energy demand has dropped (CEB strategic plan, 2003).

However, the Vision 2020 study stresses the fact that energy demand will continue to grow on a steady rate due to the increase of the GDP per capita of Mauritius.

1.2 Purpose of the Study

The purpose of this study is to determine the issues that will impact on the policy decision in the energy sector in Mauritius. The study is carried out in the Mauritius context and aims at providing valuable insights for strengthening the energy sector in order to support its growth.

1.3 The Research Problem and Sub-problems

1.3.1 The Problem

The research will identify and determine the key issues that will impact on the policy decisions in the energy sector in Mauritius. The research also identifies the strategic options that would allow Mauritius to meet the challenges of its further growth and development.

1.3.2 The Sub Problems

The research problem can be broken in three separate sub-problems stated as:

- **Sub-problem 1:** To identify the key issues relating to the energy sector in Mauritius
- **Sub-problem 2:** To determine how these key issues will affect the energy policy decisions in Mauritius
- **Sub-problem 3:** To clarify the strategic options that would allow Mauritius to meet its challenges in the energy sector

1.4 Significance of the Study

This study is relevant for Mauritius as energy costs have a direct impact on inflation and cost of production/running costs in most industries, from Manufacturing to IT, Hotel and Tertiary Sector. The growth of the economy cannot be sustainable without an in-depth rethinking of the energy policy of the country in order to minimise the overall energy costs and also dependency on fossil fuel. Most heavy industries depend on electric and fossil fuel energy and most IT industries depend on the stability of the electrical network. Solving the energy problems in the long term is therefore vital for attracting future investments and for the economic growth of the Island.

1.5 Delimitations

The research has been focused on Mauritius. Literature review has been conducted in Small Island Developing States, being given their similarities with Mauritius. Literature review has also been conducted in a limited number of developed countries to evaluate energy policy decisions that could give insights into the study. The limited number of countries has restricted the research, as studying other countries would have given better insights into the overall research and could probably have generated new ideas. The research has mentioned other factors proper to each country that have influenced their growth, but has not included these factors in the analysis of the figures, and considered energy cost as the most important common obstacle. The study has been conducted using the "survey by interview method" and the results have been analysed by the content analysis method (Leedy & Omrod, 2001), with a sample size of 30 persons.

1.6 Assumptions

The following assumptions have been made throughout this study:

- Although the different experts have different measures for identifying the key issues related to the energy sector in Mauritius, this has not influenced the validity of the study.
- Information gathered has been through a complete literature review and data collection on world reputed databases and through a survey on a sample of experts.
- The techniques and instruments being used have enabled analysis of data to be done without loss in reliability.

- The list of issues that the panel have developed will be fully inclusive of the situation within the selected Mauritian energy sector.
- The participants' views have been representative of the views of the sectors to which they belong
- There has been no overall bias brought about by the number of the panel members or the organisations that they represent.
- Participating persons in the survey have sufficient knowledge of the subject to provide an informed view.

2 LITERATURE REVIEW

2.1 Energy and Social Development

Poverty is one of the greatest challenges facing the world today (Batliwala, 1999:1) While growing pockets of poverty are visible even in the industrialized world, "the fundamental reality of developing countries is the poverty of the majority of human beings who live in them" (Goldemberg, 1998). Whether measured in terms of nutrition levels, health and education status, income and employment, or quality of shelter, a majority of people in the developing world exist at sub-standard levels, where the struggle for daily survival is unending (Batliwala, 1999:1).

Batliwala believes that it is tempting to associate poverty with inadequate energy consumption, but to simply correlate these two conditions obscures the fact that the poor use energy very inefficiently, primarily because the technologies available to them are inefficient (Batliwala, 1999). This opens the debate on whether to tackle the energy problem, on the production side or on the usage side.

In the face of inadequate energy and lack of access to efficient technologies of energy use, the poor are forced to depend on their own labour, animal power and biomass energy resources to meet their survival needs. Poverty and scarcity of energy services go hand in hand, and exist in a synergistic relationship. (Batliwala, 1999)

Recognizing the importance of this relationship increases the range of options for addressing poverty; the goal must become not just increasing the magnitude of energy consumption, but also (and even more importantly) improving the efficiency of energy utilization. To reduce poverty and improve living standards, energy services must be dramatically augmented (Batliwala, 1999). This is the challenge that is aggravated by growing populations already facing shortages of inanimate energy. Failure will contribute to perpetuating poverty, and success can lead to the achievement of equitable, ecologically sound and sustainable development (Batliwala, 1999)

For the poor, a better life first means satisfying the basic human needs, including access to jobs, food, health services, education, housing, running water, sewage, etc. In providing for these needs, energy is an important element (Goldemberg, 1988). Energy is of little interest in itself. However, it is an essential ingredient of socio-economic development and economic growth. The objective of the energy system is to provide energy services. Energy services are the desired and useful products, processes, or services that result from the use of energy, for instance, illumination, comfortable indoor climate, refrigerated storage, transportation, appropriate temperatures for cooking, materials, etc (Goldemberg, 1988).

The importance of energy in socio-economic development was first emphasized in work of the Bariloche Foundation in Argentina that pioneered studies on the role of energy in socio-economic development, using the Latin American World model (Fundaci, 1976).The energy requirements of this approach have been developed further to estimate the energy requirements to satisfy basic human needs (Krugmann ,1983).

Energy in itself is not a basic human need. It is an imperative element required in meeting any basic needs, hence a driver of development (Goldemberg, 1988).

Ross Ferguson, in his research on more than 100 countries has established a direct relationship between electricity consumption (and total primary energy) per capita and GDP per capita (Ferguson, 2000). The general conclusions of his research are that wealthy countries have a stronger correlation between electricity use and wealth creation than do poorer countries and that, for the global economy as a whole, there is a stronger correlation between electricity use and wealth creation than there is between total energy use and wealth. The shift from other forms of energy use to electricity increases with wealth (Ferguson, 2000).

2.2 Energy as a driver of Growth

Over the past few years the relationship between energy consumption and economic growth has been studied extensively using modern advances in time series econometrics of co-integration and causality – Shanghai (Wolde-Rufael, 2003).

The relation between Energy demand and GDP depends on the nature of the economy of a country. For instance, the growth of an agriculturally based economy would have less impact on the energy demand than that of an industrial based one. Jumbe (2004) found bi-directional causality between KWh and GDP for Malawi. However, the impact of growth on energy demand for Malawi is not clearly established as the economy is mainly agricultural, and the agricultural sector does not depend on electricity as revealed by the earlier results that established no co-integration between electricity consumption and agricultural GDP (Jumbe, 2004).

In Grenada, the power sector is fully dependent on fossil fuel imports for meeting the country's electricity demand. Electric utilities in Small Island Developing States (SIDS), in general, face high cost of electricity generation due to diseconomies of scale in production, consumption and logistical aspects. Grenada's private power monopoly is no exception and the high cost of import electricity generation places an increasing burden on economic development (Weisser, 2004). For industrialized countries, there is an intimate relation between their energy demand and their industrialized level or their GDP per capita index. Energy demand per capita is often a rapid index for the level of industrialization of a country. Wolde-Rufael (2004) concluded that there is uni-directional causality running from total energy to real GDP for Shanghai. Wahkeun & Lee (2004) came to the same conclusion for Korea. The empirical results for the case of Korea suggest the existence of a long run causal relationship between energy and GDP.

Ferguson (2000) studied the relationship between electricity use and economic development in over one hundred countries and confirmed the correlation between electricity and total energy use with wealth.

Shiu & Lam (2004), however, mention the very interesting phenomena of decoupling electricity consumption and GDP growth that has been achieved in China as a result of improvement in national energy consumption efficiency. This phenomenon is very important as it demonstrates a potential solution for countries facing problems of energy resources to sustain their growth.

2.3 The Context of the Small Islands Developing States

Weisser (2004) suggests that the link between GDP and energy demand for Small Island Developing States (SIDS) is well established. The similarity of SIDS lies in the fact that they are mostly dependent on fossil and imported fuel and that most of these countries are in the developing stage and therefore need to define a unique energy policy to sustain their growth.

The electricity generation of SIDS is primarily based on fossil fuels, creating serious economic and financial difficulties (Weisser, 2004). It is believed that renewable energy technologies have the potential to reduce the cost of current modes of electricity generation. This is primarily due to an abundance of renewable energy resources and characteristics specific to SIDS that make fossil-fuel-based electricity production extremely expensive.

At present most SIDS are highly dependent on the import of fossil fuels for electricity generation. The combined effect of high transport costs for fossil fuel imports, a limited demand for fuels domestically and diseconomies of scale in electricity production, not only makes power production extremely expensive but also incurs financial risks in the long term (Hoyle, 1999).

Since many of these SIDS have outstanding debts (Kleinpeter, 1995), the provision of further energy services could cause serious debt-related and macroeconomic stresses, particularly when considering the expected increase of developing countries' share of total world energy demand (Goldemberg, 2000). Furthermore, in many countries, the capital-intensive power sector accounts for the single largest fraction of public investment, so the provision of electricity is an area of great concern (Munasinghe & Mayer, 1993). Also, there is evidence that electricity demand has outpaced GDP

growth over the past decade, reflecting the continued importance of electricity for economic development (United Nations Economic and Social Council, 2001).

However, the introduction of renewable energy systems presents some difficulties. In the South Pacific Islands the difficulties are related to scarcity of capital resources, shortage of skilled human resources and inappropriate institutions (Xiaojiang, 1997). Furthermore, the costs of electric power projects utilizing renewable energy technologies are highly sensitive to financing terms and a carefully designed renewable energy policy needs to be put in place to favour the development of these renewable energy technologies (Wiser & Pickle, 1999).

As a result of these difficulties, most SIDS members are still heavily dependent on fossil fuels for their energy requirements (Jafar, 1999), thus impacting directly on their economy growth.

2.4 The Case of Mauritius

From the works and findings from Harel (1989), the theory of the Energy/GDP relation has been well established, and it is on this basis that the research will be conducted in order to find milestones in the GDP growth, when it becomes of utmost importance to find a major breakthrough in the energy policy of a developing country similar to Mauritius. (Harel, 1989).The graphs shown next page, (CSO, 2003) depict the increase in GDP growth and Energy demand in Mauritius for the last few years.

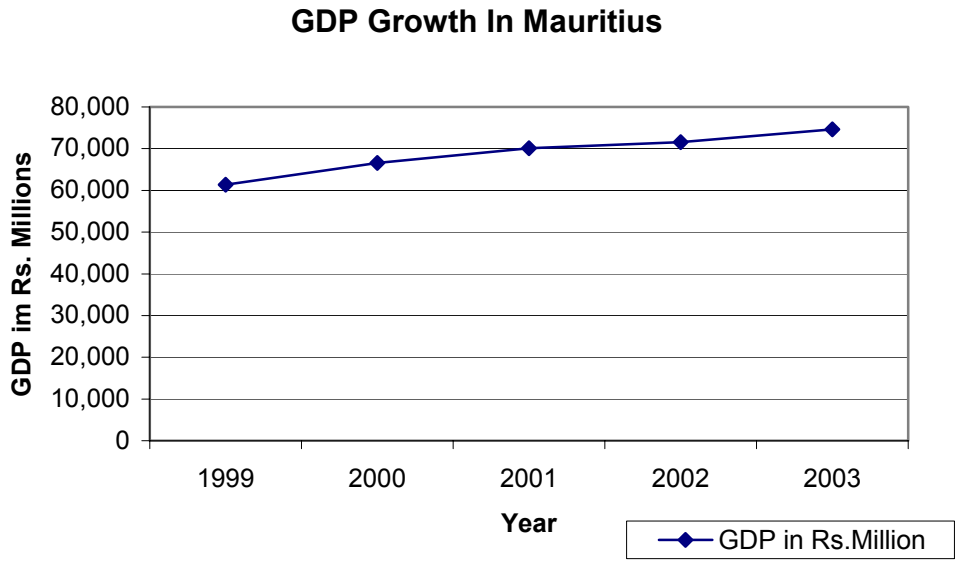


Figure 1

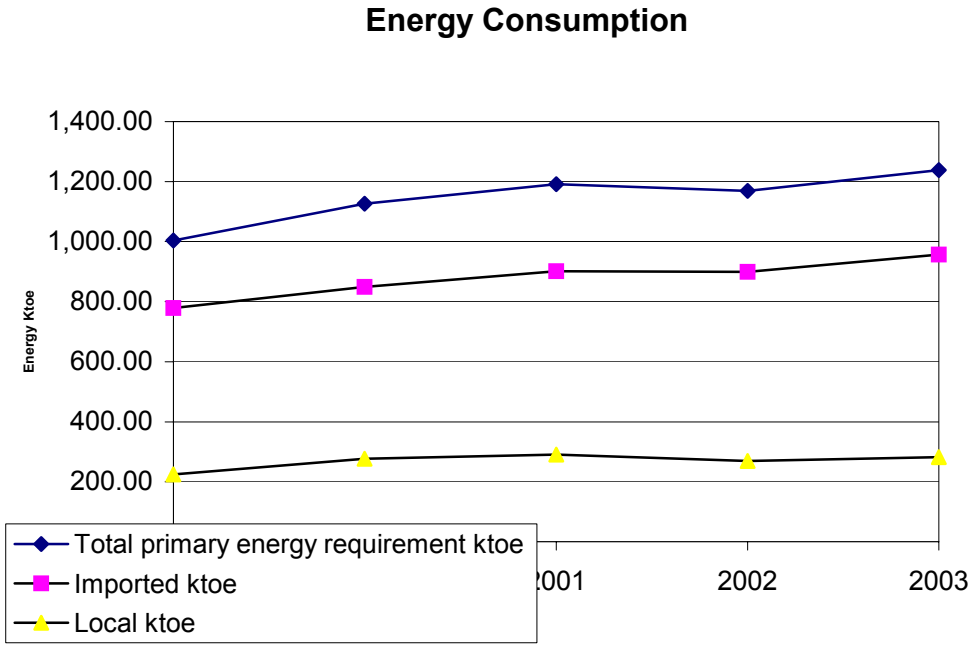


Figure 2

From the trend in both the GDP growth and Total Energy Demand curves, it can be seen that there is some direct relationship between the two.

In 1975 the GDP of Mauritius was 1000 USD per capita and the total energy demand was 1.15 TOE (tone equivalent of energy) per capita (Baguant, 1990). Mauritius was at that time an agricultural economy (mainly sugar) with the following GDP repartition in 1975:

- **Agriculture……..:** **30%**
- **Industry……...:** **34%**
- **Tourism……:** **10 %**
- **Financial services…….:** **10 %**

After the first oil crisis of 1973, the reaction of Mauritius was quite limited as the impact on its economy was not significant, the country being an agriculture-based economy at that time. The mid 70's oil crisis also coincided with the sugar production record of 640,000 tonnes in 1975 (still a record up to now) with very good sugar prices (PROSI, 2001). This year is still known as the "Sugar Boom" year.

In the 80's, however, Mauritius innovated in its economy and started the Export Processing Zone, composed mainly of an extensive textile industry. Under the impulsion of visionary leaders, tourism industry began its development during this period. The Mauritian economy then started to shift from agricultural to a mixed economy composed of Agriculture – Textile – Tourism. In 1985, the GDP of Mauritius reached 1500 USD per capita and the total energy demand was 1.85 TOE per capita (Baguant *et al*., 1994)

The GDP repartition was then:

- **Agriculture……..: 14 %**
- **Industry……: 34 %**
- **Tourism……: 17 %**
- **Financial services…….: 18 %**

When the early 1980's oil crisis hit Mauritius, the impact was then very different. Oil prices to the end users (transport, power plant) increased and the impact on overall cost of living was important.

The Mauritian government only then realised the importance of energy for the Island and started to find other solutions in order to reduce dependency on oil by developing renewable energy technologies. Energy from Cogeneration was then developed at the FUEL Sugar Company in 1983, using the sugar cane process residue called bagasse (Harel, 1989). This FUEL power plant gave satisfaction in terms of the technology involved and also enabled to reach partly the national target of reducing the dependency on fossil fuel. A bagasse drying and densifying plant project followed the FUEL project in 1985. The aim of this technology was to increase the energy output from bagasse and stock it as a fuel (since bagasse cannot be stocked for a long time if not conditioned). Unfortunately, this project failed for technical reasons and the whole idea of "bagasse cogeneration energy" was then stopped.

In the meantime, industrialization of Mauritius progressed rapidly and tourism industry became important. In 1995, the GDP of Mauritius reached 2500 USD per capita and the total energy demand was 3.7 TOE per capita (CEB strategic plan, 2003).

According to the paper (Government of Mauritius, 2000), the GDP repartition was then:

- **Agriculture……: 10 %**
- **Industry……..: 45%**
- **Tourism……..: 20 %**
- **Financial services……..: 18%**

Energy demand became a very important component of the economic context and the early 1990's oil crisis had important repercussions for Mauritius. The "Bagasse-Cogeneration Energy" concept came up again through the "Bagasse Energy Development Program" (BEDP) in 1991. The BEDP clearly elaborated a policy to encourage and offer incentives to the sugar industry to produce electricity from bagasse and cogeneration. This led to new power plants and really launched the development of bagasse-cogeneration power plants throughout the Island.

In 2002, the bagasse energy reached 8% of the national electricity demand (CSO, 2002) and it is projected to progress up to a maximum of 12% in the years 2010 (CEB strategic plan, 2003).

However, bagasse energy only tackles the problem of electricity generation on a medium term but not that of energy requirements for other applications like transport and industrial needs, which, due to the continued development of Mauritius, are also very important parameters to consider.

2.5 The Issues Related to the Energy Sector in Mauritius

A change in energy policies and structure of electricity planning has been necessary in some member countries of the SIDS in order to sustain growth. So far, energy policies aiming to promote RET (Renewable Energy Technologies) in member countries of the SIDS have neglected to study the immediate and future technological feasibility of such programs. However, this has serious implications on the cost of electricity supply systems and need to be considered alongside the dynamics of energy markets to allow capturing economic risks and also benefits in the long term (Weisser, 2004). Mauritius is targeting a GDP of 6200 USD/capita in 2020 and energy demand is planned to rise by average 4% annually (Harel, 1989). The importance of getting the energy policy right is therefore two fold: Strategic and Economic.

2.5.1 Strategic Issues

Mauritius aims at increasing its Foreign Direct Investment (FDI) further during the next decade (Vision 2020). In order to achieve this, Mauritius needs, amongst other measures, to lower utilities costs so as to reduce operational costs of the business operations. In view of the lack of fuel resources, SIDS members have to move out from an industrial economy to a service-based economy (Weisser, 2004). Mauritius is launching new sectors, such as offshore banking, IRS (Integrated Resorts Schemes) and IT sector which will favour a shift to less energy consuming economic activities. However, stability of the energy production and distribution system will still be very important.

Furthermore, the successful achievement of China in reaching a decoupling of the GDP/Energy demand causality (Xiaojiang, 1997) in order to reduce the effect of GDP growth on energy demand should inspire the SIDS, including Mauritius. SIDS including Mauritius, should also seek to reduce dependency on fossil fuels and therefore minimise potential impacts of any future oil crisis on their economy.

The renewable energy technologies (RET) and rational use of energy resources (energy efficiency measures) are measures that can contribute to the decoupling of the two related factors. The effect of economic growth and increase in purchasing power will tend to reinforce the GDP/Energy demand relation, and a policy definition for RET and energy efficiency is therefore crucial in order to counteract the tendency of reinforcement of the GDP/Energy demand coupling.

SIDS members have biomass, solar and wind as natural resources and the difficulties of the RET implementation will have to be overcome, through the experiences of the counties that have been successful in the RET (Geller *et al*, 2004)

2.5.2 Economic Issues

The Economics issues for SIDS (NIUE, 2003) are related to:

- Importance of reducing the importation of fossil fuel: Fossil fuel is costly and dependent on many external factors. Oil crisis, developments of other economies, geo-politics are some concerns that affect prices of fossil fuel. Recently, the boom in the Chinese economy has created lots of pressure on the price of coal, influencing the price of coal reaching Mauritius by as much as 40%.
- Importance of reducing the expenditure on foreign currency for the purchase of imported fuel: Expenditure on Fossil fuel causes an imbalance in the Mauritian

balance of payments. Foreign currency earnings are very important for the economy of a SIDS member and any reduction in foreign currency earnings is therefore a very important achievement.

- Importance of reducing the impact of energy on cost of other commodities: Many services and commodities depend on the energy price. Transport, food, services are such examples. An increase in energy cost has therefore direct impact on inflation and the country should therefore aim at reducing the impact of energy on the economy.

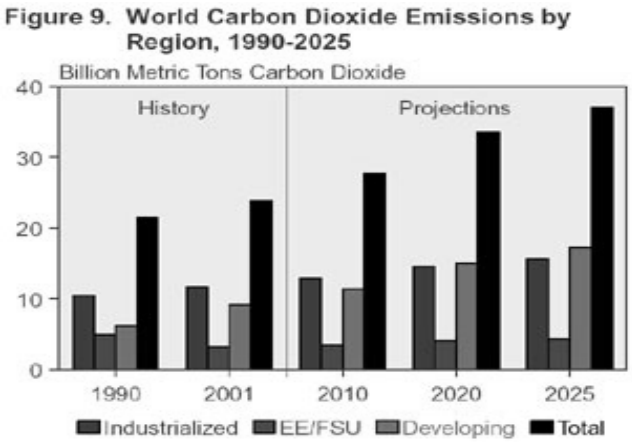
2.5.3 Environmental Issues

It is widely believed that there are strong links between the use of fossil energy and global environmental problems such as global warming, (Lewandowski, 1995).

Carbon dioxide is one of the most prevalent greenhouse gases in the atmosphere. Anthropogenic emissions of carbon dioxide result primarily from the combustion of fossil fuels for energy use, and as a result world energy is at the core of the debate on climate change (International Energy Outlook, 2004)

Much of the projected increase in carbon dioxide emissions is expected in the developing world (graph below), accompanying the large increases in energy use projected for the region's emerging economies. Developing countries account for 61 percent of the projected increment in carbon dioxide emissions between 2001 and 2025. Continued heavy reliance on coal and other fossil fuels, as projected for the developing countries, would ensure that even if the industrialized world undertook efforts to reduce carbon dioxide emissions, there would still be substantial increases in worldwide carbon dioxide emissions over the forecast horizon. (International Energy Outlook, 2004)

Figure 3



Sugarcane biomass is one alternative to fossil fuel combustion for power generation and is part of a larger bio energy strategy for coping with mitigation of greenhouse gas (GHG) emissions. With the utilisation of sugarcane bio energy systems, the net amount of carbon dioxide released per unit of energy produced is significantly lower compared to other fuels. With cane energy, Mauritius, being a signatory member of the Kyoto Protocol, can achieve sustainable development while complying with emission reduction targets of the United Nations Framework Convention on Climate Change, (UNFCCC).

2.6 Strategic Policy Options for Mauritius

Many studies have been carried out on the use of bagasse as a fuel for electricity generation. Proposals have been made for energy generation during the crop season and for energy storage (through pump-hydro method) to smooth the energy supply curve (Harel, 1989). GDP/Energy demand relations have also been studied for

Mauritius (Baguant, 1994) and proposals have been made for bagasse power plants. The notion of decoupling was introduced by Harel (1989) in Mauritius with regards to electricity demand only. This present research aims at handling the total energy demand rather than just electricity.

Alexander (1985) made further propositions for cane-to-energy alternatives but these also address only electricity generation. It is assumed that the bagasse-to-electricity options have been fully addressed and Mauritius should go further ahead and investigate the possibilities of shifting part of the cane industry from sugar production to energy production in the form of electricity and ethanol.

Brazil has been able to create a reduction in the fossil fuel imports (petrol and diesel) by using cane to produce ethanol rather than sugar (Macedo, 2001). The size of the economy of Brazil however is such that the importance of the ethanol production is less marked that it could be for Mauritius. Brazil also has significant hydro electric capacity, which makes it less vulnerable (Geller et al, 2004).

Presently, ethanol is produced from molasses (sugar cane process residue) in low volumes only for the drinking alcohol industry. Production of crude industrial ethanol from sugar cane juice causes the volume to increase tremendously, and the impact of this production on the Mauritian economy will be investigated.

All these studies elaborate on measures to increase energy production being given that energy is a driver for growth. Kuhn (2002) relates to a group of energy specialists who were opposed to the fact that energy consumption was considered to be necessary for increase of GDP. Goldemberg (1988) elaborated on a new energy paradigm where energy is seen for the requirement side and not the production side. One should start asking why humans need energy and how they use it (Patterson, 2001). This new

perspective opens discussions on efficiencies, optimisation and rational use of energy and sustainable development.
In the World Summit on Sustainable Development in 2002, emphasis was on renewable energy, modern clean energy and sustainability of energy (Spalding-Fischer, 2005).

2.7 Research Propositions

The research propositions addressed in this study are as follows:

- Energy is strongly related to economic growth
- Mauritius energy policy will have to identify and take care of external factors
- Mauritius energy sector is too much dependent on import fuel.
- The situation in the Energy sector in Mauritius will result in a shift to a service-based economy.
- Solving energy problems always start from the consumption and efficiency side
- Renewable energy resources (RET) represent an opportunity for Mauritius
- Options should all be focused on achieving an energy/growth decoupling.

These propositions have been the basis of the questions discussed during the interview.

3 RESEARCH METHODOLOGY

3.1 Method

The method of research proposed for this study is structured in-depth interviews with all stakeholders in the energy sector in Mauritius. The sample group has covered the people in the regulatory bodies (Ministries and Authorities), the national electricity utility company, the private power producers and the people active in various industries in which energy is considered as a critical factor

The researcher has also sought information from experts and consultants closely involved in the energy sector. Qualitative research is narrative-oriented and makes use of the content analysis method for analysis of findings. This type of research focuses on the understanding of research phenomena in situation; that is, within their natural-occurring context(s). In general, qualitative research studies rely on three basic data collection techniques which are: participant observation, interview and document or artifact analysis (Wolcott, 1995, 1999). Hence, the goal of this type of research is not to estimate statistical parameters but to generate hypotheses which will be tested quantitatively.

In-depth interviewing is a type of interview which researchers use to elicit information in order to achieve a holistic understanding of the interviewee's point of view or situation. It can also be used to explore interesting areas for further investigation. In-depth interviews are used to determine individual's perceptions and opinions, facts and forecasts and individuals' reactions to initial findings and solutions. This type of interview involves asking informants open-ended questions, and probing wherever

necessary to obtain data deemed useful by the researcher. As in-depth interviewing often involves qualitative data, it is also called qualitative interviewing.

However, while using in-depth interviews, researchers should ensure that details are not overlooked and that data is reported as objectively as possible.

The advantages of in-depth qualitative research on relatively small samples are well documented in the social science literature when the intention is to generate information about complex social dynamics which cannot be accessed using quantitative survey questionnaires (Miles & Huberman, 1994). The interest of the structured interviews is that, although the interview revolves around a few central questions, the researcher can shift focus as new issues come to light. (Leedy & Omrod, 2001: 158).

However, the researcher must be careful as he may alter what people say and how events unfold.

The local players of the supply chain, namely trading companies, freight forwarders and business customers, will be interviewed using structured In-depth interviews. The information gathered by the researcher will cover the rationale behind the research questions and will be compared to the propositions as supported by the literature review.

3.2 Population

The population in this research has been considered to be all the specialists, producers and decision makers that are engaged or have participated in sector of energy to the extent that they can deliver expert opinion on the energy policies for Mauritius. The sample consists of a panel drawn from Authorities (Ministry and Institutions),

consultants, Central Electricity Board members Independent Power Producers, economists and strategic thinkers that can be accessed by direct mail.

In drawing the panel, the objective is to ensure that the subject is adequately covered, whilst avoiding uniformity of response introduced by any biased panel membership. The main criteria in selecting the group have therefore been expertise and diversity.

3.3 Sample

In elaborating the sample, the aim is to ensure that the subject is well covered in all aspects that the research targets. The main criteria in selecting the group have therefore been expertise and creativity. As far as the size of the group is concerned, the research targets at retaining no fewer than thirty experts that can actively participate in the debate. The research has also concentrated on the following stakeholder groups in the energy sector as it has been interesting to try to analyse different views on the subject based on the stakeholder group.

- **Regulatory Bodies**
- **Power Producers**
- **Experts and Consultants**
- **Industries**

A sample of some 30 people has been selected based on their expert knowledge on the subject and also on the quota allocated to each stakeholder group. A stakeholder group has been defined as covering all domains of energy, from policy to production, distribution, environment aspects, and rational use of energy.

A preliminary list of experts per group has been established as follows:

- **Government bodies: 5 Nos.**
    - **Ministry of Public Utilities (2 nos.)**
    - **Ministry of Economic Development (1 no)**
    - **Prime Ministers Office (1 no)**
    - **Ministry of Environment (1 no)**
- **University of Mauritius: 2 Nos.**
- **Central Electricity Board: 3 Nos.**
- **Independent Power Producers: 7 Nos.**
- **Sugar Sector: 5 Nos.**
- **Independent Experts - Consultants: 3 Nos.**
- **Private Sector: 5 Nos.**
    - **Manufacturing**
    - **Hotel Industry**
    - **ICT**

The quota allocated to each stakeholder group is based on judgement and also on the importance that the researcher attaches to each stakeholder group in the analysis of the energy sector.

3.4 Data collection

The various people targeted have been invited to participate though a letter explaining the purpose and interest of the research, as well as the importance of their participation. Upon receipt of their approval, the main themes of the interview have been mailed to them to allow them to get prepared for the interview. Points that form part of the

interview schedule might demand in depth thinking that may not be possible during the interview.

The interview has taken place following the steps of the interview schedule whilst leaving space to the respondent to cover other fields of interest for the research.

The interview has been recorded with permission of the respondent in order not to disturb the flow of the interview through notes taking.

The interview has been summarised in writing. The interview document has been sent to the respondent for validation before proceeding further with the analysis.

3.5 Data analysis

Bogdan and Biklen (1982, p.145) have defined qualitative data analysis as "working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others" . Indeed many researchers tend to use inductive analysis of data which lead to the identification of critical themes. (Patton, 1990). Qualitative analysis requires some creativity, for the challenge is to place the raw data into logical, meaningful categories; to examine them in a holistic fashion; and to find a way to communicate this interpretation to others.

3.5.1 In-depth Interview Analysis

Transcripts from the in-depth interviews with respondents have been content-analysed. The researcher has identified patterns and trends that are reflected by the data and these have been grouped together. The groups have been reported as completely and as unbiasly as possible.

The results have then be connected to the propositions. These either support or confirm existing theory or may in the other case not confirm theories highlighted by literature reviews.

3.5.2 Content Analysis

Content analysis is a method that uses a set of categorisation procedures for making valid and replicable inferences from data to their content (Palmquist, 1980).

The Content Analysis is structured as follows:

- **Coding.**
- **Categorising and Classifying.**
- **Comparing.**
- **Concluding.**

The advantages of Content Analysis are as follows:

- Looks directly at communication via texts or transcripts, and hence gets at the central aspect of social interaction

- Can over time provide valuable historical/cultural insights through analysis of texts
- Allows a closeness to text which can alternate between specific categories and relationships and also statistically analyses the coded form of the text
- Can be used to interpret texts for purposes such as the development of expert systems (since knowledge and rules can both be coded in terms of explicit statements about the relationships among concepts)
- Provides insight into complex models of human thought and language use
- When well done, is considered as a relatively "exact" research method.

However, the researcher must be careful with the analysis and be aware of the disadvantages of Content Analysis:

- Is subject to increased error, particularly when relational analysis is used to attain a higher level of interpretation
- Is often devoid of theoretical base, or attempts too liberally to draw meaningful inferences about the relationships and impacts implied in a study
- Is inherently reductive, particularly when dealing with complex texts
- Tends too often to simply consist of word counts
- Often disregards the context that produced the text, as well as the state of things after the text is produced
- Can be difficult to automate or computerise.

In the case of this research, Creswell's (1998) data analysis spiral was used as described in Leedy & Omrod (2001: 161). The following steps were taken:

- The data was organised into a computer database, breaking down into sentences or units.

- The data will be perused several times in order to get a larger picture. Possible categories and interpretations will be noted.
- General categories, themes or groupings will be noted as well as sub-themes or categories if they should emerge. This should indicate patterns of “what the data means”.
- Data will then be integrated and summarised. The categories will be organised to relate back to propositions.

3.6 Validity and Reliability

High levels of validity and reliability are important in a research. Validity refers to the accuracy of the study; and reliability can be defined as "the consistency with which a measuring instrument yields a certain result when the entity being measured hasn't changed" (Leedy & Omrod, 2001:31).

3.7 External validity

In order to ensure that a research can be generalised across persons, one would ideally have a random and representative sample. In the proposed research, although the tests were not carried out to verify randomness, the need for diversity and full cover were taken care of. The panel of participants will be drawn from experts in their relative fields and would target high- level executives.

3.8 Internal validity

For the proposed research, the content validity was essential; that is, ensuring that the topic was fully covered. To achieve that, the research questions were fully discussed with the research supervisor. That was even to the extent that a small panel of prospective participants could be requested to give opinion on their understanding of what would be asked.

The construct validity was attempted through the questions on which the respondents were requested to elaborate and justify their choices. The summaries at each stage were therefore generated with the above aspects in mind. Also, the summarised factors were communicated back to the participants and they were in a position to confirm the retention of the meaning.

3.9 Reliability

In order to enhance the reliability of the study, some definitions and explicit explanations were considered for this research when communicating with the respondents. The responses were split in half and analysed separately to verify if there was convergence. Another element that was considered was sending out questionnaires with different sequences of the issues to be ranked.

4 RESEARCH FINDINGS

This chapter presents the findings obtained during the individual interviews carried out with the different stakeholder groups. The content analysis method was used to analyse the interview transcripts and findings were presented as per the order of the questions in the questionnaires. The tables show the themes that emerged during the analysis of the answers from the various respondents. However, discussion of the findings obtained was made in the next chapter.

1. What are your perceptions about the relations between growth and energy demand?

REGULATORY BODIES

Description	N=3	Percentage %
There is a direct relationship between growth and energy demand	3	100
There is no direct relationship between growth and energy demand	0	0

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
There is a direct relationship between growth and energy demand	4	80
There is no direct relationship between growth and energy demand	1	20

POWER PRODUCERS

Description	N=8	Percentage %
There is a direct relationship between growth and energy demand	6	75
There is no direct relationship between growth and energy demand	2	25

INDUSTRIES

Description	N=7	Percentage %
There is a direct relationship between growth and energy demand	5	71
There is no direct relationship between growth and energy demand	2	29

On average, 70% of respondents irrespective of their stakeholder groups agreed that there is indeed a direct relationship between growth and energy demand. However there were still respondents (representing a percentage of 20% in each group) from the Consultants & Experts, Power Producers and Industries who thought that there is no direct relationship between energy and growth.

2. What are the difficulties and weaknesses being faced by the energy sector in Mauritius?

REGULATORY BODIES

Description	N=3	Percentage %
Our country depends too much on petroleum products	2	67
There is little investment in the sector from the private sector	2	67

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Our country depends too much on petroleum products	5	100
The energy sector is not liberalised and monitored by only one body, that is, the CEB	4	80
There is little investment in the Energy sector	3	60
There is no proper policy established in the energy sector	3	60
The CEB uses obsolete equipment	3	60

POWER PRODUCERS

Description	N=8	Percentage %
The energy sector is not liberalised and monitored by only one body, that is, the CEB	7	88
Our country depends too much on petroleum products	5	63
There is little investment in the sector from the government	5	63
There is no proper policy established in the energy sector	5	63
Lack of competence	3	38
The CEB makes use of obsolete equipment which makes use of excessive amount of fuel	1	13
There are no appropriate resources to test new technologies.	1	13

INDUSTRIES

Description	N=7	Percentage %
Our country depends too much on petroleum products	5	71
There is no proper policy established in the energy sector	4	57
There is little investment in the sector	3	43
Lack of competence	1	14

Firstly, it is clear that the most common weakness of the energy sector in Mauritius, as pointed out by more than 60% of all the respondents, is due to a high dependency on petroleum products.

Secondly, more than 80% of the respondents from the Consultants & Experts and Power Producers pointed out that the problem is due to the CEB being the sole entity, responsible of the energy sector.

Thirdly, a high percentage of respondents (60%) from the different groups, except from Regulatory bodies, said that there is not a defined and clear policy established for the energy sector in Mauritius. Fourthly, the problem faced by the energy sector, as stated by approximately 60% of all the respondents, is that there is not enough investment in this field.

Further possible weaknesses were raised by respondents in the Consultants & Experts group; 13% of the respondents said that the CEB is inefficient as it is making use of obsolete equipment, which uses excessive amount of fuel. Also 13% of respondents from the same group mentioned that no appropriate resources are being used to test technologies.

3. What could be considered as the future challenges of the energy sector?

REGULATORY BODIES

Description	**N=3**	**Percentage %**
Develop the use of renewable sources of energy	3	100
Reduce dependency on petroleum products	2	67
Develop of the human resources	2	67

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Develop the use of renewable sources of energy	5	100
Reduce dependency on petroleum products	3	60
Use efficient equipments in industries	3	60

POWER PRODUCERS

Description	N=8	Percentage %
Develop the use of renewable sources of energy	7	88
Reduce dependency on petroleum products	5	63
Increase efficiency of operations in industries	4	50

INDUSTRIES

Description	N=7	Percentage %
Develop the use of renewable sources of energy	6	86
Reduce dependency on petroleum products	5	71
Increase efficiency of operations in industries	5	71

The majority of respondents (average 94 %) from all stakeholder groups said that the challenge for energy sector is to develop the use of renewable sources of energy.

A further challenge according to approximately 60% of all respondents is to reduce dependency of coal and oil. Furthermore 71 % of respondents from Industries and 50% of respondents from Power Producers think that a good defy in the energy sector lies in increasing efficiency of operations in Industries. Also, 3 out of 5 respondents (60%) from Consultants and Experts mentioned that industries should use more efficient equipment. As analysed in question 2, this represents a weakness of the energy sector.

Finally, 67% of respondents from Regulatory bodies thought that the development of relevant skills in our human resources could be a good start in tackling the energy issue in Mauritius.

4. How would you tackle the problem of dependency on oil/coal for Mauritius?

REGULATORY BODIES

Description	N=3	Percentage %
Develop the use of renewable sources of energy	3	100
Promote the use of bagasse for producing electricity	3	100
Upgrade existing hydropower plants	1	33

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Develop the use of renewable sources of energy	5	100
Promote the use of bagasse for producing electricity	3	60
Promote cogeneration schemes	1	20

POWER PRODUCERS

Description	N=8	Percentage %
Develop the use of renewable sources of energy	7	88
Establish a policy where bagasse could be purchased from sugarcane factories for the production of electricity	7	88
Promote cogeneration schemes	1	13

INDUSTRIES

Description	N=7	Percentage %
Use solar energy for providing hot water and for pool heating	6	86
Promote the use of bagasse for producing electricity	4	57
Use tidal energy for producing electricity for factories near the coast	2	29
Promote cogeneration schemes	3	43
Grow plants that can eventually be turned into charcoal for fuel use	1	14

The majority of respondents (more than 80%) from all the stakeholder groups mentioned that problem of oil/coal dependency could be resolved by developing renewable sources of energy. 6 out of 7 respondents (86%) in Industries proposed the use of solar energy as a type of renewable energy.

Furthermore, respondents from the Regulatory Bodies (100%), Consultants and Experts (60%) Power Producers (88%) and Industries (57%) proposed the use of bagasse for the production of electricity. An interesting proportion (43%) of respondents from Industries raised the issue of promoting cogeneration schemes.

1 out of 3 respondents (33%) in the Regulatory Bodies proposed to upgrade existing hydropower plants to counteract the problem of dependency on oil/coal. Two new ideas have popped up from respondents in Industries; 29 % of the people proposed using tidal energy for production of electricity while 14% mentioned that wood/biomass could be converted to charcoal for fuel use.

5. **To what extent does cheap reliable energy attract FDI?**

REGULATORY BODIES

Description	N=3	Percentage %
Cheap reliable energy highly contributes to attracting FDI	2	66
Cheap reliable energy does not necessarily attract FDI	1	33

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Cheap reliable energy highly contributes to attracting FDI	4	80
Cheap reliable energy does not necessarily attract FDI	1	20

POWER PRODUCERS

Description	N=8	Percentage %
Cheap reliable energy highly contributes to attracting FDI	6	75
Cheap reliable energy does not necessarily attract FDI	2	25

INDUSTRIES

Description	N=7	Percentage %
Cheap reliable energy highly contributes to attracting FDI	5	71
Cheap reliable energy does not necessarily attract FDI	2	29

Almost all respondents representing a percentage of more than 70% from all the stakeholder groups agreed that cheap reliable energy highly contribute to attracting foreign investment in Mauritius. However, in every stakeholder group, a slight proportion (approximately 25%) of respondents thought that cheap reliable energy does not necessarily attract FDI.

6. What would you consider to be opportunities for Mauritius in the energy sector?

REGULATORY BODIES

Description	N=3	Percentage %
Increase the production of bagasse for producing electricity	2	67
Develop means of energy recovery in industries	1	33

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Increase the production of bagasse for producing electricity	4	80
Develop means of energy recovery in industries	3	60
Develop the new technologies already existing	2	40
Incinerate waste for generating electricity	2	40

POWER PRODUCERS

Description	N=8	Percentage %
Increase the production of bagasse for producing electricity	7	88
Increase efficiency of equipment used	4	50

INDUSTRIES

Description	N=7	Percentage %
Increase the production of bagasse for producing electricity	5	71
Develop means of energy recovery in industries	4	57
Incinerate waste for generating electricity	3	43

The majority of respondents in all stakeholder groups (practically more than 70%) agreed that the use of bagasse for the production of electricity could be a major opportunity for Mauritius.

Moreover, two groups namely Consultants & Experts and Industries mentioned two possible alternatives; by developing means of energy recovery in industries (approximately 60%) and by the incineration of waste products (around 40%). However 50% of the Power Producers respondents pointed that there should be an increased efficiency in the equipment used.

Furthermore, 2 out of 5 respondents (40%) from Consultants and Experts stated that existing technologies should be developed for the energy sector in Mauritius.

7. Where should efforts be focussed to solve the energy problem?

REGULATORY BODIES

Description	N=3	Percentage %
Develop the utilisation of renewable sources of energy	3	100
Devise strategies to save energy	2	67

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Develop the utilisation of renewable sources of energy	4	80
Devise strategies to save energy	3	60
Encourage the use of energy-efficient equipment	1	20
Give facilities to public to produce electricity and sell excess to the national grid	1	20

POWER PRODUCERS

Description	N=8	Percentage %
Develop the utilisation of renewable sources of energy	8	100
Devise strategies to save energy	7	88
Encourage the use of energy efficient equipment	5	63

INDUSTRIES

Description	N=7	Percentage %
Develop the utilisation of renewable sources of energy	7	100
Devise strategies to save energy	5	71
Encourage the use of energy efficient equipment	4	57

The majority of respondents (nearly 100 %) in all stakeholder groups thought that the development of renewable sources of energy should be an effort to solve the energy issue. Furthermore, a high proportion of respondents (average of 72%) in all groups pointed out that there should be clear strategies set up to help in saving energy. Also, a significant proportion of respondents among Power Producers (63%) and Industries (57%) mentioned that energy-efficient equipment could help solve this issue in the energy sector.

Finally, 1 out of 5 respondents (20%) in the Consultants & Experts group proposed giving facilities to the public to produce their own electricity and selling the excess to the national grid.

8. **What can Mauritius develop to reduce the energy demand growth whilst maintaining GDP growth?**

REGULATORY BODIES

Description	N=3	Percentage %
Encourage travelling in common transport	3	100
There should be a night and day tariff	2	67

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Encourage travelling in common transport	4	80
There should be a night and day tariff	3	60
Establish carbon credit	2	40
Government should promote sales of solar energy products by removing taxes and granting facilities	2	40

POWER PRODUCERS

Description	N=8	Percentage %
There should be a night and day tariff	5	63
Establish of carbon credit	4	50

INDUSTRIES

Description	N=7	Percentage %
Encourage travelling in common transport	6	86
There should be a night and day tariff	5	71
People should be encouraged to carry out activities that consume much electricity, outside peak hours.	4	57
Industrial zones should be located next to production sites so that vapour and electricity can be obtained at cheaper prices.	2	29

Firstly, on average, 65% of respondents in all stakeholders groups think that having a night and day tariff could help maintain GDP growth while reducing energy demand.

Secondly, respondents of the Regulatory bodies (100%), Consultants & Experts (80%) and Industries (86%) think that travelling in common transport should be encouraged.

Thirdly, on average, 45% of respondents of Consultant & Experts and Power Producers agree that there should be an establishment of carbon credit. Third, 4 out of 7 (57%) respondents in Industries agree on the fact that people should be encouraged to carry out, outside peak hours, activities that consume much electricity.

Fourthly, 2 out of 5 respondents (40%) of Consultants & Experts feel that the government should remove taxes on solar energy products to promote the sales of these products.

Finally, 2 out of 7 respondents (29%) from Industries think that a solution could be to locate industrial zones next to production sites so that vapour and electricity can be obtained at cheaper prices.

9. How can other sources of energy contribute to the energy sector?

REGULATORY BODIES

Description	N=3	Percentage %
Use of renewable sources of energy for e.g. solar energy can help the public to save on electricity	3	100
Use of bagasse for production of electricity can help reduce dependency on petroleum products and hence reduce import costs on fuels.	2	67

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Use of renewable sources of energy for e.g. solar energy can help the public to save on electricity	4	80
Use of bagasse for production of electricity can help reduce dependency on petroleum products and hence reduce import costs on fuels.	3	60

POWER PRODUCERS

Description	N=8	Percentage %
Use of renewable sources of energy for e.g. solar energy can help the public to save on electricity	7	88
Use of bagasse for production of electricity can help reduce dependency on petroleum products and hence reduce import costs on fuels.	6	75

INDUSTRIES

Description	N=7	Percentage %
Use of renewable sources of energy for e.g. solar energy can help the public to save on electricity	6	86
Use of bagasse for production of electricity can help reduce dependency on petroleum products and hence reduce import costs on fuels.	5	71

10. **What are the energy strategic options that should be considered for the future?**

REGULATORY BODIES

Description	N=3	Percentage %
Sensitise people to saving energy	3	100
Privatise the energy sector	2	66

CONSULTANTS AND EXPERTS

Description	N=5	Percentage %
Sensitise people to saving energy	4	80
Privatise of the energy sector	3	60
Develop the production of ethanol for use as fuel	2	40

POWER PRODUCERS

Description	N=8	Percentage %
Sensitise people to saving energy	7	88
Privatise of the energy sector	7	88
Establish an equilibrium between CEB and IPP	5	63
Develop the production of ethanol for use as fuel	2	25

INDUSTRIES

Description	N=7	Percentage %
Sensitise people in saving energy	6	86
Privatisation of the energy sector	6	86

On average, 88% of the respondents in all stakeholder groups mentioned that there is a need to sensitise people in saving energy. Furthermore, there is a high percentage (average of 75%) of all respondents who thought that privatisation of the energy section could be a strategic option to consider in the future. 63% of the respondents in the

Power Producers group thought that there is a need to establish equilibrium between CEB and IPP. Finally, 40 % of respondents from Experts and Consultants and 25% of the respondents from the Power Producers group suggested the production of ethanol for fuel use.

5 DISCUSSION

Chapter 5 seeks to discuss the results of the in-depth and semi-structured interviews conducted with the respondents. The research findings from chapter 4 will be analyzed and reference will be made to the literature review. The objective of this chapter is to discuss whether the propositions made are supported fully or partially or not supported at all by research. This section will also include quotes from the different transcripts to enable better understanding and also to provide additional insights.

5.1 Proposition 1: Energy is strongly related to Economic growth

The question that will answer Proposition 1 is stated below with reference to question 1 as per the findings obtained in chapter 4.

- What are your perceptions about the relationship between growth and energy demand?

The majority of respondents (70%) from the four different stakeholder groups stated that there is a direct relationship between Economic growth and Energy demand. Some of the main reasons given by them were that;

1) Increase in GDP is often the result of increased production in industries meaning use of more machines and thus of fuel

2) Increase in GDP implies that the purchasing power of people increases and therefore people will more likely increase their comfort through purchase of air-conditioning, cars and these are products which consume energy.

3) Energy demand is dependent on a country's stage of development. For instance, when the infrastructure is developed with new buildings and with new street lightings, eventually, demand in electricity rises. With a country's development, power needs to be supplied in regions which were in the past known to be remote areas

One of the respondents used statistics to prove that "demand is expected to increase from 1700GWH in 2002 to 2436 GWH in 2010 and this represents a cumulative growth of 4.8 %"

However, there were 20% of the respondents who pointed out that there is no direct relationship between Energy demand and growth. A respondent mentioned that:

"Economic growth is not automatically linked to Energy demand since the latter is dependent on the type of industry we are in. It has been observed that energy peaks at CEB occur between 18h-21h meaning that textile or manufacturing industries cannot be accountable for this. Hotels and Domestic use are responsible for this state of things."

However the other respondents said that since Mauritius is not a developed or a fast developing country, Economic growth cannot be directly related to demand in Energy.

Nevertheless, research has shown that the tendency is towards a close relationship between energy demand and economic growth. Also figure 2 in the literature review clearly shows that GDP and Energy demand have increased consistently from 1999 to 2003.

5.1.1 Conclusion

In the light of the above discussion, we can say that Proposition 1 is supported by research and that indeed Energy is strongly related to Economic Growth.

5.2 Proposition 2: Mauritius has to identify and focus on the external factors that influence its energy policy.

The questions that will answer proposition 2 are stated below as per the findings obtained in chapter 4.

- What are the difficulties and weaknesses faced by the energy sector in Mauritius?
- What could be considered as the future challenges of the energy sector?

From the interviews conducted with the respondents, the main weaknesses and difficulties faced by the Energy sector in Mauritius are discussed below.

1) Firstly, according to more than 60% of all respondents, there is a high dependency on petroleum products in Mauritius. Indeed at least 63% from each group mentioned that our country depends too much on petroleum products. In fact, the price of HFO is high and is subject to a continual increase not only in Mauritius but across the world.

One respondent from the Regulatory bodies stated that Mauritius is like a hostage to the fluctuations in the world petrol price and as long as we depend on petroleum products as main fuel, we will be bound to go on investing tremendous amount of money in the energy sector.

One respondent from the Power producers said that the great difficulty is to produce and supply electricity at lower costs due to the high price of petroleum products.

Another respondent from the Experts group mentioned that:

> "High price of petroleum products is beyond our control. However government and private companies should investigate on new ways to produce electricity from sources which will be most cost effective."

2) Secondly, more than 80% of respondents from the Consultants and Experts and more than 60% of respondents from Power Producers think that another weakness is due to the fact that the CEB is the only monitoring body in the Energy sector of Mauritius. The quotes below demonstrate the opinion of some respondents on the monopoly held by the CEB regarding the Energy Sector.

As one Consultant said, "There is a need to liberalise the Energy Sector and especially there need to be other players than CEB. The CEB should not at the same time produce, supply and sell electricity because alone it cannot develop the energy sector in Mauritius. Also the CEB alone cannot explore all possibilities that could lead to a progress in that sector."

A respondent from the Power and Producers group said that:

"The CEB is the only entity to produce, distribute and commercialise electricity. There is a need to separate these three functions and to have a regulator between these sectors. This will lead to more transparency in costs."

A consultant added that "since the CEB has monopoly, it is at the same time Judge and Party."

Another comment from a Consultant was:

"Monopoly of the CEB results in distribution of Energy which is more expensive."

3) Thirdly, another problem which was mentioned by 60% of respondents in all stakeholder groups with the exception of Regulatory Bodies was that there is not a clear and defined strategy for the energy sector in Mauritius. It was thought that the different governments took too much time before making decisions. One respondent from the Experts group pointed out that very often, round tables and discussions among different stakeholders and the government are set up but eventually do not lead to concrete actions.

As stated by a respondent from Industries, "there is a lack of synergy in the energy sector and lack of good policy decisions which are factors affecting the Energy sector in Mauritius."

4) Furthermore, 60% of respondents in all stakeholder groups stated that the problem in the Energy Sector can be associated with a lack of investment. As per the transcripts, respondents from private sectors held that Government does not provide enough facilities to solve issues in the Energy sector and respondents from Regulatory Bodies said that the private sector is not investing enough. One respondent from the Experts group stated that unless the government decides to invest in the energy sector, it will not progress. On the other hand, one member from the Regulatory bodies said:

"The government alone cannot improve our energy sector. It needs other expertise and Financing for bringing considerable changes in that sector."

Question 3 in chapter 4 relates to perceptions of respondents with regards to the challenges in the Energy Sector. Answers obtained were assumed by the researcher to be action plans that need to be taken to face or to reduce the influence of external factors discussed in question 2. The answers obtained are discussed below:

1) An average of 94% of respondents in all stakeholder groups agreed that the challenge in the energy sector lies in the development of renewable resources. Most of them said that we cannot go on depending on petroleum products. Some other sources of energy which have been proposed are bagasse, wind, tidal and solar energy. One respondent from the Experts group mentioned that facilities and expertise should be made available in Mauritius so as to encourage development and use of renewable sources of energy. Another person from the same group said that it could be interesting if people living in windy regions could install mini wind turbines in their yards to produce their own electricity.

Someone from the Industries group said that the possibilities of exploiting tidal energy in the lagoons in the south of Mauritius should be investigated.

Many respondents from the different groups mentioned that solar water heaters should be made a common and basic commodity for Mauritian households.

2) Respondents from Industries (71%) and Power Producers (50%) think that industries in Mauritius should increase their efficiency. Industries should try to use machines and equipment that do not consume excessive fuel. They should resort to more efficient and effective machines. Some respondents said that one great problem is that many factories have old machines, that might be very expensive to replace but which lead to greater energy input.

One industrialist said that one big challenge is to try for example to use water/oil atomising burners, which reduce the use of heavy fuel oil and at the same time result in clean emissions.

3) 67% of respondents from Regulatory Bodies think that government should focus on the development of skills and knowledge in our people so that in turn these people can bring in innovating solutions to problems in the energy sector.

As stated by past research, Mauritius forming part of SIDS, is confronted with many difficulties as far as the Energy Sector is concerned. Some of the main external factors as supported by current research are high prices of HFO, lack of strategy in policy decisions concerning energy, poor foreign direct investment, lack of investment from government and lack of appropriate competence to solve problems occurring in this sector.

In question 3, interviews identified the major challenges that Mauritius has to focus on to reduce the crisis in the Energy sector. Answers were oriented towards the production of electricity from renewable sources, the need to increase the overall efficiency in Industries and the need to develop the appropriate competence.

5.2.1 Conclusion

It can thus be concluded from research carried out on these two questions that Proposition 2 holds true since there are external factors which affect the Energy sector in Mauritius and which require appropriate actions to avert any subsequent problem.

5.3 Proposition 3: The Energy sector in Mauritius is too much dependent on imported fuel.

The question that will answer proposition 3 is stated below as per the findings obtained in chapter 4.

- How would you tackle the problem of dependency on oil/coal for Mauritius?

When this question was raised during the survey, it was observed that all respondents agreed that we depend too much on imported such as HFO and coal. The respondents of the survey proposed alternative sources of fuel apart from HFO, which could be used to reduce dependency on traditional fuels. These were:

1) 86% of respondents from the Industries group thought of solar energy as a type of renewable energy. A hotel Manager stated that solar systems could be set up in hotels for heating water. He mentioned that this might be quite of an investment but the payback period could be short if appropriate and efficient systems are proposed.

2) A high proportion of respondents from the different stakeholder groups stated that the use of bagasse should be promoted as an alternative fuel for the production of electricity.

3) 29% of respondents from Industries mentioned the use of tidal energy. These proposed the idea of erecting special electricity generating plants in the sea found in the south of the country.

4) 14% of respondents from Industries proposed that wood/biomass could be burnt to produce charcoal, and this could eventually be used as an alternative for fuel.

However this opinion was criticised by an interviewee from the Expert group who claimed that, “obtaining energy from plants is not a solution as there is not enough space in Mauritius to implement such a practice. Also, we cannot afford the risk of causing soil erosion by deforesting our landscape.”

Apart from the need to develop renewable sources of energy, new ideas were proposed to reduce oil and coal dependency.

1) According to respondents from Industries (43%) and Consultants and Experts (20%), cogeneration schemes could be proposed. These people agreed to the fact that it could be very interesting to use live steam from boilers for producing electricity while using the exhaust steam from turbines for process heating. One person from the Industries group mentioned the possibility of making use of hot water from chiller units for heating sanitary water in hotels.

Also, one respondent from the Consultant and Expert group stated that:

“Decentralisation and co-generation will surely ensure overall efficiency of energy. Legislation should be enforced on decentralised power and co-generation.”

2) 33% of respondents from Regulatory bodies proposed to upgrade existing hydropower plants. According to them, since Mauritius has a tropical climate and we get sufficient rainfall during certain periods of the year, hydropower is a great potential for our country.

According to past research, it was seen that the high price of petroleum products is associated with fluctuation and uncertainty of fuel across the world. In this 21st century, we can say that our demand for energy has increased since we have shifted from an agriculture-based economy to one oriented towards tourism, offshore services and ICT.

As such, Mauritius is spending a lot on the purchase of imported fuel; this is definitely affecting its balance of payment. This results in a situation where the cost of services and commodities (such as transport) relying on the price of energy is becoming unaffordable. Therefore it is judicious to say that, on one side, the imported fuel should be used in an efficient manner and on the other side that there should be development and enhancement of locally available resources. There should also be improvement in the manufacturing sector through the adoption of co-generation- concurrently providing thermal heat for process and electrical energy for driving motors and lighting. According to statistical figures, the current efficiency of utilisation of heavy oil in the generation of electricity is around 40% and its potential is 75%. Use of coal, diesel oil and kerosene are also characterised by low efficiency in the Mauritian Industries and appropriate measures are needed for the improvement of efficiency.

5.3.1 Conclusion

In the light of current research and research undertaken in the past, it can be said that Proposition 3 holds true since relevant information has been obtained from respondents which proves that Mauritius is too dependent on oil/coal.

5.4 Proposition 4: The situation in the Energy sector in Mauritius will result in a shift to a service-based economy.

The questions that will answer proposition 4 are stated below as per the findings obtained in chapter 4.

- To what extent does cheap reliable energy attract FDI?

- What would you consider to be opportunities for Mauritius in the Energy sector?

Question 5 seeks to obtain the perception of people on the relationship between Foreign Direct Investment and cheap and reliable energy.

The majority of respondents from the four stakeholder groups, representing a percentage of 70%, agreed that indeed cheap and reliable energy attracts foreign investors in Mauritius.

A respondent from Power Producers said that reliable energy is in fact more important than the price of fuel. He added that “Power Producers and distributors are all looking for reliable sources of energy.”

This opinion is upheld by another respondent from the Power and Producers group, “we are more interested in producing reliable energy as our objective is to ensure customer satisfaction.”

A respondent from the Expert and Consultant group stated that:

“Cheap reliable Energy will definitely attract foreign investors in our country as this will directly impact on their production cost. With the fact that Mauritius has a good geographical position and provided reliable and cheap energy can be obtained, this will obviously make Mauritius more competitive. Hence these factors will surely attract FDI.”

One respondent from the Regulatory Bodies said that “cheap reliable energy attracts FDI for specific industries such as the Aluminium industries.”

Even if the majority of respondent think that reliable and cheap energy attracts FDI in Mauritius, there are still 25% of respondents who do not agree to this statement.

As mentioned by a respondent from the Experts and Consultant group,” reliable and cheap energy can be an issue, but the main problem of foreign investment is lack of skilled workers.”

However, for this particular question we can deduct that the majority of respondents think that reliable and cheap energy is most likely to attract foreign investment in Mauritius.

Question 6 relates to the opinion of respondents on the opportunities for Mauritius in the energy sector.

First, more than 70 % of all the respondents have agreed that bagasse could be used as an alternative fuel in the production of electricity.

One respondent from Power Producers said that:

“A new strategy could be encouraged whereby bagasse could be purchased from Sugarcane Industries at a cheaper price and subsequently processed to produce electricity.”

Another opportunity pointed out by 60% of respondents from Industries and Consultant can be recovery of energy in Industries. As stated by some respondents, the advantages of energy recovery could be:

(a) To reduce imports of oil and coal,
(b) To increase efficiency in industries which will subsequently help them to be more competitive on the market
(c) To ensure conformity to measures stated in the KYOTO Protocol.

A very interesting prospect mentioned by 40% of respondents from the same stakeholder group is the incineration of waste products. One respondent mentioned that this “is an intelligent way of producing energy but this should be done by respecting environmental issues.” He added that this could have positive impact such as less pressure on environment, less pollution and a clean environment for tourists.

However, this opinion was criticised by some respondents and one clearly stated that:

“Incineration of waste is too expensive for Mauritius as even European countries are facing problems with POPs. For incineration to be possible in Mauritius, there needs to be political willingness.”

According to literature review, it appears that for Mauritius to attract FDI, it has to move out from an industrial sector and focussed more on a service-based economy. As

explained, this is mainly due to the high price of fuel. However, if Mauritius wants to attract FDI in the manufacturing sector, price of fuel should be affordable. Since price of HFO is beyond control and subject to international policies, it means that we will have to look for alternative ways of producing reliable and cheap energy.

Findings related to Question 5 showed that cheap reliable energy attracts FDI and respondents identified feasible ways of obtaining energy from alternative sources. We can thus conclude that if we succeed in developing cheaper and reliable energy, foreign investment will increase in the industrial sector.

5.4.1 Conclusion

In the light of evidence provided above, it can be deduced that current research does not fully support Proposition 4. Indeed if we continue to depend solely on coal/oil, then price of fuel will be too expensive. Analysis of findings has showed that there are possible ways of producing energy from alternative sources and so implying that this would attract FDI. Hence our economy will not have to compulsorily shift completely to a services economy to survive. In fact, this will depend heavily on the policies which will be established by government in the Energy Sector. If the policies are in favour of developing alternative sources for the production of energy then the industrial sector has an opportunity to succeed.

5.5 Proposition 5: Solving Energy problems always starts from the consumption and efficiency side.

The question that will answer proposition 5 is stated below as per the findings obtained in chapter 4.

- Where should efforts, be focussed to solve the energy issue?

1) Firstly, practically 100% of the respondents irrespective of their stakeholder groups agreed to the fact that the development of renewable sources of energy could be a factor which could save the energy sector.

Many respondents mentioned the use of solar energy as a type of renewable energy. One of the respondent, said that:

“Energy from the sun is a great potential for a tropical island like Mauritius. Hence people should be encouraged and empowered to optimise the use of solar energy.”

A consultant in the Energy sector has proposed waste management technique as an example since waste contains more than 90% organic matter. According to that person, wastes combined together in pellet forms may have high calorific values and hence be a potential fuel.

2) Secondly, a high proportion of respondents (72%) from all groups stated that there should be clear strategies on the ways to save energy.

3) Thirdly, respondents from Power Producers (63%) and Industries (57%) thought that industries should be equipped with energy efficient equipment and also ensure that

operations occur efficiently that is, maximisation of output while minimising input. However, a respondent from the Industries group said that “prices of electrical and technological equipments, which are energy saving should not be of higher prices.” Here he gave the example of flat screen being more expensive that traditional screen.

4) Fourthly, 20% of respondents in the Consultant and Expert group mentioned that government should provide facilities to the public to produce their own electricity and sell the excess to the grid.

5.5.1 Conclusion

From the answers to this question by the various stakeholder groups, it is found that indeed, solving energy problems starts from the consumption and from the efficiency side. Many respondents said that we should shift from non-renewable fuels to renewable ones and that we should make use of efficient equipment.

5.6 Proposition 6: Renewable Energy resources (RET) represent an opportunity for Mauritius.

The question that will answer proposition 6 is stated below as per the findings obtained in chapter 4.

- How can other sources of energy contribute in the energy sector?

One of the findings that arose while asking this question was that none of the respondents disagreed to the fact that other sources of energy could contribute in the energy sector. The majority of people interviewed thought that solar energy could be a very good possibility of helping people to save money.

Secondly, most respondents mentioned bagasse as an alternative to petroleum products, hence reducing our country's import costs on fuels.

5.6.1 Conclusion

While analysing the responses of the different people interviewed, it is found that renewable Energy resources, in fact, do represent an opportunity for Mauritius.

5.7 Proposition 7: Options should all be focused on achieving an energy/growth decoupling.

The questions that will answer proposition 7 are stated below as per the findings obtained in chapter 4.

- What can Mauritius develop to reduce the Energy demand growth while maintaining GDP growth?
- What are the energy strategic options that should be considered for the future?

Question 8 relates to the strategies that could be developed to reduce energy demand growth while maintaining GDP growth.

1) 65% of respondents in all stakeholder groups proposed night and day tariff to enable energy/growth decoupling. Some respondents expressed their doubts with respect to this strategic option. They thought that night and day tariff could be significant only for industries. For domestic applications, it is more difficult to adopt such strategy.

2) A high proportion of all respondents thought that travelling in common transport could be a measure to achieve this decoupling. One respondent from the Expert and Consultant group explained that:

   "There will be decreased consumption of diesel and gasoline. As such our balance of payments will improve due to decreased imports of petroleum products. Also this strategy will enable a decrease in carbon dioxide emission due less traffic jam."

   Another respondent from Industries said that:

“Common transport measures should be used as an aerial subway. The Highway between the two lanes of the motorway should be cancelled and used as bus lane, hence encouraging people to travel in common transport.”

On this same issue, one respondent from the Regulatory Bodies said that government should establish a policy where there will be a fee charge for entering in Port-Louis since a great number of vehicles normally travel in that direction and this could be a reason for discouraging people from travelling in their vehicles. According to him, this can be an initiative to solve the energy problem in the transport sector.

A respondent from the Consultant and Expert group hit upon the novel idea of transport localisation. According to him, “this will save cost and also reduce traffic. It is noted that fuel cost represents 1% of GDP.”

A consultant in the Energy sector mentioned the possibility of using alternative fuels derived from sugar-cane by-products for transportation. He stated examples of bio-diesel and ethanol.

3) 45% of respondents from Consultants & Experts and from Power Producers talked of an establishment of carbon credit. As stated by one respondent from Industries,

“One of the easiest ways to decrease energy demand growth is through energy efficiency. The carbon credit scheme is one of the ways through which energy efficiency investments can be financed.”

4) Respondents from Industries (57%) have suggested that industries should be encouraged to carry out their activities outside peak hours. One respondent from Consultant and Expert stated that:

5) “There should be policies which would encourage consumers to shift their demand outside the peak period, hence reducing the load on power stations. There should be introduction of time-differentiated rate and rate structure that would be applicable for residential purpose as well as small scale industries.

Question 10 relates to the perceptions of employees on the strategic options that should be considered as a future action for Mauritius.

Information obtained from the respondents is as follows:

88% of all respondents, irrespective of the stakeholder groups, think that a good initiative would be to sensitise the population to the need of saving Energy.

A respondent from the Regulatory Sector said that:

“Government should create awareness on the energy efficiency policies. This promotion campaign should become a challenge for the Ministry of Education to sensitise the general population.”

A respondent from the Industries mentioned that government should grant facilities (in terms of financial support) to experts in the Energy sector or to University students to conduct pilot projects which could be more energy efficient.

Another initiative that could be taken by government, as mentioned by two respondents from the Industries group, is to promote the sale of Solar Water Heater by reducing

taxes. Usually solar water heaters are products targeted only for a special market due to their relatively high price. With the removal of taxes, this product could become accessible to the general population and this could be a way of saving energy.

On average, 75% of the respondents think that privatisation of the Energy sector could be a solution in the Energy sector.

Regarding this issue, a respondent from the Consultant and Expert group mentioned the privatisation of utilities sector.

Another respondent from the Power Producers group explained the fact that we need privatisation in Mauritius.

“The Energy sector is too much in the hands of government. Things are not evolving. This is why the private sector is not investing and consequently there is no improvement in the sector.”

Furthermore, 63% of respondents from Power Producers group mentioned that there is a need to establish equilibrium between CEB and IPP.

The use of ethanol was proposed as an alternative by 40% of respondents from Expert and Consultants and by 25% from Power Producers.

On this issue a Consultant in the Energy sector explained the following:

“With the removal of trade barriers, Mauritius has no other choice than to focus on the production of ethanol. Thus cultivation of the Sugarcane should be divided into (1) the production of Sugar and (2) the production of mixed juice – ethanol. The economy can

only benefit if this scheme is implemented. Upon centralisation, the five sugar factories should make use of a distillery plant."

As per the current research, it can be concluded that energy/growth decoupling can be achieved by finding alternative ways of producing energy and electricity, by educating the population, by reducing carbon dioxide emission, by more energy efficient operations and also by policies that would be established by the government. If reference is made to literature review, it can be seen almost the same strategic options were proposed to help achieve this decoupling effect.

5.7.1 Conclusion

In the light of the above evidence, we can say that current research supports Proposition 7 as the strategic options proposed by the respondents are oriented towards achieving at reducing energy demand while maintaining growth.

6 CONCLUSION

Following research and analysis of the different interviews, the following propositions have been supported:

- Energy is strongly related to Economic growth.
- Mauritius has to identify and focus on the external factors that influence its energy policy.
- The energy sector in Mauritius is too much dependent on imported fuel.
- Solving energy problems always starts from the consumption and efficiency side.
- Renewable Energy resources represent an opportunity for Mauritius.
- Options should all be focused on achieving an Energy/growth decoupling.

The research demonstrated no major differences in the opinions of the respondents neither within one group nor among the different stakeholder groups.

The study showed that Mauritius indeed has an Energy sector that is undergoing certain difficulties, our main weaknesses being the lack of concrete energy policy and too much dependence on petroleum products. The main solutions proposed were the development of the use of renewable sources of energy and the liberalisation of the Energy sector.

From the evidence obtained during this current research, it has become clear that the optimal use of energy is largely dependent upon a comprehensive energy policy backed by appropriate strategic initiatives. This policy would require basic information regarding resources, consumption patterns and pricing structure. Moreover, the policy should also help to predict demand and also different options to satisfy this demand.

The strategic initiatives should cover three main areas:

- Energy Planning.
- Environmental issues.
- Energy Conservation Measures.

Firstly, effective energy planning is based upon the availability of accurate data which is related to the consumption of energy in the different sectors as well as upon a reliable forecast of energy demand for the future. Moreover, the appropriateness and relative advantage of available energy sources should be carefully assessed and relevant technical and financial feasibility studies for different energy technologies should be carried out.

For instance, for the generation of electricity on a national scale, a comparative study of the different options should be undertaken. These include fuel oil, coal, hydro and bagasse; but other possibilities should also be considered especially for smaller units such as wind energy, solar energy and wave energy.

Secondly, as far as environmental issues are concerned, Mauritius will have to cut down on the import of fossil fuels and to promote the use of clean energy. Indeed the current interest in energy studies is now linked with ecological balance. It is essential that further research should be done on the Energy-Economy-Environment-Engineering (E4) by putting emphasis on the national context. However, government should also focus on the case of remote islands such as Rodrigues, Flat Island and Agalega. These islands could be used for the promotion of pilot projects on the use of wind and solar energy.

Thirdly, efforts should be focussed on conservation measures in the energy sector in Mauritius. For instance, proper auditing and close monitoring, and the use of more efficient devices could be interesting issues.

Moreover, the use of certain additives could be used in the transport sector in view of reducing fuel consumption.

The industrial sector in Mauritius consumes a large amount of energy and therefore the identification of proper energy conservation measures could bring about substantial economic benefit.

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APPENDIX A : CONSISTENCY MATRIX

- **Research Title: Policy Options for the Energy Sector in Mauritius**
- **Method used: Survey by Interview – Content Analysis**

Sub problem	Proposition	Literature Sources	Questions	Method of analysis
To identify the key issues relating to the energy sector in Mauritius	Energy is strongly related to economic growth Mauritius energy policy will have to identify and take care of external factors	BEDP (1991); Batliwala (2001); Goldemberg (1998); Ferguson (2000); Wolde-Rufael (2003); Jumbe (2004); Weiiser (2004); Wahkeun&Lee (2004); Shiu&Lam (2004); Weisser (2004); Jafar (1999); Lewandowski (1995);	What are your perceptions about the relations between growth and energy demand? What are the difficulties and weaknesses being faced by the energy sector in Mauritius? What could be considered as the future challenges of the energy sector?	Data entered into database. Perused for preliminary interpretations. Sorted into groups or themes and sub-themes. Try to find meaning. Synthesised findings related back to proposition and theory.
To determine how these key issues will affect the energy policy decisions in Mauritius	Mauritius energy sector is too much dependant on import fuel. The situation in the Energy sector in Mauritius will result in a shift to a service-based economy.	Vision 2020 (2000); CEB Strategic Plan (2003); Baguant (1992); Goldenberg (2001); Fundaci (1976); Krugmann (1983); Hoyle (1999); Kleinpeter (1995);	How would you tackle the problem of dependency on oil/coal for Mauritius? To what extent does cheap reliable energy attracts FDI? What would you consider to be opportunities for Mauritius in the energy sector?	Data entered into database. Perused for preliminary interpretations. Sorted into groups or themes and sub-themes. Try to find meaning. Synthesised findings related back to proposition and theory

Sub problem	Proposition	Literature Sources	Questions	Method of Analysis
To clarify the strategic options that would allow Mauritius to meet its challenges in the energy sector	Solving energy problems always start from the consumption and efficiency side Renewable energy resources (RET) represents an opportunity for Mauritius Options should all be focused towards achieving an energy/growth decoupling.	Xiaoping (1997); Harel (1989); Wiser & Pickle (1999); Baguant (1990); Baguant et al (1994); Weisser (2004); Geller et al (2004); Alexander (1985); Macedo (2001);	Where the efforts should be focussed to solve the energy problem? What can Mauritius develop to reduce the energy demand growth whilst maintaining GDP growth. How can other sources of energy contribute to the energy sector? What are the energy strategic options that should be considered for the future?	Data entered into database. Perused for preliminary interpretations. Sorted into groups or themes and sub-themes. Try to find meaning. Synthesised findings related back to proposition and theory

APPENDIX B: INVITATION LETTER

Dear Sir,

I am presently completing an MBA program at WITS Business School (South Africa) and I have chosen strategy and economy modules as specialisation. Being an energy engineer (Dipl Ingenieur and DEA – Marseille, France), I have chosen to undertake a study in the field of Energy Economics and Strategy, as I believe that this will definitely widen my exposure to the subject. The title of the research study is:

"Policy Options for the Energy sector in Mauritius."

Researchers have demonstrated that economic growth (GDP/Capita) has a direct causality on energy demand. The relevance of researching on the subject for Mauritius is that energy demand will become more and more a barrier to economic growth and it is therefore important to determine the policy options that would allow Mauritius to overcome this problem.

Personal interviews will be used to conduct the survey, as this will provide more in-depth insights for the context of the study. The sample frame will consist of experts and executives involved the energy sector as well as executives involved in key economic, manufacturing and services sectors in Mauritius. The sample size will be of 30 respondents, classified in the following groups: Institutions, Private Power Producers, Consultant, Sugar Sector, Industrial and Services Sector. Data collected from the interview will be analysed using the content analysis method and results will be used to formulate proposed policy options for the energy sector in Mauritius.

I would be grateful if you could give me your support in this research and would appreciate if you could confirm, by return mail, your acceptance to cooperate in this study.

I thank you for your cooperation and I look forward to receiving your confirmation.

Kind regards

Didier Philogène

APPENDIX B: INTERVIEW SCHEDULE

Name of Respondent :

Stakeholder Group :

Occupation :

1. What are your perceptions about the relations between growth and energy demand?
2. What are the difficulties and Weaknesses being faced by the energy sector in Mauritius?
3. What could be considered as the future challenges of the energy sector?
4. How would you tackle the problem of dependency on oil/coal for Mauritius?
5. To what extent does cheap reliable energy attract FDI?
6. What would you consider to be opportunities for Mauritius in the energy sector?
7. Where the efforts should be focussed to solve the energy problem?
8. What can Mauritius develop to reduce the energy demand growth whilst maintaining GDP growth?
9. How can other sources of energy contribute to the energy sector?
10. What are the energy strategic options that should be considered for the future?