**REVIEW OF ELECTRICITY POLICY PLANNING IN NAMIBA**[1]

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## 1. OPINION: THE CASE OF RENEWABLE ENERGY

### 1.1 Introduction

Namibia's White Paper on Energy Policy of 1998 is focussed on meeting seven energy goals; security of supply, social upliftment, effective governance, investment and growth, economic competitiveness, economic efficiency and sustainability. The same policy document states that the promotion of the use of renewable energy would be driven through the establishment of adequate institutional and planning framework, the development of human resources, public awareness and suitable financing systems. In an effort to meet these goals, a number of projects and programmes were initiated, implemented and facilitated by the Government and through partnerships with developmental organisations and the private sector. In 1993, the Ministry of Mines and Energy launched a programme for the "Promotion of the Use of Renewable Energy Sources in Namibia", which was supported by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. In 1996 the Government launched the first solar revolving fund under the Home Power Project with support from Renewable Energy for African Development (REFAD) a US-based development organization. Under this project, loans were granted to interested rural households for the purchase of photovoltaic solar home systems (SHS) in order to ensure the systems affordability for the entire nation and over 600 units were sold through the programme. This was a first step to address the financing barriers associated with renewable energy technologies. Subsequent programmes followed and these include the giant Namibia Renewable Energy Programme (NAMREP) supported by the Global Environment Facility (GEF) through the United Nations Development Programme (UNDP) and the Danish Government funded Renewable Energy and Energy Efficiency Capacity Building Programme (REEECAP). The Renewable Energy and Energy Efficiency Institute (REEEI) was established to

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facilitate and conduct research into and promote renewable energy (RE) and energy efficiency (EE).

All these and other developments have seen a big surge in both demand and installations of renewable energy technologies, especially solar home systems for solar electricity. Other technologies such as solar water pumping and solar water heating have equally benefited.

Despite all these efforts, the contribution of renewable energy to national energy mix is still negligible. Figure 1.1 illustrates that energy derived from renewable energy in 2006 in Namibia was very negligible in comparison to other resources such as petroleum and conventional electricity. In 2006, Namibia's electricity peak demand was 490MW against an available generation capacity of 360 MW while the installed solar electricity at that time was less than 500kW (0.5MW).

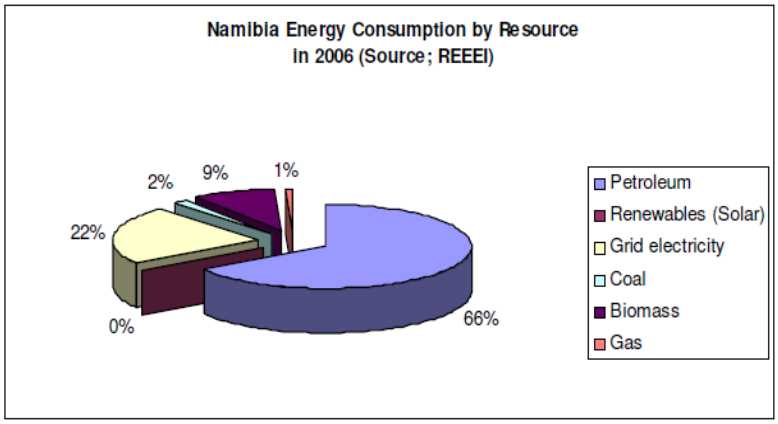


**Figure 1-1: Namibia Energy Consumption by Resource in 2006 (Source; REEEI)**

## 1.2 Role of National Institutions in Supporting Renewable Energy in Namibia

It is a Government held view that the gap in economic development and quality of life between rural and urban population in the country may be addressed through rural electrification. With the national electrification rate of 30% and rural electrification rate of less than 15%, rural electrification remains a nightmare although it is one of the priority issues of the national

Energy Policy of Namibia (*discussion with MME and NAMREP*). The infrastructure associated with rural electrification is very expensive, at least in the Namibian context, largely due to the low population density (approximately 2.4 people per square kilometre) and low economic activities in the areas requiring electricity to support the cost of bringing the grid to those areas. The Rural Electricity Distribution Master Plan developed in 2005 identified areas where grid electrification will remain unfeasible in the foreseeable future. The Off Grid Energisation Master Plan (OGEMP) launched in 2007 was designed to ensure that those areas where grid electrification is unfeasible will be appropriately developed through off-grid energy solutions based largely on solar energy technologies. Barriers to renewable energy in Namibia were identified as human technical capacity; policy and regulatory framework; awareness and social acceptance of the technology; financing and institutional support.

### 1.2.1 The Namibia Renewable Energy Programme (NAMREP)

The Namibia Renewable Energy Programme (NAMREP) is a US$ 14 million technical assistance project implemented by the Government with financial support from the Global Environment Facility and implementation support from the United Nations Development Programme (UNDP). It has been addressing some of the barriers experienced in the dissemination of renewable energy technologies in Namibia. The first phase of NAMREP (2004 - 2007) looked at matters of policy and regulations governing renewable energy, removal of financial and technological barriers and capacity building in Government, NGOs and the private sector. That phase also concentrated on raising public awareness of renewable energy technologies. The second phase (2007-2010) is aimed at speeding up the implementation of solar-energy activities that have impacts as identified in Phase I, stimulated by financing schemes for appropriate product delivery mechanisms. The activities of NAMREP may be attributed to contributing to the sudden surge in demand and subsequent deployment of renewable energy technologies in the country. Between 2004 and 2007 there was a 5 to 8 fold growth in renewable energy technologies as shown in Table 1.1.

**Table 1-1: Solar Technologies Installed/Year in Namibia (REEEI renewable energy survey-2008).**

| Technology | Year | | | |
|---|---|---|---|---|
| | **2004** | **2005** | **2006** | **2007** |
| Photovoltaic electricity (kW peak) | 16.8 | 94.7 | 94.4 | 138.7 |
| Solar water pumping (kW peak) | 36.7 | 25 | 95.9 | 180.2 |
| Solar Thermal (kW peak) | 356 | 641.6 | 2017.6 | 4312.8 |

Securing of finance for solar home systems has always been a huddle for those requiring the technology partly because financial institutions have always considered that end of the market as a risky area. Punitive interest rates have dissuaded beneficiaries from accessing loans to finance their systems. NAMREP entered into an arrangement with a financial institution to guarantee loans for solar technologies and the concerned institution has provided loans at discounted interest rates.

Through NAMREP, over 80 solar installers were trained across the whole country on the theory, design and installation of the solar technologies. Efforts were also made to provide business management skills to the installers. Current efforts are aimed at governing the renewable energy industry through the National Technical Committee on Renewable Energy (NTCRE) which is a renewable energy industry wide representative group. The mission of NTCRE is to ensure that an environment exists for the growth of the renewable energy industry in Namibia within a framework that protects consumers and the environment by promoting quality of renewable energy products and services. The Committee currently runs a registration scheme for renewable energy technologies installers and suppliers. After adopting appropriate standards, NTCRE aims to certify personnel and processes to ensure that renewable energy technologies end users receive quality products and services.

The activities and achievements of NAMREP need institutional support for sustainability beyond the end of NAMREP in 2010. It is envisaged the REEEI and the Renewable Energy Unit of the Ministry of Mines and Energy will assume that role.

### 1.2.2 The Solar Revolving Fund

The solar revolving fund arrangement is basically to provide loans at subsidized interest rates to end users of three technologies; solar home systems (SHS), solar water heating (SWH) and solar water pumping (PVP). The programme was launched in 1996 with support from REFAD. The Ministry of Mines and Energy has since been providing some money to a fund administrator to administer/manage the loan scheme. The scheme is presently overwhelmed and cannot meet the demand for the loans. The scheme is run on the **Ownership Model** where the end user purchases a solar system by making use of the revolving credit fund loan facility and thus becomes the owner of the system. In this model, the responsibility for the system and its maintenance rests with the owner.

### 1.2.3 The Off Grid Energisation Master Plan

The Off Grid Energisation Master Plan (OGEMP) was officially launched in 2007. The OGEMP will provide access to energy through an Energy Shop model. The plan is to establish energy shops within reasonable distances of the targeted communities. Private end users will access the technologies through an ownership model (described in 1.2.1) and government institutions will be energised through the current public infrastructure model. The energy shops would sell suitable, approved energy products and compatible appliances modelled as **energy baskets**. Emphasis would be placed on energy technologies and appliances that utilize renewable energy and energy efficiency. The energy shops would also serve as payment collection centres for the national off-grid energy financing mechanism, thus working hand in hand with the Solar Revolving Fund (SRF) administrator. It is envisaged that each region will have one energy shop in the first year of implementation. During the first two years of the OGEMP rollout plan, all the

13 regions would be focused on equally. The regions will have more shops based primarily on the size of un-electrified areas, but with more focus on rural areas.

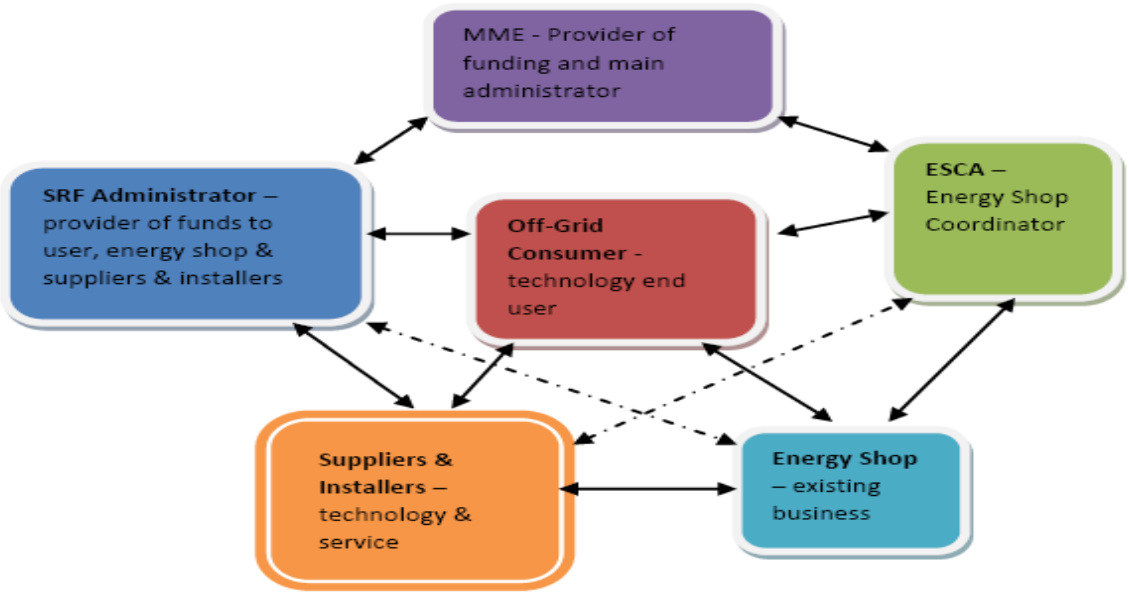


**Figure 1-2: Network and Operation of OGEMP under the Energy Shop Model**

The OGEMP "driver" or Energy Shop Coordinating Agent (ESCA) shall coordinate with regional councils on the establishment of the energy shops, recruit the shops, organize and oversee the technology awareness campaigns, among other activities.

### 1.2.4 The Renewable Energy and Energy Efficiency Institute

The Renewable Energy and Energy Efficiency Institute was established in 2006 through a cooperation agreement between the Ministry of Mines and Energy and the Polytechnic of Namibia. The cooperation agreement mandated the Institute to facilitate and conduct research into renewable energy and energy efficiency; develop materials and standards, report and disseminate information and materials on renewable energy and energy efficiency; and facilitate cooperation between the Ministry and the Polytechnic**,** as a public institution, primarily responsible for clean energy technologies as well as other stakeholders. The Institute

was the implementer of the Renewable Energy and Energy Efficiency Capacity Building Programme (REEECAP) (2006-2008) funded by the Royal Danish Government. The objective of REEECAP was *"To increase the capacity of the Namibian resource base in selected areas to enable it to contribute to the implementation of the national policies for renewable energy and energy efficiency as stated in the White Paper on Energy (1998) and the Second National Development Plan (NDP2, covering 2001-2005)".* REEECAP's strategic focus was on enhanced capacity for both rural and urban decision makers in energy planning. A total of 21 sub-projects varying from "energy efficiency strategic plan", "review of building codes", to "electricity supply and demand management options" were undertaken under REEECAP.

In order to meet its mandate, REEEI needs a lot of capacity building since the Institute is envisaged to play a pivotal role in the OGEMP, take over most of NAMREP's activities and spearhead research in clean energy technologies in Namibia

### 1.3 The Role of Renewable Electricity in Namibia

Approximately 50% of Namibia's electrical energy is imported from South Africa, the Southern African Power Pool (SAPP) and Zimbabwe. Total electrical energy consumption for Namibia reached **3,219GWh** per annum in 2007, compared to **3,163GWh** in 2006 (NamPower, 2007). Considering all solar energy technologies installed in Namibia the solar energy consumed in 2007 was approximately **6.4GWh**. Despite recent Cabinet Directives[2] and developments on electricity tariffs where average cost of electricity has increased by over 14% per annum, the application of renewable energy technologies is still very low. The low penetration of renewable energy in the Namibian energy sector is partly due to:

- Cost un-competitiveness of renewable energy largely due to an uneven playing field,
- Low electricity tariffs in the past and the high cost of (mostly imported) renewable energy generators,
- Lack of an appropriate regulatory framework that supports renewable electricity,

2 In June 2007, the Namibian Cabinet directed that all government and parastatals buildings›, water heating needs must be met through the installation of solar water heaters. The 2nd directive was to the Ministry of Mines and Energy to make sufficient budgetary allocations for the implementation of the Off-Grid Energisation Master Plan concept to be used for off-grid areas to get access to clean energy.

- Lack of awareness regarding the cost and socio-economic advantages of generating electricity from renewable energy resources.

Recent studies by the Renewable Energy and Energy Efficiency Institute (REEEI), NAMREP, and the Ministry of Mines and Energy (MME), indicate that there is considerable potential for large-scale deployment of renewable energy.

### 1.3.1 Renewable Electricity Options in Namibia

Namibia has significant renewable energy resources such as solar radiation (**5.4 - 6.2kWhr/m$^2$/day**)[3], wind (annual average speeds of **6.8 - 7.5m/s** in Walvis Bay and Lüderitz)[4] and considerable biomass material in the form of invasive bush which covers over 26 million hectares of grazing land. Ironically, the contribution of renewable energy in 2006 was **8,240GJ** out of a total of **57,047,895GJ** (including petroleum) of energy consumed in the country, (REEEI, 2008). This figure is less than 1% of total energy consumed. In Namibia, renewable energy technologies are widely being used in off-grid energisation and for domestic water heating. Potential technologies that can be deployed at large scale in the country are solar concentrating power, bush to electricity and wind. Photovoltaic technology will continue to play an important role in off grid electrification and solar water pumping.

A sustainable energy policy must be based on three goals; i.e. secure supply, profitability and environmental protection. In its Millennium Statement in 2007, the World Energy Council (WEC) established three sustainability objectives, coined the three A's as the basis for its analysis of the project, "Energy Policy Scenarios to 2050" (World Energy Council, 2007). The 3A's are **A**ccessibility to modern and affordable energy for all; **A**vailability in terms of continuity of supply and quality and reliability of service; and **A**cceptability in terms of social and environmental goals. The achievement of the three A's is largely determined by the social, political, and economic environment - and the extent to which these factors facilitate or hinder

3 ACACIA sub-project E1, University of Cologne, Atlas of Namibia Project, 2002. The project was conducted for the Ministry of Environment and Tourism.

4 TERNA GTZ: Project Studies for Wind Parks in Walvis Bay and Lüderitz, 1999.

sustainable energy development. High government (both central and local) engagement, high cooperation and integration are the key to a achieving a sustainable energy policy. Solar, wind and biomass are the resources that are at a level in Namibia where with appropriate policy framework they will meet the 3A's mentioned.

A study by EMCON Group for REEECAP titled, "Electricity *Supply and Demand Management Options for Namibia-A Technical and Economic Evaluation"* identified and ranked different renewable energy technologies in Namibia in terms of benefit-cost-analysis as well as other parameters like technological maturity. According to the study the use of some renewable resources is economically efficient and that within a balanced generation mix up to 20% of demand could be met by renewables excluding hydro power.

Hydro electricity projects in Namibia are subject to intense geo-political considerations because all the rivers with current and potential hydro power generation are situated along international boundaries and their sources of origin are outside Namibia. Sites under consideration are Baynes (360MW), and Orange River (mini hydro stations of up to 70MW). The cost of Baynes is estimated at USD$640milion (SAPP, 2008) and the plant will be operated as base-load to mid-merit. The Baynes power station maybe used as load following plant since it is much easier to operationally regulate a hydro power plant.

Bush to Electricity has wide social and economic acceptance. The estimated cost of bush encroachment to the national economy was N$700million per year in 2004. This cost comes from reduced livestock grazing land. Farmers use different methods of combating bush encroachment from mechanical cutting, slash burning, charcoal production to herbicides. Electricity maybe generated from this particular plant material through gasification or direct fed into boiler furnaces. However, there is still need of a detailed investigation into technical and socio-economic aspects of bush to electricity. The investigations should look at the optimal generator types and sizes, appropriate methods of harvesting the bush, operation and management of the generating plants and grid stability arising from distributed generating plants. Harvesting the bush by manual means has the potential to create massive unskilled jobs. Biomass based electricity generating plants have an advantage of being dispatchable due

to the stored energy in the biomass which allows the power plant to be utilised as base-load to mid-merit plant. Emcon (REEECAP Study, 2008) estimated investments costs for gasification plant and grid integration hardware at NAD 16.7 million/MW in 2007.

Wind power has great potential along Namibia's coastline namely in Walvis Bay and Luderitz. Between 40 and 80MW can be generated from wind with added benefits of direct and indirect jobs being created. The most likely direct jobs in Namibia are in the installation and maintenance of the wind turbines. The jobs will be by utilities, developers, installers and maintainers, consultants, as well as in research and development (R&D). In the EU with an installed capacity of 56 GW of wind in 2007, the sector directly employed approximately 108,600 people in that year (EWEA, 2009). For a country with the capacity to design and manufacture wind turbines and related components the jobs in the wind energy sector will come to 15.1 jobs/MW (EWEA, 2009). Namibia does not have the capacity to manufacture turbines and components meaning that the sector may only generate up to 6.2 jobs/MW. In Greece, 1800 direct jobs with erection specialists, tower and crane manufacturers as well as engineering and R&D were available in 2007. Local economies along the towns of Walvis Bay and Luderitz will definitely be transformed with wind developments as is the case with Schleswig-Holstein in Germany and the region of Navarre in Spain which are the wind pioneering regions. The overnight cost of wind power plant is in the range of US$1.7million/MWe but this varies greatly with factors such as cost of land, labour, and the cost and size of wind converters and related equipment.

Concentrating Solar Power (CSP) is emerging behind wind as a significant potential source of large scale renewable electricity with an installed global capacity of 431MW in 2008. Projects of 4500MW capacity are currently at various stages of planning and implementation from Spain, United States of America and North Africa. Ideal conditions for CSP plants are; high direct insolation (>2000kWh /m²/year with minimal cloud cover), flat topography**,** close to a load centre or transmission lines and water for steam generation and cooling. Namibia's solar radiation is exceptionally high averaging 2300 kWh /m²/year in the south of the country which is generally flat. Considering investments for CSP plants, the solar field takes between 50% and

70% of total investment costs followed by storage and the power block (RENAC, 2009). Investments costs for CSP plants vary between US$3million to US$7million/MWe. CSP technology is receiving a lot of attention from utilities to equipment suppliers and researchers such that costs are expected to considerably come down in the next 5 to 10 years.

Integrated Solar Combined Cycle technology is a *hybrid* of solar thermal technology (CSP) and natural-gas-fired combined cycle which is gaining popularity with utility and energy developers to ensure 24 hour operation cycle of the power plant without necessarily investing in expensive storage systems for the solar component. Kudu gas could be combined with the CSP technology to provide the required base-load station for Namibia.

Other technologies such as geothermal and ocean energy require detailed and intensive research before they can be considered as medium term power supply options. For geothermal there is need for further exploratory work by the Geological Survey, research institutions and investors. Ocean energy covers a series of emerging technologies that use the power of ocean temperature gradients, currents, waves, and tides to create energy. While very few of these technologies have been implemented on a commercial scale worldwide, they show much promise for future development. Further technological research is required.

### 1.4 Policy Recommendations on Renewable Electricity in Namibia

There are as many barriers to the entry of renewable energy into mainstream energy economies as there are different such technologies. Conditions that are necessary for large deployment of renewable energy are; government policy covering issues such as tax credits and import duty; a conducive regulatory framework with market instruments such feed in tariffs -and quota systems and mandates; and skills to research on and manage the technologies, advise on policies and implement the designed polices.

One undisputed fact is that those countries that have experienced phenomenal growth in these technologies and managed to successfully install megawatts (MW) of renewable

electricity have done so behind a massive energy policy shift. They have moved towards market based instruments to reduce the costs of promoting pre-commercial stage technologies. The main instruments are the renewable energy feed in tariff (REFIT) law and a quota system with green trading certificates. The REFIT law has allowed countries such as Germany, to capture a huge chunk of the global renewable energy market, allowed its citizens, farmers, businesses and community groups to invest in renewable energy successfully and easily, created towards a quarter of a million jobs, saved millions of tons of greenhouse gases each year (BMU, 2007).

The various intervention and support mechanisms for renewables from the Government of the Republic of Namibia mean that there is recognition that market forces alone cannot allow such technologies to gain ground and contribute significantly without deliberate support mechanisms in one form or the other. Current positive initiatives on developing a new Energy Regulatory Framework provide an opportune window to introduce suitable mechanisms such as REFITs or quota system or both. Other traditional instruments such as tax exemptions, soft loans, investments grants, etc, compliment these two principal instruments. One thing for sure is that feed in laws must be designed with a country's specific resources, renewable energy targets, social systems, and electricity systems, institutional and technological structures in mind. The introduction of REFITs should be done in such a way that Namibians themselves benefit by being power producers themselves. It must be an opportunity to economically empower Namibians.

Besides these regulatory instruments, Namibia requires an integrated resource plan which will guide the country by ranking its resources for power generation and guide investors in making their decisions in line with the country's priorities. Specific national targets on renewable electricity are needed to provide and guide the vision of the country. For instance South Africa has a national target of 10TWh to come from renewable energy in 2013.

For concrete results in renewable energy promotion, Namibia requires to design a three level policy scheme like in China and the United States of America. The central government establishes the first two levels of policy. Local governments, including regional and municipal

governments, establish the third level of policy with overall direction from the central government. **First-level policies** will provide general direction and guidance, as outlined in the short-term national developments plans and long term plans relating to the global environment. **Second-level policies** will specify goals or objectives and development plans, and focus on rural electrification, renewable energy-based generation technologies and biofuels utilization. These policies attempt to standardize the directions, focal points, and objectives of renewable energy development from different viewpoints. Some departments propose concrete policies and regulations. According to the National Renewable Energy Laboratory, **Second-level policies** have played a very important role in promoting renewable technologies in China. **Third-level policies** consist of practical and specific incentives and managerial guidelines. These outline specific supporting measures for developing and using renewable energy such as subsidies, tax relief, feed in tariffs, etc. These third-level government policies provide crucial support to help develop renewable energy in its early growth stages.

## 1.5 CONCLUSION

Renewable energy not only has the potential to satisfy Namibia's increasing electricity demand in a sustainable manner; it is also a significant and vital stimulus to its economy. Greater energy independence, lower energy costs, reduced or avoided future risk of increased fuel prices; improved competitiveness; reduced greenhouse gas emissions; increased technology exports and major employment opportunities are among the low-hanging fruits the technology has to offer. Conventional plants generating power from fossil and nuclear fuels use large amounts of water for cooling; wind turbines do not use water on top of other environmental benefits. With specific policies and firm targets, solar, wind and bush (biomass) are the renewable resources with great potential to be readily harvested and contribute significantly to electricity generation in Namibia. These resources are abundant and the accompanying technologies are mature.

## 2. POLICY PLANNING FOR A LOW CARBON PATH FOR NAMIBIA

### 2.1 Introduction

*The low carbon path referred to in this section is related to the electricity sector only*. The United Nations Framework Convention on Climate Change (UNFCC) Second National for Namibia declared the country a net carbon sink largely because of low carbon intensive industrial activities relative to growing vegetation cover. However, if the vegetation cover in the form of invasive bush material on farmlands is removed to increase cattle pasture, then the tables might turn. Invasive bush material has been touted by some as one of the solutions to Namibia's power crises. The major risks on the Namibia electricity market consist of insufficient investments in both base–load and peak production capacity and relatively low electricity tariffs. Even at regional, SAPP, level these risks have translated into low prices at Short-Term Energy Market (STEM) due to imperfect competition. The restructuring of the electricity supply industry which created the Electricity Control Board (ECB) and saw the later issuing conditional generation licences under the IPP framework has not resulted in the desired outcome of any meaningful investment in the industry.

The low penetration of renewable energies in the Namibian energy sector yet their abundance and apparent benefits are known, needs to be addressed. The persisting barriers to the development of renewable electricity and the low level of competition in the electricity market imply that there is a need for policy intervention. The purpose of the policy is to govern the approach of renewable energy and energy efficiency market development in Namibia by facilitating fair market access, return on investment, quality of supply, standards, market support structures and incentives and legal issues. It is envisaged that the critical mass created by an enabling environment through the incorporation of provisions of renewable energy and energy efficiency in the new policy will eventually lead to a self sustaining clean energy market.

## 2.2 The Electricity Policy and Planning Framework

The 1998 White Paper on Energy Policy states that the establishment of the necessary legal, regulatory, fiscal and environmental frameworks to create a favourable investment climate is a requirement. The restructuring of the electricity supply and distribution industry in Namibia commenced with the passing of the Electricity Act of 2000 which was followed by the establishment of the ECB as the independent regulator of the industry and the statutory requirement to have a licence to participate in the electricity supply industry. These efforts should not end there and neither should they be done piecemeal although they may take a stepwise approach.

Awerbuch & Yang (2004) argue that "traditional energy planning in Europe and the United States focuses on finding the least-cost generating alternative. This approach worked sufficiently well in a technological era, marked by relative cost certainty, low rates of technological progress, and technologically homogenous generating alternatives and stable energy prices. However, today's electricity planner faces a broadly diverse range of resource options and a dynamic, complex, and uncertain future." In order to achieve an appropriate generation mix for energy security based on a balance of economically efficient and sustainable sources the Government must create an enabling environment.

The New Energy Regulatory Framework being pursued by the Ministry of Mines and Energy (MME) must provide a guiding framework to address the challenges and take advantage of various opportunities coming up in the different energy sectors of the country. The Namibia Energy Regulatory Framework Steering Committee (NERSC), drawn from the gas, petroleum, electricity, renewable, regulator and government, must provide a coordinated approach to the development of a national energy regulatory policy framework for Namibia taking into consideration the specific needs of each energy sector in order to ensure an efficient and harmonised energy regulatory environment. Such a comprehensive approach will ensure that no sector will be omitted and that there is optimisation in the best options to be pursued. To ensure citizen engagement information shall be solicited from the public through debates and focus group meetings and studies.

The restructuring of the industry posses the risk of fragmented investment and development of electricity generation projects in a liberalized economy. Namibia requires a national integrated resource plan for new generation stations to mitigate the risk of over-investment while ensuring sufficient supply to meet demand. Key policy decisions need to be included in the resource plan regarding how much generation must be sourced from local resources and what proportion must come from renewable energy resources, which generation options should be developed further, responsibilities for implementation and method/s for procurement. The Ministry of Mines and Energy should play a leading role in coordinating the drafting of national integrated resource plan and ensure its implementation.

## 2.3 Concrete Steps in Future Energy Plans

The new Energy Regulatory Framework provides the first necessary steps in developing a comprehensive environment for determining the future Namibia requires for sustainable energy security.

The second stage will involve setting up targets, identifying appropriate laws and acts and administrative institutions to support the policy. There is a wide range of market-based instruments Namibia may use to promote renewable electricity. These can be divided between the traditional investment support (capital grants, tax exemptions or reductions on the purchase of goods) and operating support (price subsidies, green certificates, tender schemes and tax exemptions or reductions on the production of electricity- the feed in tariffs and quota systems). Introduction of tariff measures will give private producers incentives to invest in peak capacity to supplement base load investments on top of investment in renewable energies.

The integrated resource plan will derive its inputs from the Energy Regulatory Policy Framework which would have spelt out the role of different sectors in the future generation portfolio. The plan is a strategic plan that provides precise information to would be investors that have proved evasive in the past 9 years since the restructuring of the industry. The policy plans must exhaustively explore leveraging sustainable energy projects with the carbon market

although Namibia is, regrettably, set to miss out on the current Kyoto Protocol bonanza. The voluntary carbon market is set to grow tremendously especially now that the new United States of America political regime is choosing a low carbon path for their economy.

With appropriate policies and meticulous energy strategic planning which is followed up with implementation; the future is bright for Namibia.

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