



renewable  
energy  
& energy  
efficiency  
partnership

# Namibia

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## Section 1: Energy provision<sup>1</sup>

### 1.1 Main fuel sources for direct use and power generation

The energy sources used in Namibia include gas fields, hydro and thermal power stations, small diesel generators, and hydroelectric power stations. Liquid fuel is regarded as the biggest energy source. It is estimated that almost 60% of energy consumed is attributable to liquid and gaseous fossil fuel use, while some 25% of energy consumed is in the form of electrical energy. Biomass accounts for almost 15% of the total energy used, while other renewable energy sources contributes the remainder, i.e. less than 1%.

### 1.2 Degree of reliance on imported energy

Namibia relies strongly on imports for coal, gas and coke. Almost 50% of the country's electricity needs are met by imports, with South Africa and Zimbabwe as the main external suppliers. All liquid and gaseous fossil fuels, including petrol, diesel, heavy fuel oil, jet fuel, liquid petroleum gas and coal are imported, mainly from South Africa. In light of current energy market developments in southern Africa, this dependency is expected to remain in place for a considerable time. A special arrangement between NamPower and ESKOM, the South African Power utility, enables Namibia to buy and utilise the surplus energy from South Africa at affordable rates. Due to the current capacity problems that ESKOM is facing, NamPower and Namibia have to look at alternative power generation sources.

### 1.3 Extent of connection to electricity network (households and businesses; rural and urban)

It is estimated that more than 70% of the urban areas and some 15% of rural households are connected to the electricity network. Most households do not have access to commercial electricity, and for 2008 the electrification rate was 34%. The country's electricity transmission and distribution systems are considered well-developed. Existing transmission infrastructure from South Africa is currently strengthened by the Caprivi inter-connector, which will link Namibia to Zambia and Zimbabwe.

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<sup>1</sup> <http://www.greeneconomyinitiative.com/news/181/ARTICLE/1445/2009-02-12.html> ,  
<http://www.nampower.com.na/pages/generation.asp> ,  
<http://www.undp.org/climatechange/docs/Namibia/Namibian%20national%20issues%20report%20on%20key%20sector%20of%20energy.pdf>

#### **1.4 Any capacity concerns (power generation and/or transmission/distribution)**

NamPower has three power stations: Ruacana - Hydro - 240 MW, Van Eck - Coal - 120MW, and Paratus - Diesel - 20 MW. Namibia's total installed electricity generation capacity in mid-2008 was 387 MW. Namibia's energy intensity is attributable to: the dominant economic sectors such as mining and agriculture which are highly energy dependent, the country's low population density coupled to high domestic energy use, the long transport routes to the country and between the few major centres within Namibia, and the high reliance on imports of fuels, consumer goods and manufactured products. The country faces a shortfall of power.

The country is rolling out the 9-billion Namibian dollar (\$910,4-million) investment programme to increase generation capacity, and expand and upgrade the transmission network, according to Fitch ratings agency. Namibia's Deputy Mines and Energy Minister said the plans include upgrading a thermal power station and building a new coal power plant. It is expected that the output at the thermal power station at Walvis Bay will be expanded to 50 megawatts. The construction of several power plants is also envisaged. However, the growth of the Namibian electricity industry is seriously hampered by the lack of finance.

#### **1.5 Potential for renewable energy, energy efficiency and co-generation (i.e. any authoritative assessments)**

The country has developed a hydro power Master Plan. A study on all perennial rivers has been performed. The aim of the study was to identify and estimate cost and production for all potential hydro power projects in the Lower Kunene, Kavango and Lower Orange rivers. Solar, wind and biomass are also regarded as potential sources of renewable energy.

Projects have been developed to install solar energy systems in rural areas without access to the national electricity grid. In 1993, the Ministry of Mines and Energy launched a programme for the "Promotion of the Use of Renewable Energy Sources in Namibia". It is estimated that the current network configuration would allow up to 20 MW as the largest possible wind park size.

The Ministry of Mines and Energy, Directorate of Energy, in 1996 initiated a process to develop the use of biomass energy for cooking and heating. A National Steering Committee on the National Biomass Energy Conservation Program, reporting to the National Energy Council, was established in June 1998. The main objective of this committee is to put in place a national biomass energy management strategy and plans that will contribute to the sustainable utilisation and supply of traditional biomass energy for private households and industries in Namibia.

In 2003, the Namibian government established the Namibian Renewable Energy Programme (NAMREP) to tackle these problems. The Ministry of Mines and Energy, through the Namibia Renewable Energy Programme (NAMREP), released a study in August 2006 entitled "Feasibility Assessment to replace Diesel Pumps with Solar Pumps".

A cabinet directive dated 2007, made solar water heaters mandatory for all public and semi-public buildings.

## Section 2: Energy market<sup>2</sup>

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<sup>2</sup> [http://www.coreintl.com/core\\_library/TechnicalAssistanceforNamibia.doc](http://www.coreintl.com/core_library/TechnicalAssistanceforNamibia.doc)

## **2.1 Ownership (state/municipality/private/mixture) of electricity and gas utilities and other sources of energy**

With the restructuring of the electricity distribution sector, NamPower is gradually exiting direct distribution, but will continue to be involved in distribution via shareholding in the REDs (Regional Electricity Distributors companies)<sup>3</sup>. NamPower is responsible, through the Single Buyer Business Unit, to buy electricity outside Namibia and sell inside the country.

## **2.2 Extent of competition in power generation and energy retail**

Namibia has taken a number of steps to open the Namibian energy market to Independent Power Producers (IPPs).

## **2.3 Structure: extent of vertical integration of generation / transmission / distribution/ retail.**

As previously mentioned, NamPower is gradually exiting direct distribution, but will continue to be involved in distribution via shareholding in the REDs. Broad-based support has been expressed for the proposed 'Single Buyer' model (SB) as the basic market structure in the medium term. However, stakeholders have commented on the need for Namibia to be able to move to a competitive market structure (initially at wholesale level) in the longer term, to be in line with developments internationally and throughout Southern Africa.

# Section 3: Energy policy framework

## **3.1 Existence of an explicit energy policy framework and key policies– what role is envisaged for sustainable energy?**

Through the Energy White Paper, 1998, the Government has committed itself to introduction of renewable energy sources: "Government will promote the use of economically viable renewable energy technologies, as a complement to grid electrification, to improve energy provisions to rural areas." The Ministry is actively promoting the use of new energy sources. The key objectives for Namibia are:

- To source power supplies for Namibian consumers in the most cost-effective manner, including the optimum utilisation of local generating assets;
- To ensure a reliable supply of power that promotes Namibian growth and development; and
- To increase diversity of supply and promote the use of local energy resources.

## **3.2 Any current energy policy debates/developing legislation**

Despite a favourable regulatory electricity sector regime, and an established Independent Power Producer framework, foreign investments in Namibia's energy sector remain very limited. Broad-based support has been expressed for the proposed 'Single Buyer' model (SB) as the basic market structure however, stakeholders have commented on the need for Namibia to be able to move to a competitive market structure.

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<sup>3</sup> In the year 2000, Namibia restructured its energy sector by selecting a Single Buyer Market Model.

### **3.3 Any specific policies or programmes to promote sustainable energy**

See paragraph 1.5 for further information.

### **3.4 Any major energy network or sustainable energy studies available**

See paragraph 1.5 for further information. Various studies have also been conducted regarding the reform of the energy sector. A Study of the Restructuring of the Namibian Electricity Supply Industry (ESI) has been conducted. The agreed objective of the study was to make recommendations on possible future structures, which would enable the ESI to continue to be the engine for economic growth, development and prosperity in Namibia in an effective and efficient manner.

### **3.5 Role of government in energy policy – which departments are involved?**

The Ministry of Mines and Energy is the custodian of Namibian energy resources. Its role is to ensure the adequate and affordable energy supply in a sustainable manner taking advantage of our natural resources in support of the nation's socio-economic development. Its objectives include:

- Security of supply: to secure sufficient and reliable supply of sustainable energy to support the growing needs and the Government's endeavour to develop new industry.
- Social upliftment: to redress inequalities in the provision of energy supplies, and ensure that all households shall have access to affordable and appropriate energy supplies.
- Economic competitiveness / economic / efficiency: to ensure that increases of energy supply and utilization are sustainable, competitive and economic efficient.
- Effective energy sector governance: Namibia will have energy sector governance in operation, that will undertake effective planning, is flexible in its approach, and that has adequate staff resources.
- Investment and growth: Namibia will endeavour to achieve a high level of investor confidence in the energy sector, resulting in fixed inward investment and economic benefits for the country.
- Sustainability: Namibia will move towards the sustainable use of natural resources for energy production and consumption as far as is economically possible.

The Directorate enforces the compliance of legal requirements of energy legislation and regulations and conduct researches on new and renewable sources of energy. It conducts functions such as:

- Petroleum product pricing and price equalization and the administration of the
- National Energy Fund
- Regulating the Petroleum Exploration and Production Industry
- Depot fire fighting and security
- Petroleum product import and export control
- Rural electrification
- The administration of the Solar Electrification Revolving Fund
- Issuing of Petroleum Licenses

The Namibian Electricity Authority was formed in 1964, currently known as NamPower<sup>4</sup> since 1996. It falls under the Minister of Mines and Energy but operates on a fully autonomous commercial basis provides electricity to clients directly and to municipalities.

### **3.6. Any government (or government funded) agencies with a specific role in sustainable energy and/or environmental protection (with an energy role)**

The main ones include: the Ministry of Trade and Industry (MTI), the Ministry of Finance (MoF), the National Planning Commission (NPC), the Ministry of Mines and Energy (MME), the national electricity utility NamPower, and the liquid fuels provider Namcor.

### **3.7 Any energy planning procedure in place**

There is an integration of energy as a cross-cutting topic into the national vision and development plans, specifically "Vision 2030". The abovementioned Energy White Paper and the latest development in the sector seem to identify the following matters as priority issues to address to ensure the sustainability of the energy sector:

- diversification of the national supply of liquid and gaseous fuels
- promoting and incentivising the productive use of energy, for example through favourable taxes, tariffs, national targets and other measures
- strengthening a rapidly expanding electricity market to ensure that the economy as a whole and specifically the energy-intensive sectors such as mining are adequately provided for, and attract third-party investments and participants
- incentivising energy efficiency practices in the public and private sectors
- implementing demand management and active demand market participation throughout the electricity sector value chain
- incentivising the development of indigenous carbon-neutral energy resources through favourable tax and tariff regimes, the establishment of national renewable energy generation targets, and the financial support of research and development programmes and projects through Government
- incentivising the establishment of decentralised Independent Power Producers, for example through national targets, introducing favourable tariff regimes, and tax incentives/rebates.

## **Section 4: Energy regulation**

### **4.1 Is there an energy or utility regulator? When was it established?**

The Electricity Control Board<sup>5</sup> is a statutory regulatory authority established in terms of the Electricity Act, 2000 (Act 2 of 2000). The Electricity Control Board (ECB) is being strengthened on a regular basis. Its vision is to:

- To be a dynamic, efficient and environmentally sensitive regulator
- Provide effective leadership to the electricity supply industry (ESI)

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<sup>4</sup> <http://www.nampower.com.na/Pages/more-nampower.asp>

<sup>5</sup> <http://www.ecb.org.na/show.php?m=1&sm=0>

- Be the architect of a sustainable, dynamic and efficient ESI
- Achieving a competitive and transparent electricity market in Namibia

#### **4.2 Degree of independence of the regulator from government**

The Electricity Control Board's mission is to control and regulate an efficient Namibian ESI in a transparent and fair manner for the benefit of all stakeholders. The regulator has a fair level of independence.

#### **4.3 Regulatory framework – legislation, duties, powers (any references to environment, sustainable energy)**

Namibia legal framework in terms of energy can be characterised as sophisticated. Various Acts have been promulgated regarding the different sources of energy and electricity including as the most recent and main acts:

- Petroleum Products and Energy Act, 1990, which regulates the price at which the refined petroleum products may be sold, and makes provision for the establishment of the National Energy Council and the National Energy Fund.
- Petroleum Products and Energy Amendment Act, 2000: which amends the Petroleum Products and Energy Act, 1990, so as to grant more comprehensive powers to the Minister of Mines and Energy to make regulations, more particularly relating to the import, supply, storage, possession and sale of petroleum products, the licensing of and conducting of business by wholesalers, resellers and consumer installation operators, the application of health, hygiene, safety and environmental standards and requirements, and minimum specifications as regards standards of facilities, structures and equipment and restrictions on the sale and use of petroleum products; to provide for reasonable and just contractual rules and principles in the petroleum industry; to provide for increased penalties for contravention in certain cases of the regulations and the Act; and to provide for incidental matters.
- Petroleum Products Regulations, 2000 which regulates the import, supply, storage, possession and sale of petroleum products, the licensing of and conducting of business by wholesalers, resellers and consumer installation operators, the application of health, hygiene, safety and environmental standards and requirements, and minimum specifications as regards standards of facilities, structures and equipment and restrictions on the sale and use of petroleum products; to provide for reasonable and just contractual rules and principles in the petroleum industry; to provide for increased penalties for contravention in certain cases of the regulations and the Act; and to provide for incidental matters.
- Petroleum Products and Energy Amendment Act, 2003
- National Energy Fund Act of 2000 which provides for the establishment of the National Energy Fund and its organization.
- Petroleum (Exploration and Production) Act 1991 (Act 2 of 1991) which defines the different types of licenses (reconnaissance, exploration and production) and their terms and conditions.
- Petroleum (Exploration and Production) Amendment Act 1993 (Act 2 of 1993) which amends the Petroleum (Exploration and Production) Act, 1991, to provide for agreements to be concluded between the Minister of Mines and Energy and license holders relating to training programmes and contributions to the Petroleum Training and Education Fund; and to provide for matters incidental hereto.

- Electricity Act, 2000 (Act No. 2 of 2000) which provides for the establishment and functions of the Electricity Control Board.
- Electricity Regulations: Administrative (Electricity Act, 2000)
- Electricity Act 2007 (Act No. 4 of 2007)

#### **4.4 Regulator's roles – key tasks (e.g. price controls, promoting competition etc), actions to date, any action/role in the sustainable energy field)**

The Electricity Control Board has the core responsibility of regulating electricity generation, transmission, distribution, supply, import and export in Namibia. In the execution of its statutory regulatory functions the affairs of the Electricity Control Board are managed by a Technical Secretariat headed by a Chief Executive Officer. The Electricity Control Board also provides for:

- Licenses
- Tariff approval
- Strategic Forward Planning
- Internal Support Functions

#### **4.5 Role of government departments in energy regulation (both where a regulator exists and where there is no regulator)**

The Minister of Mines and Energy is the main government agency regarding the energy sector. The role of municipalities in the energy sector seems currently limited; however it seems to be an intention to integrate them more cohesively in the sector.

#### **4.6 Have any regulatory barriers to sustainable energy been identified and if so what are they?<sup>6</sup>**

It seems that the energy sector in Namibia faces a number of challenges, including:

- Major investment requirements in the short to medium term - in generation, transmission and distribution infrastructure and operations;
- Loss of economies of scale due to a fragmented nature of the sector;
- Human resource constraints with negative implications for efficiency and delivery;
- Diverse financial performance of electricity distributors, with adverse consequences for financial viability and sustainability;
- An inability of many of the current distributors to plan, finance and sustain electrification programmes in their areas of supply;
- Low electricity tariffs;
- One-sided market rules (especially the single buyer arrangement mentioned earlier);
- Limited investment opportunities;
- Absence of tax and investment incentives to introduce new technologies and level the playing field between established and new sector participants;
- Lack of national renewable energy targets and / or other measures to incentivise the introduction of carbon-neutral generation capacity; and

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<sup>6</sup> [http://www.mme.gov.na/energy/electricity/esj\\_public\\_presentation\\_document.htm](http://www.mme.gov.na/energy/electricity/esj_public_presentation_document.htm)

- The size of the Namibian electricity market which makes it difficult to develop a competitive wholesale market within the country

It also seems that one major obstacle impeding the introduction of renewable energy sources is the fact that the cost of energy from these options is still more expensive than their alternatives. The Ministry has introduced a revolving fund which supports families and individuals not connected to the electricity grid that want to invest in solar home systems.