

GOVERNMENT OF THE REPUBLIC OF NAMIBIA

MINISTRY OF MINES AND ENERGY

NATIONAL ENERGY POLICY

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Foreword

To be added upon finalisation.

Acronyms and Abbreviations

APT	Additional Profit Tax
AU	African Union
CSP	Concentrating Solar Power
CSP TT NAM	Concentrating Solar Power Technology Transfer for Electricity Generation in Namibia
DSM	Demand Side Management
ECB	Electricity Control Board
EDI	Electricity Distribution Industry
EE	Energy Efficiency
EIA	Environmental Impact Assessment
EPUC	Energy Policy Update Committee
ESI	Electricity Supply Industry
GWh	Giga-Watt-hour
HPP	Harambee Prosperity Plan
IEA	International Energy Agency
INDCs	Intended Nationally Determined Contributions
IPP	Independent Power Producer
kWh	Kilo-Watt-hour
LPG	Liquid Petroleum Gas
MME	Ministry of Mines and Energy
MW	Mega-Watt
NAMCOR	National Petroleum Corporation of Namibia
NamPower	Namibia Power Corporation
NEC	National Energy Council
NEF	National Energy Fund
NEI	Namibia Energy Institute
NERA	Namibia Energy Regulatory Authority
NIRP	National Integrated Resource Plan
NPC	National Planning Commission
NUST	Namibia University of Science and Technology
OGEMP	Off-Grid Energisation Master Plan
PIT	Petroleum Income Tax
PPA	Power Purchase Agreement
RE	Renewable Energy
RED	Regional Electricity Distributor
REDMP	Rural Electricity Distribution Master Plan
RERA	Regional Electricity Regulators Association
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SDG	Sustainable Development Goals
TWh	Tera-Watt-hour
UN	United Nations
UNAM	University of Namibia
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WPEP	Namibian White Paper on Energy Policy of 1998

Glossary and Definitions

Term	Definition
access to modern energy	A household has access to at least one type of electricity service, as well as clean cooking facilities.
access to at least one type of modern energy	A household has access to at least one type of electricity service, and/or clean cooking facilities, or both.
affordable energy	For households: using a reasonable amount of modern energy at a cost which is affordable to the household. For businesses and industries: using an efficient amount of energy at a cost that can be reasonably recovered from customers without rendering the business uncompetitive.
bioenergy	In the context of this document, 'bioenergy' includes energy sources such as solid woody biomass, biogas, as well as liquid fuels derived from organic matter, as well as their derivative products.
clean energy	Energy that does not pollute the atmosphere and environment when used.
energy self-sufficiency	Local energy needs that are always fully supplied from local energy resources and associated infrastructure.
energy security	Energy supply that fully meets the expected demand with appropriate reserves maintained in a sustainable manner and at an acceptable risk level.
fuel security	Fuel supplies that fully meet the expected demand with appropriate reserves maintained at an acceptable risk level.
IPP	A generation licensee other than NamPower.
modern energy	In the context of access to energy, <i>modern energy</i> is used to describe energy carriers that do not involve the burning of non-sustainable supplies of wood, the use of candles or paraffin, or the reliance on non-reusable batteries.
sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
universal access to modern energy	Every household uses at least one type of modern energy, unless they choose not to.

Executive Summary

To be added upon finalisation.

1 Introduction

1.1 Rationale, Process and Structure of the National Energy Policy

1.1.1 Rationale

Independent Namibia's first energy policy was developed between 1996 and 1998, and resulted in the White Paper on Energy Policy of 1998. For almost twenty years, this document provided the overall guidance for developments in the Namibian energy sector. During this time, the country's economy in general, and the energy sector underwent substantial changes. In view of the considerable changes in the context of national circumstances, Government decided to take a fresh look at the country's energy policy: to update it to better serve present needs and to prepare for the future.

In keeping with Government's mandate to guide the development of the country's energy sector, this National Energy Policy spells out **Government's intent, direction and undertakings** regarding the Namibian energy sector. One of the National Energy Policy's main aims is to communicate Government's intentions, to mobilise stakeholders to contribute to the creation of a common energy future for the country. To this end, the policy statements contained in this document serve as a reminder to Government of what it set out to accomplish, as well as provide a common direction to all actors participating in the country's energy industry.

1.1.2 Policy Formulation Process

In early 2016, the Ministry of Mines and Energy, as the Government entity responsible for establishing policy in the country's energy sector, appointed an Energy Policy Update Committee (EPUC) and tasked it to oversee and steer the process of updating the country's energy policy. The EPUC, which has representation from key stakeholder institutions from across the energy sector, drafted a Terms of Reference document and identified and appointed a Namibian consulting team to assist with the development of the policy and the stakeholder engagement process.

Figure 1 depicts the policy development and stakeholder engagement process followed by the EPUC.

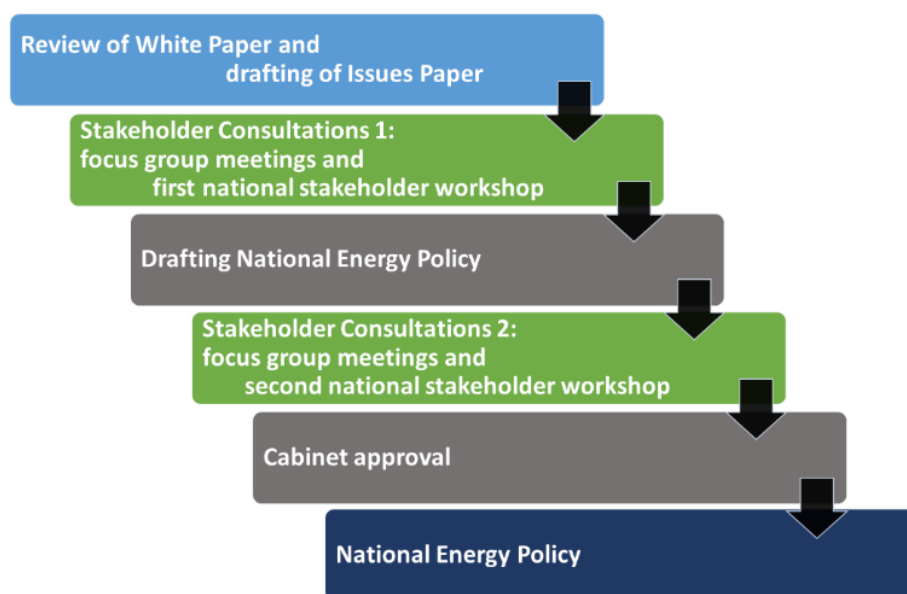


Figure 1: Energy Policy Development Process

The review of the White Paper on Energy Policy resulted in an Issues Paper that highlighted eight main policy themes which were to be addressed in the to-be-developed energy policy. The Issues Paper, specifically the main policy themes, was then presented to a wide variety of national stakeholders for comment and input. This process resulted in eight focus group meetings that were held in six locations throughout the country, as well as a first National Stakeholder Workshop that was held in Windhoek. From the initial stakeholder interactions and inputs, a draft concept for the country's energy policy was developed and introduced for further discussions during the first National Stakeholder Workshop. Participants included individuals and members of various civil society groups, representatives of organisations in the oil, gas and electricity industries, local and regional authorities, Regional Governors, representatives of consumer and special interest organisations, and Government ministries.

Based on the initial Policy concept, which was amended based on stakeholder inputs, a first draft of the National Energy Policy (NEP) was prepared, and then subjected to public scrutiny through a second round of eight focus group meetings that were held in six locations around the country. After further updates and refinement, taking stakeholder inputs into account, the draft final version of the National Energy Policy was presented and discussed at a second National Stakeholder Workshop in Windhoek, February 2017. Following these consultations, the National Energy Policy was finalised.

Parallel to the development of the National Energy Policy (NEP), the Renewable Energy Policy, the Independent Power Producer Policy, and the National Integrated Resource Plan (NIRP) were developed. At the same time, and parallel to the National Energy Policy, both the Namibia Energy Regulatory Authority Bill and the Electricity Bill were developed. Both NEP and EPUC team members were involved in these activities, resulting in the establishment of close co-ordination between and amongst these different development efforts.

1.1.3 Structure of this Policy

The remainder of this National Energy Policy document is structured as follows:

- Section 1 introduces the national context in which the NEP is to be applied
- Section 2 describes the overarching policy framework used in this document
- Section 3 presents the main policy statements
- Section 4 presents the implementation framework for the National Energy Policy
- Section 5 presents the Policy's main conclusions.

1.2 National Context

Namibia's national development ambitions are guided by the Vision 2030 document that was adopted in 2004 and which presumes secure and affordable energy provided to the country's developing economy and its people. Vision 2030 provides the overall long-term development goals for the country, and it subscribes to the principle of sustainable development. Specifically, Vision 2030 foresees **"a prosperous and industrialised Namibia, developed by her human resources, enjoying peace, harmony and political stability."**

Government's medium-term goals and strategies are expressed in National Development Plans (NDPs), which are revised every five years, and they are formulated in keeping with Vision 2030. 2016/17 sees NDP4 in the last year of its term, and the formulation of NDP5 has already commenced. Regarding energy-related developments, the national development framework described above has the following implications:

1. An industrialised Namibia, as envisaged by Vision 2030, can only be realised provided secure, sufficient and economically priced energy supplies are, and remain, available for domestic, commercial and industrial use. This ambition has clear repercussions for the country's energy industry and it necessitates secure, timely and cost-effective delivery to support national development.
2. Economic and social upliftment of the people of Namibia intrinsically includes access to modern energy, at fair and affordable prices. Without such access, the people of Namibia cannot realise their personal development ambitions. Again, it is the country's energy industry that must ensure that the energy resources are available to power the nation and her people.

In 2016, the President of the Republic of Namibia released the Harambee Prosperity Plan (HPP) that spells out Namibia's short-term development priorities, including specific short-term targets for the energy industry which this Policy aligns with. In addition, Namibia ratified its contributions to the Paris Climate Agreement, as codified in the intended nationally determined contributions (INDCs) to the UNFCCC. Namibia's INDCs commit the country to increase the share of renewables in electricity production to 70%, to increase energy efficiency and demand side management measures (DSM), to implement mass transport in Windhoek, and to introduce car and freight pooling.

In keeping with Vision 2030, this National Energy Policy has been developed within the overall framework of sustainable development, in that social, economic, and environmental considerations jointly set the overall direction and determine the targets for Namibia's long-term energy-related development aspirations.

1.3 Economic and Social Context of this Energy Policy

Economic and social challenges persist in Namibia that have profound implications for the country's energy industry. In 2016, Namibia's population comprised some 2.3 million people, occupying an area of some 824 292 km². This implies a population density of some 2.8 people per km², which remains one of the lowest in the world. One-half of the country's population resides in urban and peri-urban centres, the remainder are rural. Rural-to-urban migration is considerable, driven in parts of rural Namibia by a lack of opportunities and services. The unemployment rate remains above 25%, and the country's GINI coefficient, which is a measure of the inequality in the distribution of incomes, remains high at just below 0.6.

In 2015, Namibia's GDP per capita was USD11 400. In terms of its Human Development Index, as determined by the United Nations, Namibia is ranked 126th in the world, which implies that it is ranked as a 'medium human development' country.

The above indicators reveal that considerable economic and social challenges persist. These challenges have profound implications for the country's energy industry, especially in terms of service delivery and cost expectations, and the need for urgent investments and growth.

Namibia's energy consumption is likely to increase considerably if its industrialization goals are to be realized. According to IEA statistics based on 2013 data, Namibia's per capita energy consumption in kg oil equivalent was 742kg. In comparison, South Africa's consumption was 2 656kg, Botswana's

1 098kg and Germany's 3 868kg. These figures provide a rough indication of Namibia's relative low level of industrialisation, and they give a glimpse of by how much energy consumption is likely to increase if the national goal of industrialisation is realised.

1.4 Overview of Namibia's Energy Sector

Namibia's energy sector comprises formalised electricity, upstream oil and gas, downstream liquid fuels subsectors, as well as the less formalised downstream gas and thermal energy subsectors. In the past, renewable energy has been regarded by many as a separate subsector. However, this Policy integrates these sectors into the electricity and thermal subsectors, as per their specific roles.

Over the past two decades, the country's electricity sector has undergone numerous important developments and changes. The sector has a well-developed regulatory framework that is operationalized by the Electricity Control Board. NamPower owns and operates some 11 561km of transmission network, which connects various regional markets to Namibia, and facilitates the active trade of electricity. In addition, NamPower has added some 120MW of national electricity generating capacity, bringing the total installed capacity to 493MW. Several Independent Power Producers (IPPs) have commenced operations recently, and more are due to commence operations in the very near future. By 2017, it is expected that some 40% of the daytime electricity demand could be served by renewable energy sources. The National Integrated Resource Plan (NIRP) of 2016 envisages that in the order of 300MW of additional base-load capacity is to be added within the next five years.

Over the past decade, some 59% of electricity supplied in Namibia has had to be imported. This is not in keeping with the White Paper on Energy Policy's target, which stipulated that some 75% of electrical energy and 100% of peak electricity demand was to be supplied from local resources. Overall, in 2014, Namibia imported some 73% of its total energy requirements, and some 92% of commercial forms of energy (all except energy derived from biomass), thus exposing the country to the risk of import dependency.

As indigenous energy resources, renewable energy in the form of solar, wind and biomass (specifically encroacher bush) are available in abundance. Increasingly, they find their way into the mainstream grid-bound electricity sector, as well as the thermal energy sector of the country. In addition, numerous off-grid applications are well-suited for the increased application and use of renewables. The integration of intermittent renewable sources into the electricity grid requires further attention to address the associated technical and operational challenges. Once resolved, the increased uptake of renewables is considered likely, which would contribute to the country's energy security and diversify its energy mix.

The petroleum sector comprises three subsectors, namely, upstream (exploration and production), midstream (storage, refining and transportation), and downstream (supply and distribution). In this Policy, midstream and downstream operations are dealt with jointly.

Namibia has an active upstream oil and gas exploration sector. Over the past 15 years, numerous licenses have been issued, and significant geological data and information has been collected. However, so far, the only commercially exploitable find has been the Kudu Gas Field off Namibia's southern coast.

The downstream liquid fuels sector imports all fuel products used in Namibia. To improve security of supply and reduce reliance on private oil companies, Government is currently in the process of constructing the first national strategic liquid fuels storage facility, with a capacity of 73 000m³ at the new port in Walvis Bay.

Several global geopolitical issues have affected international oil prices, causing price volatility. These include the increased global demand for petroleum products, unrest in the Middle East countries, reduction in production by OPEC, foreign exchange fluctuations, fluctuations in the USA strategic reserves, and, more recently, the production of oil from oil shale in the USA.

Although high international oil prices and a weak Namibian Dollar with regards to hard currency have led to spikes in prices of petroleum products in the domestic market creating inflationary pressure on prices of commodities, high prices enhance project economics and monetization of oil and gas fields that would otherwise have been ranked economically unviable at lower price thresholds. They also improve liquidity of exploration companies, thus increasing their risk appetite. It is worth noting that it was during a period of high prices when exploration activities in Namibia soared.

Presently, however, the world has witnessed a marked drop in crude oil prices, spurred mainly by the production of oil from oil shale in the USA and coupled by the refusal of OPEC to reduce production to buoy prices of crude oil by limiting supply. This has provided relief to motorists, and it is expected to also impact the prices of commodities positively, especially in oil importing countries such as Namibia. The shortcoming is that low oil prices render oil and gas exploration and monetization less attractive.

Imported petroleum products are paid for in US Dollars. The depreciation of the Namibian Dollar against the US Dollar negates any drop in international crude oil prices and renders imports more expensive.

In terms of consumption, Namibia's energy sector is dominated by liquid fuels, which accounted for some 58% of all energy consumed in Namibia in 2014. Electricity accounted for some 20%, and biomass for another 20%, as depicted in Figure 2.

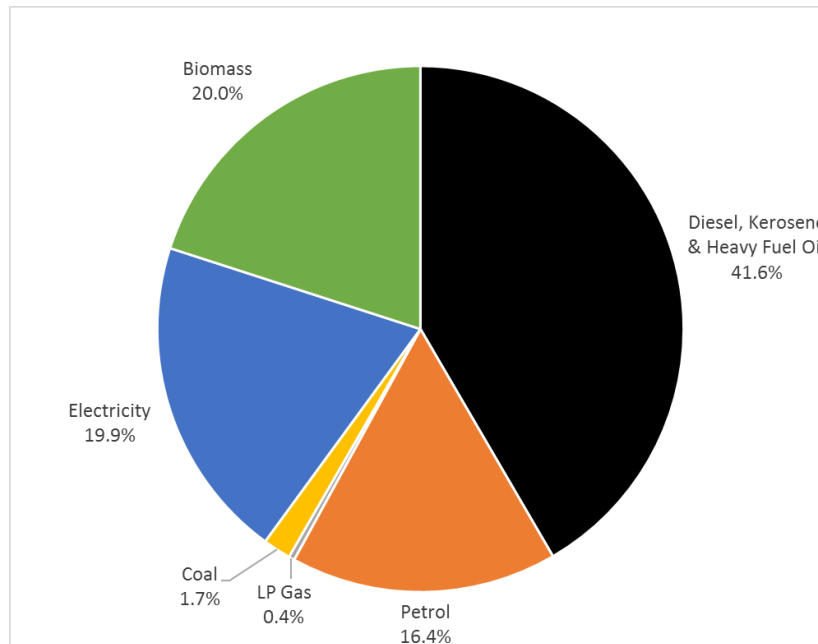


Figure 2: Energy Consumption by Type in 2014

For the past decade, attention in the energy sector has focussed mostly on the electricity and upstream oil and gas sectors. Despite this, Namibia remains fully dependent on liquid fuel imports, while also importing a sizeable proportion of its electricity requirements. The country continues to have little influence over the price of these energy imports. In contrast to the electricity and upstream

oil and gas sectors, the local biomass sector has had little attention devoted to it, despite its immediate relevance as the main household fuel source for most Namibians.

Throughout the past decade, the country's overall energy consumption has grown by some 3% per annum, while electricity consumption has increased by an average annual rate of some 4.1%. During the last five years, the Namibian economy has grown by an average of 5.5% per annum.

Figure 3 depicts the ten-year trend in energy consumption per energy type for Namibia.

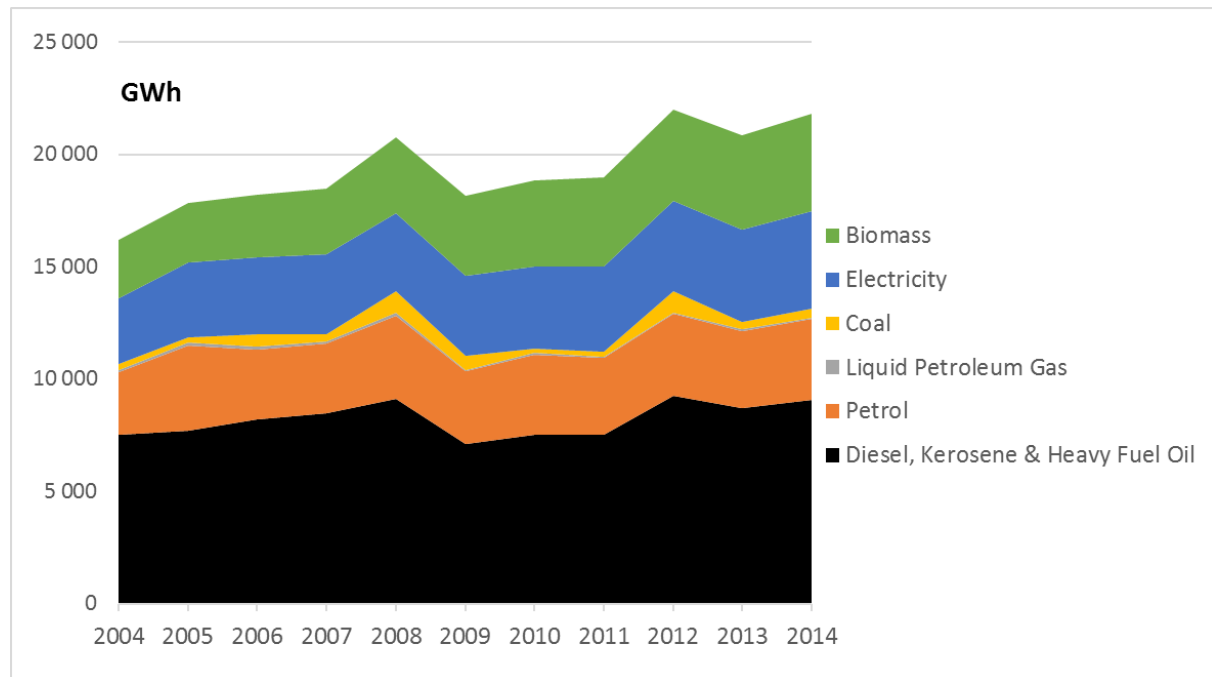


Figure 3: Development of Energy Consumption by Type for Namibia

1.5 Key Indigenous Energy Resources

Namibia is abundantly endowed with a variety of indigenous energy resources. The following are dealt with in further detail in this document:

- **Natural gas:** The Kudu Gas Field, which was discovered in 1974, has proven reserves that are commercially exploitable. Work is continuing to commercially develop this resource.
- **Biomass:** More than half of all households in Namibia use wood as an energy source for cooking and heating, making biomass a major energy resource. Biomass also has significant potential for further commercial utilisation.
- **Hydro potential:** In 2016, hydropower was the dominant local electricity generation source. Further hydropower potentials exist for the Kunene River, as well as for other rivers on the country's borders.
- **Solar potential:** Namibia has one of the best solar irradiation regimes in the world, suitable for both solar electricity generation and solar thermal applications. Commercial use of this resource is increasing rapidly.

- **Wind potential:** Situated mostly along the country's coastline, Namibia has significant wind potential areas which are useful for electricity generation. Commercial use of this resource is envisaged to commence soon.
- **Uranium:** Namibia is one of the world's largest uranium producers. If current uranium exports are expressed in terms of their energy potential, then Namibia is a net energy exporter. Local use of this resource for power generation has not yet been realised.
- **Coal:** Although coal deposits have been found in Namibia, they are not considered commercially viable for exploitation.
- **Waste:** Namibia has municipal and other sources of waste that could potentially be utilised for electricity generation. Further development work in this area is needed.
- **Geothermal:** Namibia's geothermal potential has not yet been confirmed and awaits to be quantified and developed.
- **Ocean and wave energy potential:** Namibia has a long coastline which offers the likely potential to harvest energy from the ocean. This potential, however, also awaits further quantification and development.

1.6 Key Energy Sector Institutions

1.6.1 Ministry of Mines and Energy (MME)

The Ministry of Mines and Energy (MME) is the ministry responsible for energy matters in the country, and it is the custodian of the National Energy Policy. The Ministry's mandate, as expressed in the MME's strategic plan for 2012-2017, states that

"The Ministry of Mines and Energy was constitutionally established to take custody of Namibia's rich endowment of mineral and energy resources and create an environment in which the mineral, energy, and geological resources contribute to the country's socio-economic development."

The Ministry's mission statement affirms that the MME is

"To promote, facilitate, regulate and monitor the responsible development and sustainable utilisation of Namibia's mineral, geological and energy resources; through competent staff, innovation, research, and stakeholder collaboration in a conducive environment for the benefit of all Namibians."

Among others, the MME is responsible for the following:

- Developing policies and undertaking planning to ensure national energy security
- Approval of licenses under the Electricity Act
- Rural electrification planning, funding and implementation
- Planning for sufficient electricity generation capacity to meet demand
- Defining procurement and off-take responsibilities for new generation projects
- Administration of the solar revolving fund
- Issuance of licenses for petroleum exploration and production
- Regulation of petroleum product prices and the equalisation of petroleum product prices
- Export and import control of petroleum products.

1.6.2 Electricity Control Board (ECB)

The ECB is the statutory regulator for the electricity sector, established in 2000 under the Electricity Act of 2000. It is funded by the ECB levy which is imposed on electricity consumption. The Electricity Act was replaced by an updated Act in 2007.

The ECB currently regulates the technical and economic aspects of the electricity sector. It administers licensing of sector activities and makes recommendations to the Minister regarding issuance of licenses (licenses are approved by the Minister, not the ECB).

1.6.3 NAMCOR

The National Petroleum Corporation of Namibia (NAMCOR) is a legally enacted entity with limited liability under the Namibian Companies Act of 1973. Government is its sole shareholder. Under the Petroleum (Exploration and Production) Act of 1991, NAMCOR has the right to carry out reconnaissance, exploration, and production operations either on its own, or in partnership with other organisations in the industry. NAMCOR's upstream activities include exploration, production, promotion, and maintaining a technical advisory role to the Ministry of Mines and Energy.

In line with the Corporation's strategy of building an integrated oil company, NAMCOR operates in the petroleum downstream sector by participating in fuel supply tenders and targeting customers in the business to business (commercial) sectors. In addition, NAMCOR has constructed several fuel depots around the country, and is in the process of becoming active in the fuel retail market.

1.6.4 NamPower

The Namibia Power Corporation (NamPower) is the country's major state-owned power utility. It is registered as a proprietary limited company under the Companies Act, with government as its sole shareholder.

NamPower is responsible for generation, transmission, trading, and import and export of electricity. NamPower currently owns and operates the major power stations in the country as well as the transmission grid. NamPower is also involved in distribution of electricity, however, its activity in this sector is limited and the intention is for NamPower to withdraw operationally from this sector.

NamPower currently fulfils the role of single buyer of electricity, and it is also the country's system and market operator. As such, NamPower is the buyer of electricity under the Interim REFIT programme, as well as other IPPs. Although NamPower is generally regarded as the 'supplier of last resort', this is not formally or legally anchored.

1.6.5 National Planning Commission (NPC)

The mandate of the National Planning Commission (NPC) is derived from Article 129 of the Constitution of the Republic of Namibia, as well as the National Planning Commission Act 2013 (Act 2 of 2013). The NPC is to "plan and spearhead the course of national development."

Specifically, the functions of the NPC are:

- Identifying Namibia's socio-economic development priorities
- Formulating short-term, medium-term and long-term national development plans in consultation with regional councils

- Developing monitoring and evaluation mechanisms to ensure effective implementation of the national development plans
- Evaluating the effectiveness of Government's socio-economic policies
- Coordinating the development of Government socio-economic policies to ensure consistency
- Mobilising, managing, and coordinating international development cooperation.

1.6.6 National Energy Council (NEC)

The National Energy Council (NEC) is established under the Petroleum Products and Energy Act of 1990 (as amended), and derives its mandate from the Act. Its objects are: a) to advise the Minister on matters concerning the supply of energy in Namibia, and the development, exploitation, and utilisation of energy resources in Namibia, and b) to assist the Minister to co-ordinate and rationalise activities connected with the energy industry in Namibia.

The NEC has an advisory role vis-à-vis the Minister, although it is noted that it generally limits its main activities to the petroleum space.

1.6.7 Namibia Energy Institute (NEI)

The Namibia Energy Institute (NEI) is a national institute of Government, and is housed at the Namibia University of Science and Technology (NUST).

Its mission is to undertake research, development, enhancement of energy policy and regulatory frameworks, stakeholder engagement, and project implementation on behalf of the MME. The NEI seeks to build Namibia's capacity in the field of energy, including energy efficiency and different energy technologies, with an aim to contribute to Namibia's industrialisation by linking energy research, technology, policy, and education to the needs of industry, in support of national socio-economic development imperatives, initiatives and programmes. The NEI achieves its mission with targeted interventions through its four centres, i.e. the Centre for Renewable Energy and Energy Efficiency, Centre for Electricity Supply, Centre for Petroleum (Oil and Gas), and the Centre for Nuclear Sciences.

1.7 Key Energy Sector Developments

This section highlights some of the more prominent developments that have taken place in the energy sector since Namibia's independence in 1990.

1.7.1 Electricity Sector

The following are considered key developments in the country's **electricity sector**:

- Shortly after independence, Government commenced with an ambitious **rural electrification programme**. Considerable progress has since been made in this field. In addition to the original **Rural Electricity Distribution Master Plan** of 2000, two updates were commissioned, thus providing an unambiguous prioritisation and planning framework for rural grid electrification. In addition, an **Off-Grid Energisation Master Plan** was developed in 2007, which provides a preliminary framework for off-grid electrification. Despite these plans, access to energy, particularly in many of the country's rural areas, remains low, and the topic of providing increased access to modern energy such as electricity is, and remains, a national priority.
- The **White Paper on Energy Policy** was published in 1998 and ever since, it has served as the country's official energy policy.
- The promulgation of the **Electricity Act of 2000**, and its successor in 2007, has created and given form to the Electricity Control Board (ECB), and has since led to the establishment of the regulatory provisions which are used to govern the country's electricity sector.
- **Three separate Regional Electricity Distributor (RED) companies** have been established, all of which are currently operational.
- In 2006, the **Renewable Energy and Energy Efficiency Institute (REEEI)** was established, and in 2014, it was transformed into the **Namibia Energy Institute (NEI)**.
- NamPower's **Anixas power plant** was inaugurated at the end of 2011. In April 2012, a **fourth turbine was installed at the Ruacana hydropower station**. In 2016, the **Van Eck coal-fired power station north of Windhoek was refurbished**.
- A **National Integrated Resource Plan (NIRP)** was first drafted in 2013, and reviewed in 2016. The NIRP provides an agreed electricity demand and supply scenario for the Namibian electricity supply industry (ESI).
- In 2015, the **first utility-scale commercial solar PV plant** with 4.5MWp installed capacity was connected to the Omburu substation in Omaruru. In 2016, three operational solar PV plants were installed, and more are being added at a rapid pace.
- Between 2016 and 2017, 14 projects are expected to become operational, to add some **70MW of solar PV and wind power** under the Interim REFIT programme.
- The **single buyer electricity market model** was adopted by Cabinet in 2000. In 2016, this model is considered out-dated.
- During the period of 2009 to 2015, when many countries in the region experienced extensive load-shedding, **NamPower avoided load-shedding in Namibia**.
- The **Electricity Bill of 2016** introduces various improvements to the legal framework for the electricity industry, and lays the groundwork for an updated market model.

- The **Energy Regulatory Bill of 2016** lays the groundwork for transforming the ECB into the National Energy Regulatory Authority.
- Government's **Solar Revolving Fund (SRF)** has assisted consumers with funding renewable energy technologies, both solar PV and solar thermal.
- **Regional integration, co-operation and interconnection** have been boosted by the construction of the 400kV interconnector to South Africa, as well as the HVDC link to Zambia. Through NamPower, Namibia is actively participating in SAPP. In this regard, the goals expressed in the WPEP can be considered as having been largely achieved.
- In 2015, the ECB developed **net metering rules** which provide a framework for consumers to install small-scale grid-connected renewable energy generation facilities, thereby operationalizing a key support mechanism for the wide-spread participation of small-scale privately-owned actors in the country's energy market.
- In 2016, the **Renewable Energy Policy** was developed, and remains to be promulgated.
- In 2016, the **Independent Power Producer Policy** was developed, and remains to be promulgated.

The above illustrates that the past two decades have seen considerable progress regarding the establishment of both institutional and regulatory provisions in the country's electricity sector.

1.7.2 Petroleum Sector

The following are considered key developments in the country's **petroleum sector**:

- The development and promulgation of the **petroleum sector legislation**, notably the 1990 Petroleum Products and Energy Act, and the 1991 Petroleum (Exploration and Production) Act, has laid the framework for the commencement of petroleum development activities in the country.
- In the early 1990s, Namibia made use of a **bidding system for oil and gas exploration licenses**. However, in 1999, the country adopted an open licensing system that led to an increase of exploration activities from 2008 to date, which has resulted in the undertaking of both 2D and 3D seismic surveys, and 7 offshore exploration wells being drilled.
- Namibia's active promotion of its hydrocarbon potential has resulted in the attraction of international oil companies, including Shell, BP and Tullow Oil. In 2013, the Wingat-1 well proved the **presence of an active petroleum system capable of generating both oil and gas**.
- Despite considerable efforts, exploration activities have not yet resulted in any commercially viable finds, except for the Kudu Gas Field, which was discovered in 1974.
- In October 2005, the MME issued **Production Licence No.001** to Energy Africa Kudu Limited (90%) and NAMCOR (10%) for the development of the Kudu Gas Field.
- In October 2009, the MME issued **Production Licence No.002** to the Gazprom EP International B.V./NAMCOR joint venture (54%), Tullow Kudu Limited (31%), and CIECO E&P (Namibia) Co. Ltd. (15%) for the development of the Kudu Gas Field.
- In August 2015, the MME approved an amendment to **Production Licence No.003**, granting NAMCOR 100% participating interest in the licence for the development and operation of the Kudu Gas Field.

- In September 2015, Cabinet made a resolution providing credit support to the Kudu Gas-to-Power project.
- Over the past two years, the **global oil and gas industry has been severely affected by low oil prices**, which have significantly reduced exploration investments, especially in frontier countries such as Namibia. This is compounded by the fact that there have been no commercial discoveries in Namibia other than the Kudu Gas Field.
- **Namibia still imports all its petroleum and gas requirements.** Until local exploitable reserves are discovered and associated downstream processing and storage facilities are established, the status quo will remain, and the associated risks must be managed as best as possible.
- In 2015, Government commissioned the establishment of the **national strategic liquid fuels storage facilities in Walvis Bay** to contribute to the security of supply. Once completed, the total fuel storage capacity will increase from 15 days to 75 days.
- In terms of **regional integration, a bilateral gas agreement was signed with South Africa in 2003**, principally in support of the development of the Kudu Gas Field.
- On the **downstream petroleum pricing side, government continues to regulate prices**, and through the National Energy Fund, has implemented measures to even out price fluctuations, and to ensure that rural prices are buffered against high distribution costs.
- **Training and capacity building of Namibians through the PETROFUND** is on-going, and both the University of Namibia (UNAM) and Namibia University of Science and Technology (NUST) have introduced courses relevant to the oil and gas fraternity.

For the upstream petroleum and gas sector, an effective regulatory structure was put in place by the MME, and supported by NAMCOR. In addition, a successful licensing system was established, which attracted interest in most offshore areas. Also, a sizable geological database was set up by the MME and NAMCOR. However, some of the ambitions and aspirations expressed in the White Paper on Energy Policy of 1998 have not materialised, as no new exploitable reserves have been identified. The challenges in the upstream oil and gas sectors include attracting and retaining investments that result in exploration activities that achieving a first commercial discovery, and increasing local content and local participation throughout the industry.

As for the downstream side, this sector has not fundamentally changed, apart from the participatory role of NAMCOR. Therefore, most of the policy statements as contained in the White Paper on Energy Policy of 1998 remain as relevant today as they were in 1998.

1.7.3 Other Developments

The following key developments have taken place in **other energy-related sectors**:

- As a SADC member, Namibia has adopted the SADC Protocol on Energy. SADC has enacted several strategic plans for energy development in the region, including the SADC Energy Cooperation Policy and Strategy in 1996, the SADC Energy Action Plan in 1997, the SADC Energy Activity Plan in 2000, and, most recently, the Regional Infrastructure Development Master Plan and Energy Sector Plan in 2012. In general, these development strategies focus on the infrastructure developments in the SADC member states' energy sectors, which include liquid petroleum fuel, natural gas, electricity, coal, renewable energy, as well as energy efficiency and conservation. Although implementation of these

strategies has been slow, the region has made significant strides, particularly in the electricity sector.

- In the past decade, several **national programmes targeting the uptake of renewable energy and energy efficient technologies** were undertaken. Amongst others, these included the NAMREP and REEECAP programmes, implemented between 2004 and 2008, which focused on the identification and removal of technical, financial and regulatory barriers.
- In 2006, the **Renewable Energy and Energy Efficiency Institute (REEEI)** was launched as an initiative between the Ministry of Mines and Energy and the Polytechnic of Namibia. In 2014, REEEI was transformed into the **Namibia Energy Institute (NEI)**, which is housed with the **Namibia University for Science and Technology (NUST)**.
- More recently, the UNDP-supported CSP TT NAM programme (Concentrating Solar Power Technology Transfer for Electricity Generation in Namibia) was launched in 2014. On completion in 2017, it is envisaged that the programme will have **laid the foundation for the introduction of concentrating solar power technologies**.
- Namibia is **well-endowed with biomass resources**, mainly in the form of encroacher bush. An active charcoal industry has developed, utilising both invasive and other tree species. The CBEND encroacher bush-to-power project was developed as a demonstration plant, however, up until now, without operational success. Various other efforts have and continue being made to harvest and utilise encroacher bush commercially, such as at the Ohorongo Cement Factory and Namibia Breweries who co-fire thermal processes.
- Preliminary, and mostly uncoordinated, efforts were made to introduce **fuel-efficient wood stoves and solar cookers**. It remains inconclusive whether such endeavours have contributed to reaching the envisaged adoption levels, or whether they have been fully embraced by end-users.
- Various national and local **energy efficiency and demand side management projects** were initiated over the past years. Amongst others, the **CFL (2007) and LED (2016) lighting campaigns** were undertaken by NamPower; the Green Building Council was established; and the implementation of the Namibia Energy Efficiency Programme in Buildings (NEEP), and the Southern African Solar Thermal Training and Demonstration Initiative (SOLTRAIN) were undertaken by the Namibia Energy Institute.
- Namibia remains one of the world's main producers of **uranium concentrate**. However, few legal and regulatory provisions are currently in place to derive greater value from this strategic energy resource.

Figure 4 depicts a timeline of the main developments that have shaped the Namibian energy sector since the country's independence.

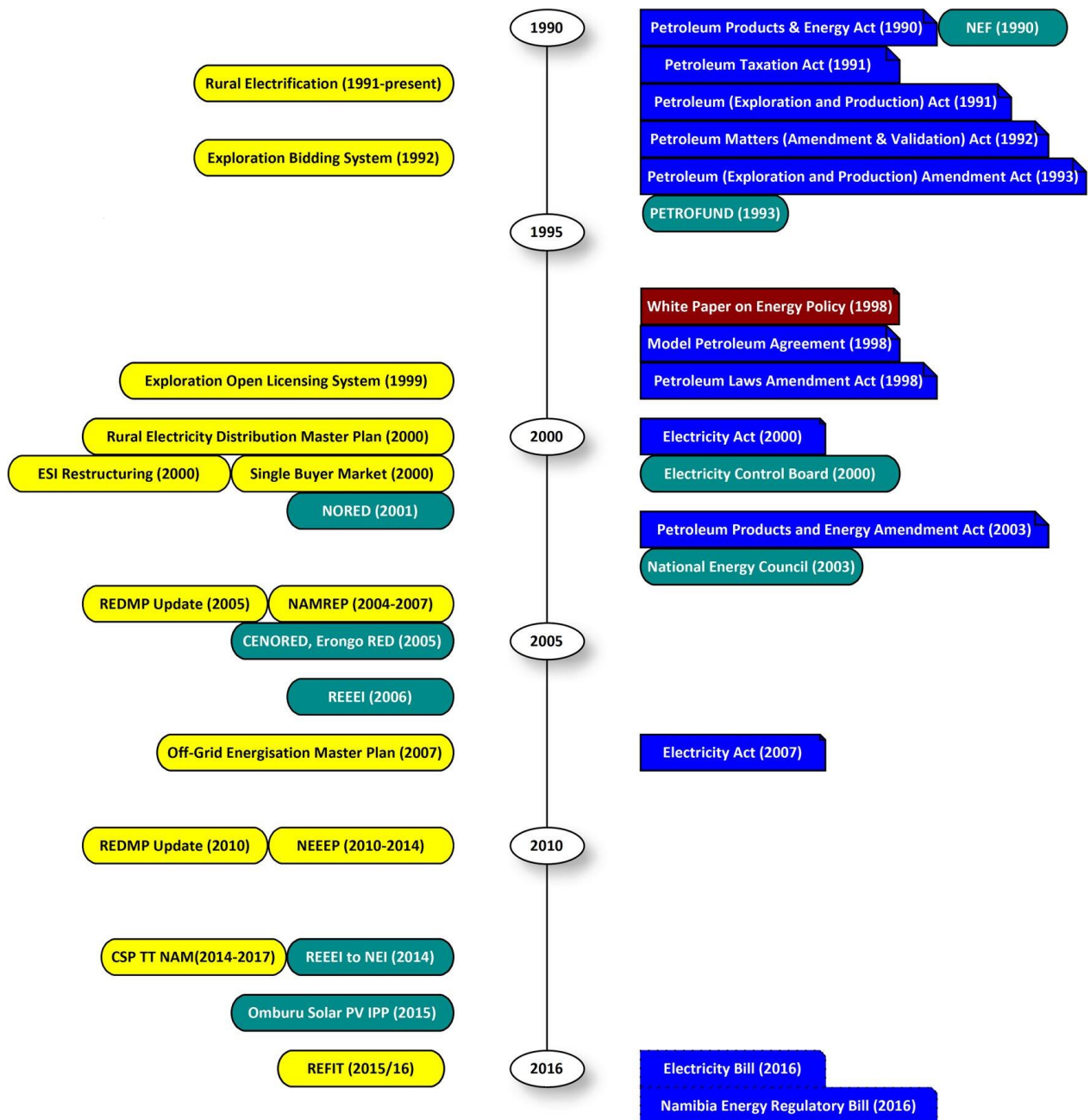


Figure 4: Timeline of the Major Energy-related Developments in Namibia

The energy sector developments shown in the timeline in Figure 4 illustrate that the adoption of the White Paper on Energy Policy in 1998 gave rise to a period of inspired activity in the energy industry. The first momentum lasted some ten years, and even though it seems to have reduced thereafter, some progress has since continued. Based on this observation, it is the intention and deliberate ambition of Government that the development and adoption of this National Energy Policy similarly energises a second prolonged period of active development throughout the industry, actively contributes to the development of Namibia, and attains its development goals.

2 Policy Framework

2.1 Guiding Principles

The National Energy Policy is an expression of Government's vision of the future of the country's energy sector. In this regard, the Policy aims to *"ensure the development of Namibia's natural capital and its sustainable use for the benefit of the country's social, economic and environmental wellbeing."*

The Policy communicates the country's energy-related strategic intent, and Government's position on national energy matters. As such, it attempts to strike a balance between ambitions and the all-important focus on the future, while at the same time being tangible, specific and guided by realism. The Policy is the roadmap for the development of Namibia's energy sector, providing high-level descriptions of the various energy and energy-related services which are to contribute to the country's development.

The National Energy Policy endeavours to be cognisant of the critical importance of the development of the country's energy sector placing focus on the discovery, development and beneficial use of Namibia's plentiful indigenous energy resources.

While energy is an essential prerequisite for socio-economic development, it is not the only critical dimension of importance to Government. Rather, the Policy recognises energy and its diverse strategic, national and societal roles as principal ingredients necessary for national development and social upliftment. It is for this reason that the Policy aims to take a holistic view that aligns with development goals, priorities and targets expressed in the multitude of other national policies.

At the same time, Namibia is party to several important international and regional agreements and obligations that require national commitments and actions. The Policy is cognisant of Namibia's diverse commitments and obligations and recognises them as opportunities for development. The Policy endeavours to focus national energy-related needs and ambitions by leveraging Namibia's important competitive and comparative advantages, while also benefitting from its various regional and international partnerships, agreements and commitments.

2.2 Sustainable Development

Spearheaded by the United Nations, the Sustainable Development Goals (SDGs) express the intergovernmental goals and aspirations to end poverty, protect the planet, and ensure prosperity for all. Today, the SDGs are an expression of the international sustainable development agenda which, in turn, has important repercussions and implications for Namibia.

With regards to energy, Goal 7 of the SDGs recognises that *"energy is central to nearly every major challenge and opportunity the world faces today. Be it for jobs, security, climate change, food production or increasing incomes, access to energy for all is essential."* Based on this, SDG Goal 7 expresses the vision that the international community is to strive to *"ensure access to affordable, reliable, sustainable and modern energy for all."*

As the National Energy Policy acknowledges the relevance and importance of the SDGs addressing the critical topics of the time, it has therefore adopted and incorporated the underlying philosophy of these SDGs. This is specifically expressed in the National Energy Policy's overarching objective, which states that the country's energy sector initiatives and activities are to contribute to the sustainable development of Namibia, noting that it is development that meets the needs of the present without

compromising the ability of future generations to meet their own needs. It is in this spirit that the National Energy Policy's imperatives are to be understood and applied.

Sustainable development, supported by the social, economic and environmental pillars, is the foundation of the National Energy Policy. In practice, and to be recognised as an agent of social advancement, energy must therefore contribute to the improvement of the lives and livelihoods of Namibia's people. Energy must also support the industrialisation of Namibia, and promote local content and local participation to satisfy the Policy's economic requirements. With regards to environmental criteria, the use of energy resources and energy consumption must ensure that the environment and its multitude of services remain intact. The success of the Policy and its implementation will be measured by the extent of its contribution to Namibia's sustainable development.

2.3 Policy Direction

The overall direction of the National Energy Policy is expressed in the Policy's vision and mission, and in its goals and strategies. A schematic depiction of the main foundations of Namibia's National Energy Policy is shown in Figure 5.

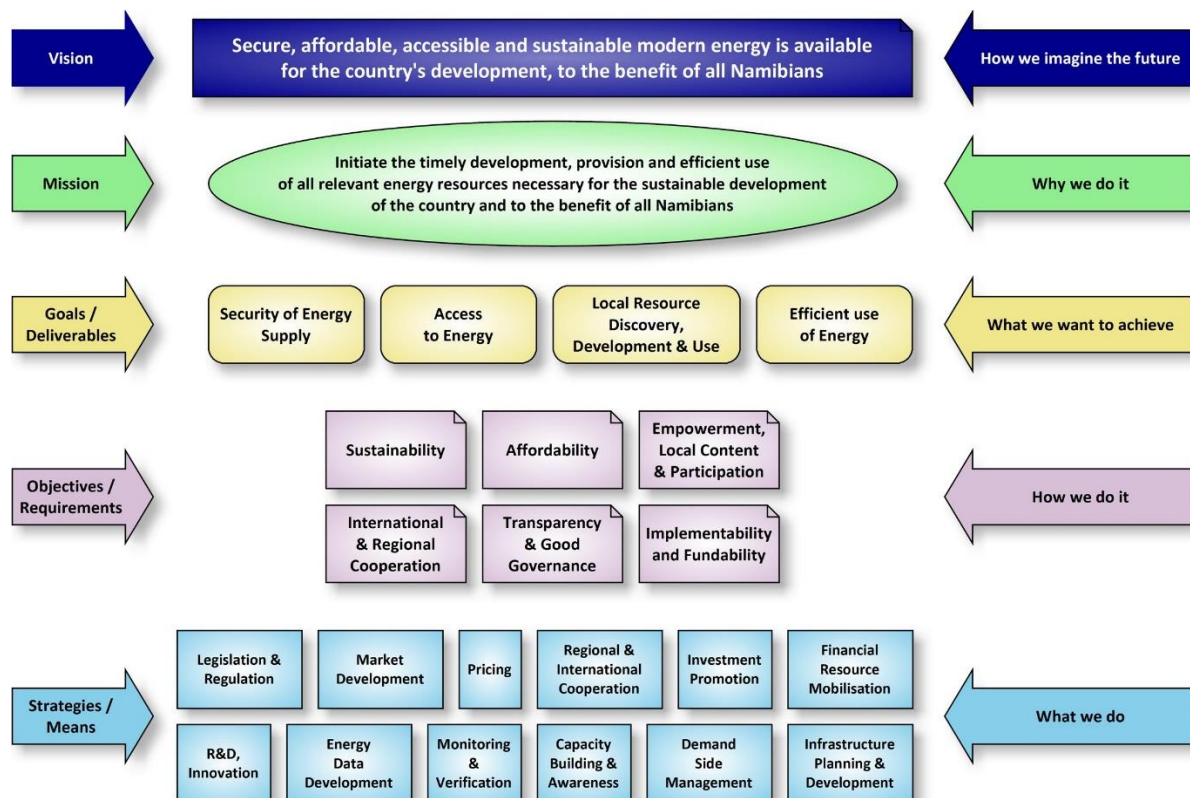


Figure 5: Framework underpinning Namibia's National Energy Policy

2.3.1 Vision

The vision of the National Energy Policy is a summary statement that captures the Policy's overall ambition and intent. It frames the country's energy future in a way that is both easy to understand and visualise, and it seeks to convey a picture that motivates the people of Namibia to provide support during its realisation.

The National Energy Policy envisions a future in which secure, affordable, accessible and sustainable modern energy is available for the country's development, to the benefit of all Namibians.

2.3.2 Mission

The mission of the National Energy Policy expresses the Policy's ultimate rationale, and it provides a sense of the Policy's overall direction through the reason for why it exists.

The National Energy Policy's mission is to initiate the timely development, provision and efficient use of all relevant energy resources necessary for the sustainable development of the country, to the benefit of the present and future generations of Namibians.

2.3.3 Goals

The goals of the National Energy Policy summarise the Policy's main deliverables. In other words, the goals provide the answer to what the Policy intends to achieve.

The National Energy Policy's main goals are to:

- ensure the security of all relevant energy supplies to the country
- create cost-effective, affordable, reliable and equitable access to energy for all Namibians
- promote the efficient use of all forms of energy
- incentivise the discovery, development and productive use of the country's diverse energy resources.

2.4 Prerequisites

The National Energy Policy requires that all energy actors follow best-practice health and safety provisions in all energy-related projects and undertakings, and that they remain compliant with the relevant legal and regulatory provisions.

2.5 Objectives

The objectives of the National Energy Policy summarise the requirements that are to guide the implementation of the Policy.

In reference to the three pillars of sustainable development (the social, economic and environmental dimensions), the National Energy Policy needs to answer three overarching questions:

- Does the Policy improve the lives and livelihoods of the people of Namibia?
- Does the Policy support and drive Namibia's economic advancement?
- Does the Policy protect the environment and allow for vital ecosystem services to remain available for the benefit of future generations?

Consequently, to be regarded as contributing to the sustainable development of Namibia, the National Energy Policy's overarching objective is that energy sector activities provide positive answers to the above questions.

The National Energy Policy's objectives are that

- all energy-related activities ensure that the environment is protected and resources are used in a sustainable manner
- affordability is recognised as a key determinant in ensuring that availability of and access to modern energy supplies is meaningful to individuals and industry alike
- opportunities are systematically created to increase the share of local content providers throughout the Namibian energy industry, local participation is actively promoted across the sector's multiple value chains, and broad-based economic empowerment is integrated into the planning approaches and structures of the country's energy industry
- both regional and international commitments are considered and actively support the development of the country's energy industry
- ambitious realism is practiced by ensuring that energy projects can attract the necessary funding and that they are implementable
- transparency and good governance are practiced in all energy-related regulatory processes, market operations and project developments.

2.6 Strategies

The strategies of the National Energy Policy identify how the Policy will be implemented, thereby being an expression of the Policy's overall game plan. These strategies are to be implemented in alignment with Government's overall goals, as well as within the framework provided by related policies.

The National Energy Policy's strategies are based on the following elements:

- a comprehensive, fair and transparent set of sector-wide regulations enforced by the relevant regulatory authority
- a set of programmes for the planned development of the national energy market
- the introduction and use of active pricing regulation for all energy-related products
- the active promotion of regional cooperation to strengthen the security, reliability and cost-effectiveness of all cross-border energy trading activities
- an integrated approach to the promotion of investment and development opportunities throughout Namibia's entire energy sector
- the mobilisation of financial resources to promote investments across Namibia's energy sector
- the creation of support and funding opportunities to promote innovation, as well as research and development throughout the country's energy sector
- the creation and maintenance of a Government-funded energy data and information custodian that is tasked to collect, collate and make available energy-related data and information on a continuous basis

- the creation of systematic approaches to monitor all energy-related projects with a view to verifying and optimising the benefits of publicly funded projects
- the creation and on-going support of training and capacity development across the various energy sectors, as well as the support of relevant awareness-raising initiatives
- the active promotion and regulation of demand side management measures, as well as energy efficiency approaches across the different elements of the energy sector's value chains
- the support of the planning and development of energy infrastructure to serve the needs of the nation.

3 Policy Issues and Policy Statements

This section presents the main policy issues, and associated policy statements. These are presented per major energy sector, where each includes a brief introduction and discussion of the main overarching issues and topics. Each sector is divided into various sub-sections, wherein sector-specific aspects and ancillary topics are addressed. Each main section commences with the identification of the main policy objective, and then provides policy statements which spell out the Government's intent. To ensure transparency and easy referencing, all policy statements are numbered.

It is important to note that the sequence in which the various energy sectors are addressed does not reflect their relative importance in this Policy.

3.1 Electricity Sector

3.1.1 Introduction

The Namibian electricity sector serves some 230 000 grid-connected customers. In 2016, the country recorded a system peak demand of 608MW, and NamPower sold some 3.3TWh of electrical energy in Namibia. In the same year, the total installed generation capacity, as reported by NamPower, amounted to 493MW, excluding IPPs and customer-installed and embedded generation facilities.

3.1.1.1 Structure of the Electricity Sector

The Namibian electricity sector has a well-developed institutional structure which is governed by established regulatory processes and procedures. Since 2000, the Electricity Control Board (ECB) regulates all activities in the sector under the authority of the Electricity Act of 2000 (replaced by the Electricity Act of 2007), however, licences are approved by the Minister of Mines and Energy and not the ECB.

The main operating entities are NamPower (responsible for generation, transmission, import, export, trading, and being engaged in distribution and supply), the Regional Electricity Distributors and various other distributors (responsible for distribution and supply to end-consumers), as well as several independent power producers, whose numbers are growing fast. Figure 6 illustrates the sector's structure.

The roles and responsibilities of the country's Electricity Supply Industry (ESI) actors are well-defined. The industry is governed by the Ministry of Mines and Energy as its policymaker. The ESI is regulated by the ECB, as mandated in the Electricity Act, Act 4 of 2007. Participants in the industry are required to obtain licenses which are approved by the Minister of Mines and Energy, and issued by the ECB. Licenses are differentiated according to activities.

The Minister of Mines and Energy is ultimately responsible for ensuring security of electricity supply to the country through policies, regulations, and guidance on investments in generation capacity, as well as the general development of the industry. The draft Electricity Bill of 2016 provides for the Minister to develop the National Integrated Resource Plan (NIRP) to guide the long-term development of the generation sector, and to publish regulations and notices to mandate the industry actors to develop specific generation projects and classes of generation projects with a defined total capacity allocation. Thus, although NamPower is responsible for the day-to-day management of supply to meet demand and remains the country's 'supplier of last resort', the responsibility for ensuring long-term electricity supply rests with the Minister.

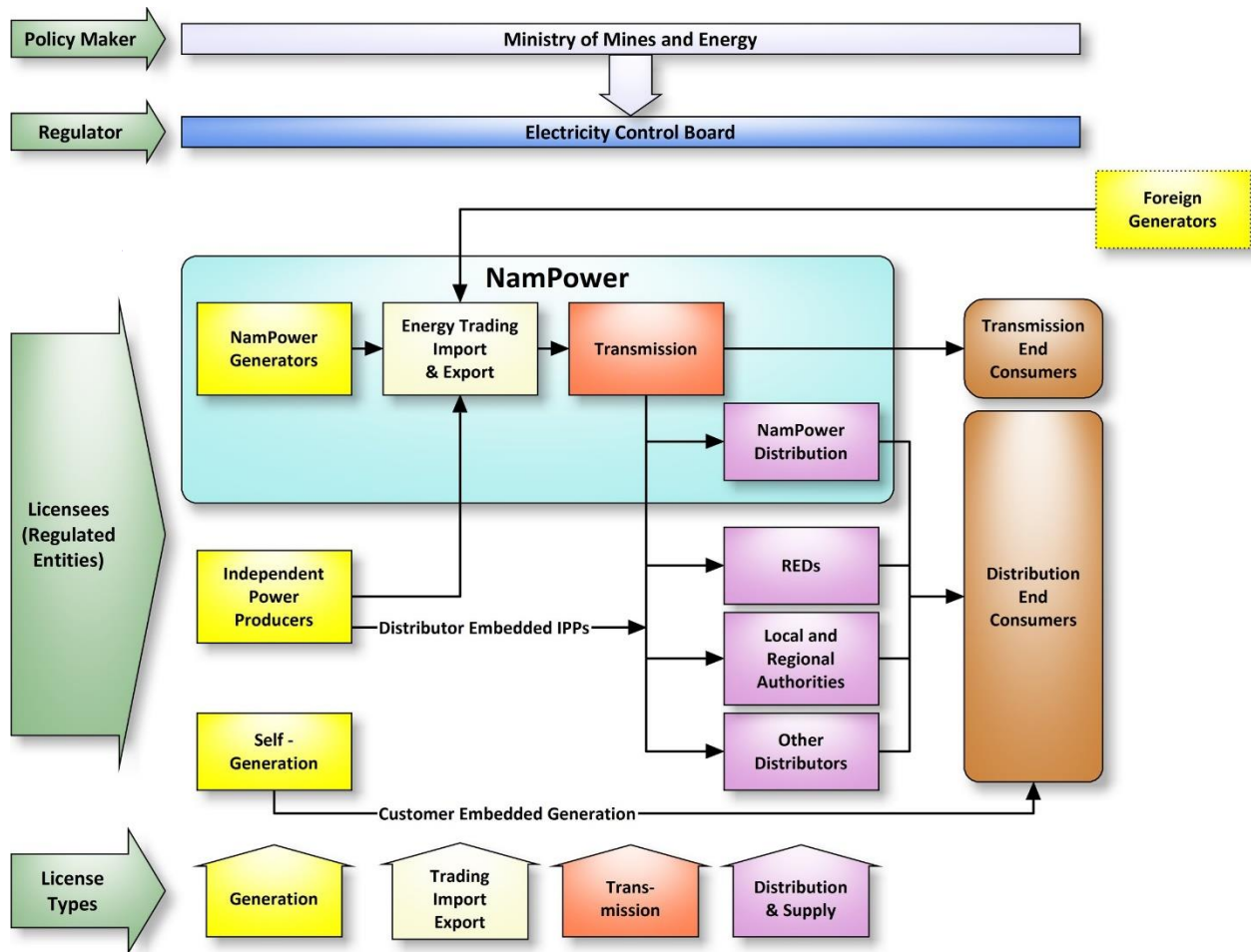


Figure 6: Structure of the Electricity Supply Industry

3.1.1.2 Legal and Regulatory Framework

In 1998, the Ministry of Mines and Energy (MME) released the White Paper on Energy Policy (WPEP). The MME developed the present NEP, as well as the Renewable Energy and Independent Power Producer Policies. In addition, the National Integrated Resource Plan (NIRP), which guides the development of the electricity generation industry, was also developed by the MME.

Under the Electricity Act, the MME has also published notices and regulations for the industry. In 2016, the Ministry has been in the process of developing the Namibia Energy Regulatory Authority Bill, as well as a new Electricity Bill, which will take the country's energy regulations in general, and the electricity sector into the next phase of their development.

Over time, the ECB has developed numerous rules, codes, standards, methodologies and other instruments to regulate the electricity industry – more are in the process of being developed. In combination, these provide a well-developed legal and planning framework for the industry, which continues to see improvements and updates in response to the changing needs of the industry.

The legal and regulatory framework of the electricity industry is depicted in Figure 7, illustrating relevant laws, authorities and instruments.

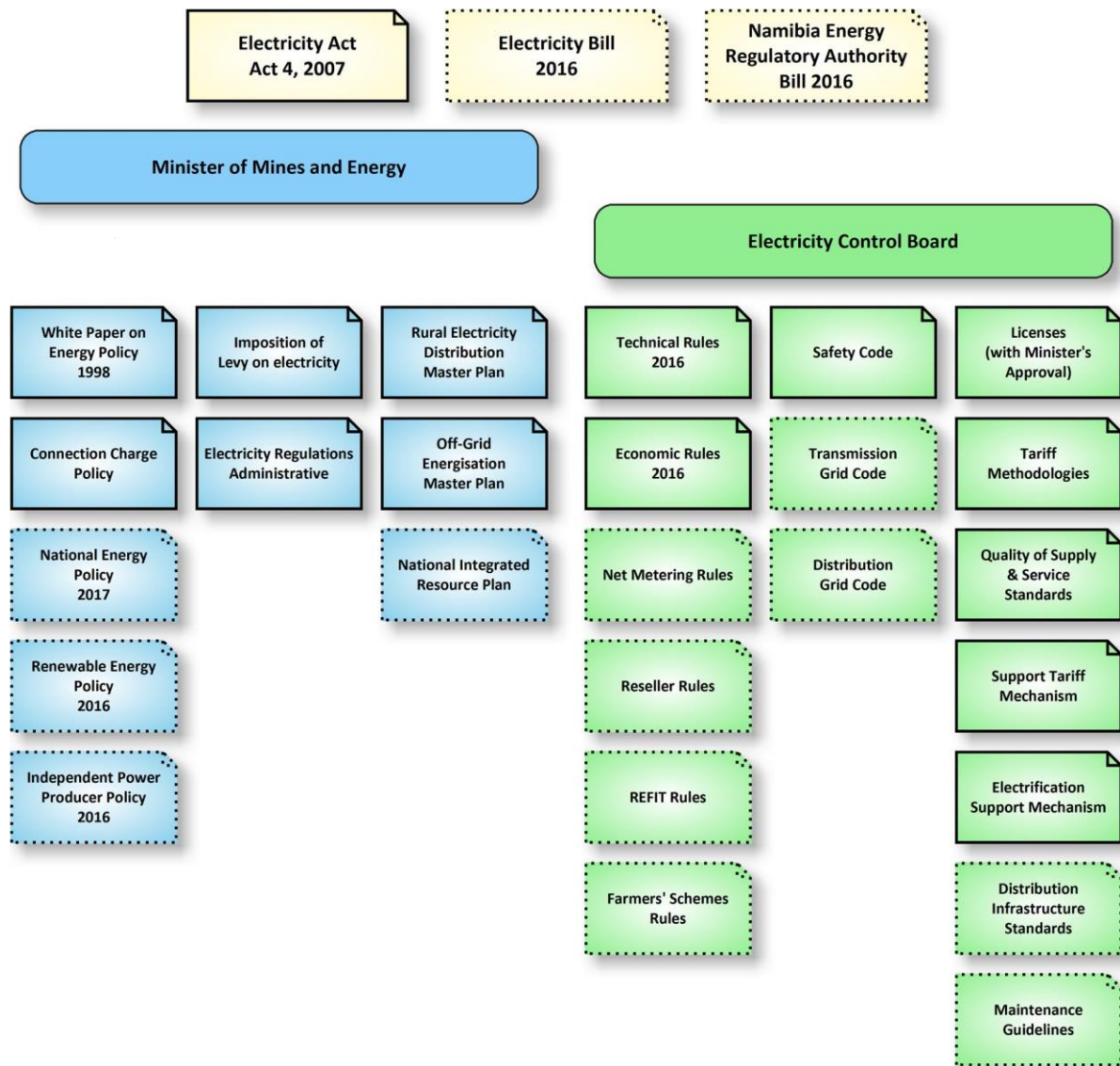


Figure 7: Legal Framework of the Electricity Supply Industry

3.1.2 Electricity Generation

Namibia's electricity generation subsector is faced with the situation that existing generation capacity is well below peak demand, resulting in reliance on imported electricity in terms of both energy and capacity. The most promising local renewable energy potentials are often intermittent in nature, and the development of base load generation from local energy resources has proven difficult. While intermittent generation can certainly contribute to the energy pool in a major way, it does not secure supply at any given time, and it must be backed up by non-intermittent generation sources which introduce additional costs. The 2016 NIRP maps out the country's electricity supply path into the future, and it includes both base-load generation and intermittent renewable generation. Such proposed base-load generation could be supplied by the Kudu Gas to Power project or be based largely on imported fossil fuels (as per the NIRP). Importing fossil fuels could weaken the security of supply, perpetuate a drain on the trade balance of the country, and raise questions about environmental sustainability and climate change. Where feasible, alternatives for base-load generation from renewable sources should therefore be sought.

Development of key large-scale generation projects, have proven challenging. These projects continue to receive considerable attention, and success in developing them would have considerable long-term impacts on security of supply and the trade balance of the country. This could also facilitate future off-shore gas discovery developments if linked to the Kudu infrastructure. However, a singular focus on these projects puts the country's supply position at risk, especially if their development is further delayed.

In terms of natural resources, Government recognises the strategic importance of Namibia's uranium resources, but also acknowledges that the mere presence of such resources does not mean that nuclear power is currently possible, feasible or desirable. At the same time, Government recognises that the development of nuclear energy necessitates the fulfilment of a variety of international requirements, as well as considerable investments in the creation and development of human resources, and the preparation and establishment of the requisite legal, regulatory, institutional and technical frameworks.

Issues:

1. Insufficient local generation capacity to meet peak demand
2. Lack of local base-load generation capacity
3. Increasing reliance on imported electricity
4. Available local energy resources not sufficiently utilised
5. Lack of quantification of potential additional local energy resources and non-optimal focus on certain resources
6. Existing market structure challenges the market entry of newcomers.

Policy Objective: To enhance security of supply through effective use of locally available energy resources while also leveraging regional opportunities.

Policy Statements P1 Electricity Generation

Government resolves to:

- P1.a direct the development of the country's generation sector through a National Integrated Resource Plan (NIRP), which optimises costs for long-term sustainable security of supply, and which will be regularly updated to reflect changing circumstances and technological developments
- P1.b ensure the implementation of the NIRP by facilitating the procurement of generation capacity through timeous procurement notices
- P1.c guide integrated resource planning by prioritising generation projects from renewable, non-polluting, indigenous, diverse, and decentralised resources
- P1.d ensure procurement of sufficient base-load power to strengthen the country's supply security
- P1.e promote dialogue with private investors and financiers to facilitate economically viable and competitive investments in the electricity sector
- P1.f promote the development of IPPs through competitive bidding processes for specified generation capacity allocations

- P1.g ensure local participation in generation projects through local shareholding and local content requirements
- P1.h create opportunities for mini- and micro-generators to feed into the national grid and mini-grid networks
- P1.i prepare the legal, regulatory and institutional framework conditions needed to enable the potential future use of nuclear power generation.

3.1.3 Electricity Transmission

Namibia is a large country with an extremely low population density. For the transmission of electricity, this implies that relatively small amounts of power need to be transported over very large distances. This poses technical and economic challenges. Technically, Namibia's transmission network faces unique stability challenges. Economically, long distances between points of generation and centres of demand raise transmission costs. Demand is growing, creating the need for major new investments to serve demand in many areas.

Issues:

1. Large investments are required to serve a growing demand; however, the level of available funding and tariff impacts remain a concern
2. New large-scale generation projects require major additional transmission investments
3. Transmission losses are significant
4. Third-party wheeling across the country's electricity grid remains unavailable.

Policy Objective: To develop the transmission infrastructure so that capability and coverage are improved, growing demand can be met, and regional trade of electricity is enhanced.

Policy Statements P2 Electricity Transmission

Government resolves to:

- P2.a ensure holistic transmission system planning and timely investments in construction, maintenance, and expansion of the country's transmission infrastructure, and improving the grid's capacity to accommodate decentralised and intermittent generation
- P2.b ensure that transmission losses are managed, based on best practice
- P2.c enable wheeling of power by third parties across the grid, in line with the revised market model that is to be developed
- P2.d support interconnections with neighbouring countries that increase Namibia's trading opportunities and/or improve security of supply
- P2.e support strategic transmission infrastructure investments, using both private and public funding approaches.

3.1.4 Electricity Distribution and Supply¹

Government initiated the Electricity Distribution Industry (EDI) reform process as part of the implementation of the White Paper on Energy Policy of 1998. However, after the creation of three Regional Electricity Distributors (REDs), this process has stalled. Thorough investigations have indicated that the REDs model is still relevant, and stakeholders in 2014 agreed to complete the reform process by establishing two additional REDs. This agreement has not yet been implemented.

The retail price of electricity has risen dramatically over the past decade. This raises questions regarding the affordability of grid electricity for the end-consumer. The cost versus affordability issue is exacerbated by the historical practice of distributors, where much of the fixed cost is recovered through energy charges. This practice distorts the price signal for end-users by over-valuing energy costs which, in turn, incentivises consumers to consider self-generation and possible disconnection from the grid. This could lead to a spiral, where affluent consumers self-generate, sometimes even abandoning the grid entirely, leaving low-income consumers who cannot afford to take such action to endure increasing grid costs. Changing this trend and raising fixed charges to correctly reflect fixed costs of the distribution sector would necessitate a major shift in the approach to pricing and tariff determination, most likely bringing about further electricity price escalations. However, failure to address this issue may undermine the viability of electricity distribution licensees.

Issues:

1. The reform of the country's electricity distribution sector has not been completed, leaving central and southern Namibia in an uncertain dispensation, and perpetuating the problems which the formation of the REDs was to address
2. There is a major, and a growing, backlog in connecting low income households in and around the country's urban centres to the electricity grid
3. The retail price of electricity has more than tripled during the past 10 years, raising affordability and competitiveness questions
4. Distribution losses are significant
5. The increase in customer-installed generation (mostly rooftop solar PV) raises questions regarding the viability of the distributors, whose business model (and tariff structure) is still built predominantly on sales of energy
6. Retail electricity pricing generally does not correctly reflect the balance of fixed versus energy (variable) costs in the industry, leading to major non-cost-reflective price signals which threaten to undermine the long-term economic viability of the distribution licensees.

Policy Objective: To assure the continued economic viability and cost effectiveness of the distribution grid and its associated sector.

Policy Statements P3 Electricity Distribution and Supply

Government resolves to:

- P3.a complete the EDI reform process by implementing the resolutions of the 2014 EDI summit, including the establishment of a Central RED and a Southern RED

¹ Access to electricity, together with access to other forms of energy, is covered in the section on Cross-Cutting Themes, refer to section 3.6.

- P3.b ensure that end-consumer electricity prices correctly recover fixed and variable costs, and convey relevant price signals to encourage efficiency
- P3.c facilitate the development of a long-term strategy regarding the development of the distribution grid to ensure its economic viability
- P3.d compel distribution licensees to actively investigate and, where feasible, implement relevant grid technologies that improve the management of the distribution grid, reduce losses, enhance quality of supply, and increase the grid's capacity to accommodate small-scale grid connected decentralised generation, storage and demand side management measures.

3.1.5 Import and Export of Electricity

Currently, Namibia imports more than half of its annual electricity requirements. This creates a high level of dependence on the availability and reliability of foreign generators, as well as on the transmission networks used to import such electricity, including those in neighbouring countries. Despite some import contracts offering firm power and attractive prices, the associated risks, as well as the negative impact that such imports have on Namibia's trade balance, constitute a national strategic security of supply risk.

However, aiming for national self-sufficiency is unlikely to be economically justifiable, and it may be regarded as conflicting with various regional agreements and treaties that Namibia subscribes to. Various SADC protocols, initiatives and plans explicitly call for a regional approach to infrastructure development, seeking to optimise investments not only from a national perspective, but also from a regional one.

By seeking to optimise its electricity mix through a combination of local production and imports and exports of electricity, Namibia aims to optimise both the resulting cost of energy and the security and reliability of electricity supply.

Issues:

1. Namibia imports more than half of its annual electricity requirements
2. Import and export contracts are negotiated by the NamPower Trading Division, directly with foreign utilities, with limited regulatory oversight and little Government assistance
3. Allowing IPPs to export electricity may use up available grid capacity needed to supply local demand.

Policy Objective: To support economically efficient levels of imports and exports of electricity, and to maximise the opportunities offered by regional protocols and organisations.

Policy Statements P4 Import and Export of Electricity

Government resolves to:

- P4.a guide activities relating to the import and export of electricity with a view to maximise the benefits to the economy
- P4.b strengthen regulatory oversight regarding imports and exports guided by international best practice.

3.1.6 Electricity Regulation

The regulatory environment for electricity is generally well-developed. However, some gaps exist, as are further discussed below. In addition, new requirements arise as the sector develops.

Perhaps most prominently, IPPs face a complex and onerous regulatory and legal environment which involves many agencies and requirements, not just within the electricity regulation, but also the accompanying frameworks such as those related to environmental aspects, land acquisition, business registration, labour, and other compliance requirements. These and related factors increase transaction costs and constitutes a significant barrier to market entry. Furthermore, as the regulatory framework is designed for large, well-endowed and experienced participants, it is not suitable for smaller, local projects.

Issues:

1. Combined regulatory requirements for generation market entry are considered being complex and onerous, especially by smaller-scale participants
2. Policy and regulatory frameworks for procurement of new generation capacity has been less than transparent
3. Enforcement of license conditions is, in many cases, lacking
4. Regulation of electricity prices is an increasingly difficult balancing act between achieving and maintaining cost reflectivity and maintaining affordability
5. While material cross-subsidies exist between consumer-groups in the ESI, these are neither fully quantified nor actively regulated or designed for maximum economic benefit
6. Energy efficiency and demand side management have not been widely adopted and taken up in a co-ordinated manner in the ESI, largely because of not having been enforced and regulated.

Policy Objective: To consistently apply fair and transparent regulation to provide a firm, predictable and transparent regulatory framework for the country's electricity sector.

Policy Statements P5 Electricity Regulation

Government resolves to:

- P5.a complete the transformation of the ECB into a National Energy Regulatory Authority
- P5.b ensure that efficiency, cost effectiveness and innovation are achieved across the electricity industry through the regulatory framework
- P5.c facilitate the establishment of a 'one-stop-facilitation' centre for licensing, permitting, land acquisition, and compliance matters
- P5.d strengthen the sectoral regulatory approach to meet the needs of a diversified electricity industry, specifically those of new market entrants and smaller participants
- P5.e maintain the principle that electricity tariffs should reflect the long run marginal cost of electricity supply, with exceptions allowed through targeted Government subsidies, approved cross-subsidies, as well as targeted Government infrastructure investments
- P5.f support the Regulator to monitor and enforce license conditions
- P5.g ensure that all licensees apply best-practice monitoring, evaluation and verification.

3.1.7 Electricity Market and Trading of Electricity

In 2000, following the outcomes of studies that were initiated in the wake of the WPEP, Cabinet accepted the single buyer market model for Namibia's electricity sector. However, in view of the changing nature of the country's electricity supply industry, the idea of introducing a modified single buyer market model has been extensively deliberated throughout the industry, and no conclusion on a way forward has been reached. The absence of conclusive evidence of the implications that a modified market model may have is a key impediment. In addition, a critical part of this discussion involves the establishment of an independent system and market operator that could function separately from NamPower. While an independent structure would likely create a more level playing field, such a development also carries risks, which have so far not been elaborated in detail, for the country, as well as NamPower.

Issues:

1. The single buyer market model may restrict further development of IPPs
2. Imports and exports are undertaken exclusively by the NamPower Trading Division
3. A modified single buyer market model has not been fully investigated, and its technical, economic and risk implications remain uncertain
4. While extracting the trading function from NamPower and turning it into an independent system and market operator has been contemplated before, it has not been assessed in detail, and its impacts on the country's electricity industry and its viability remain largely unknown.

Policy Objective: To align the Namibian electricity market model to best serve prevailing needs.

Policy Statements P6 Electricity Market and Trading of Electricity

Government resolves to:

- P6.a guide the creation of a diverse and efficient electricity market that fosters Namibia's socio-economic development
- P6.b enhance and develop NamPower's value as a national electricity sector asset.

3.1.8 Energy Efficiency and Demand Side Management in the Electricity Sector

Namibia's energy-use continues to be characterised by its high energy intensity, and low adoption and use of energy-efficient technologies and practices. In addition, end-user behaviours are mostly not influenced by the actual time-of-use cost of electricity supplies. Efforts to improve the sector's efficiency in general and the uptake of energy efficient technologies and practices have remained disjointed and largely limited in both scale and scope. There are many opportunities to make improvements that would contribute to savings for both individual consumers and the industry at large, resulting in ultimate positive implications on the Namibian economy.

Although a Demand Side Management (DSM) study was completed by the ECB in 2006, its recommendations have not yet been systematically implemented. DSM has not been properly institutionalised, and DSM initiatives undertaken by various ESI and EDI actors remain disjointed.

Issues:

1. Energy efficiency (EE) measures continue to play a secondary role amongst most electricity consumers

2. The value of energy efficiency in relation to avoided generation is not well quantified, and therefore often poorly understood, and, in most cases, it is not part of investment decisions
3. Energy management and demand side management are not actively regulated
4. Although a variety of demand side management measures have been identified in the past, most have not been implemented.

Policy Objective: To apply demand side management and energy efficiency measures systematically and consistently throughout the country's electricity supply chain.

Policy Statements P7 Energy Efficiency and Demand Side Management in the Electricity Sector

Government resolves to:

- P7.a ensure that the necessary legal and regulatory instruments are developed for the sector-wide adoption of demand side management and energy efficiency measures
- P7.b mandate and resource the Regulator to develop demand side management and energy efficiency measures and programmes
- P7.c mandate the Regulator to ensure the implementation of demand side management and energy efficiency measures and programmes by licensees
- P7.d ensure that demand side management and energy efficiency measures and programmes are adequately monitored, evaluated and verified.

3.1.9 Energy Storage

Without energy storage, the value of intermittent renewable generation options is greatly reduced by the need for investment in firm back-up generation options. Cost-effective energy storage can potentially unlock this limitation and, in this way, create additional avenues for the integration of intermittent generation sources into the generation mix. Energy storage costs are expected to decline rapidly over the coming years, thereby becoming increasingly relevant and economically viable.

Issues:

1. Modern energy storage is generally seen as a critical factor that enables a larger uptake of intermittent generation sources in the national electricity mix
2. Grid stability and an increasing proportion of decentralised intermittent generation sources which form part of the national electricity mix necessitate that energy storage technologies become an important part of the country's electricity infrastructure.

Policy Objective: To prepare for the integration of energy storage technologies into the country's electricity system.

Policy Statements P8 Energy Storage

Government resolves to:

- P8.a create the relevant provisions in the country's legal, regulatory and tariff framework to enable the use of both large and small-scale energy storage technologies
- P8.b** ensure that the design of new transmission and distribution infrastructure accommodates the integration of energy storage systems.

3.2 Upstream Oil and Gas Sector

3.2.1 Introduction

Namibia's Constitution stipulates that the ownership of oil and gas resources is vested, on behalf of the country's people, in the state and is to be managed in a way that benefits all Namibians.

The Namibian upstream oil and gas sector refers to the reconnaissance, exploration and production of oil and gas resources. The stages within the upstream industry include the acquisition and interpretation of seismic and geological data, the search for hydrocarbon resources, the drilling of exploratory and appraisal wells, and, if any discovery is deemed economically viable and recoverable, the development and production of crude oil and natural gas.

3.2.1.1 Current Status

Namibia has proven gas reserves, such as the Kudu Gas Field. There is a potential to discover further onshore and offshore commercially viable petroleum resources as most of the country's geological basins are still considered under-explored.

Soon after independence Namibia adopted a petroleum licensing system to allow exploration and production activities and successfully attracted major oil companies through formally scheduled licensing rounds. In 1999, an open licensing system was adopted as an alternative to bidding rounds. Currently, several international oil and gas companies carry out reconnaissance and exploration work through joint venture arrangements with one another and/or together with NAMCOR. To date, there are 41 active exploration licenses: 32 are held by operators, three are reconnaissance licenses, and a single production license, i.e. the Kudu Gas Field.

Overall, a total of 22 oil and gas wells have been drilled offshore Namibia, 19 of which since independence. These comprise 15 exploratory wells and 7 appraisal wells (Kudu Gas Field/license area). In addition, 10 deep-sea research wells and 10 exploratory wells have been drilled on-shore. The work carried out so far has allowed Namibia to acquire significant geological and geophysical data. Presently, offshore 2D seismic survey coverage stands at about 147 000 line kilometres, and more than 40 423 km² of 3D seismic data has been acquired by license operators. Furthermore, since 1998, a total of 28 000 kilometres of aeromagnetic data was acquired, covering the entire Namibian offshore area.

In terms of capacity building efforts in the industry, the Petroleum Training and Education Fund (PETROFUND), which was set up as a Government and industry initiative, has sponsored several Namibians to study various oil and gas disciplines. The PETROFUND was established under the Petroleum (Exploration and Production) Act of 1991, requiring that oil companies granted with exploration rights contribute an agreed amount of money to the fund for the training and education of Namibians in the oil and gas industry. The MME and NAMCOR, supported by the Namibian Petroleum Operators Association, have also provided short training courses for their staff and members of the public.

3.2.1.2 Structure of the Upstream Oil and Gas Sector

Figure 8 illustrates the structure of the upstream oil and gas sector.

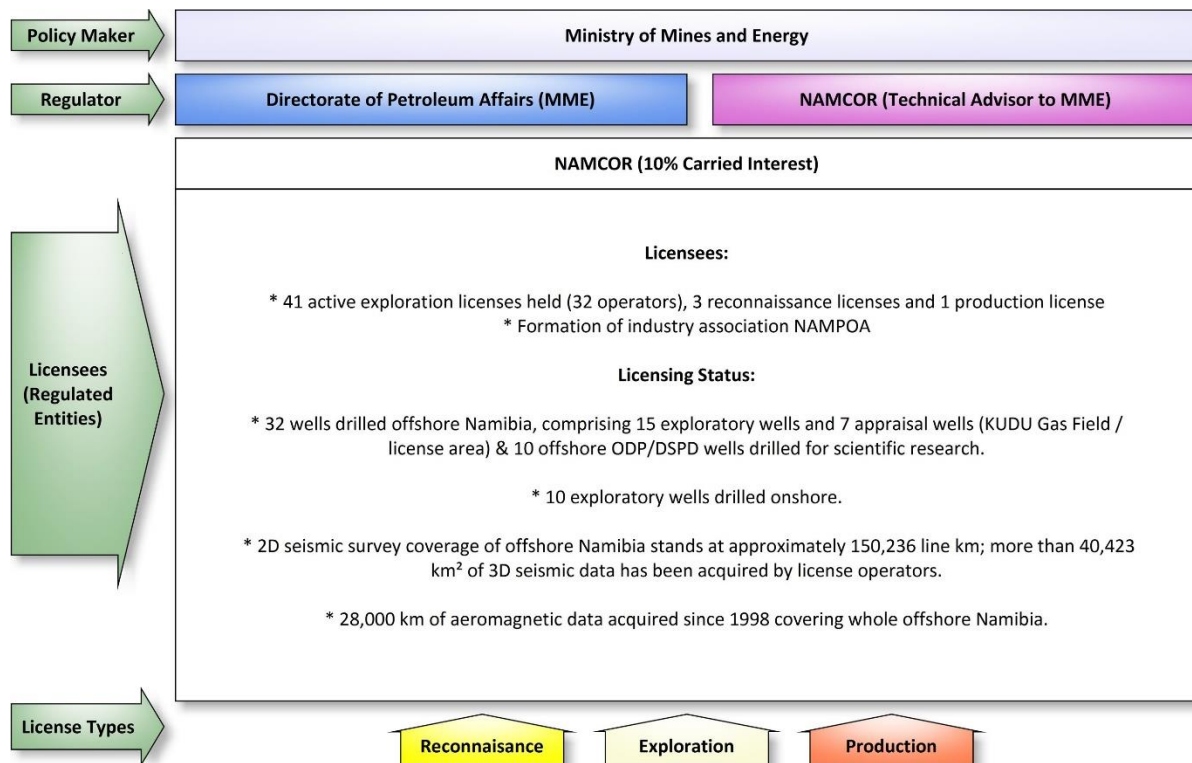


Figure 8: Structure of the Upstream Oil and Gas Sector

The Ministry of Mines and Energy (MME) is responsible for the regulation of the upstream oil and gas sector, as well as issuing licenses for petroleum reconnaissance, exploration and production operations. The MME's **Directorate of Petroleum Affairs (DPA)**, through the Petroleum Exploration, Production and Promotion Division, regulates, promotes and facilitates activities in Namibia's upstream sector. Its overall objective is to strengthen the institutional arrangements and capacities to ensure well-coordinated results-focused outcomes on resource, environmental and revenue management, as well as HSE management in the oil and gas sector, and to strengthen the administration of the upstream petroleum sector in Namibia. The Division aims to ensure that petroleum resources are administered in a way that they contribute to the sustainable development of the national economy, and to the welfare of the people of Namibia. Furthermore, it aims to strengthen the administrative functions regarding its policies, and to strengthen the legislative and institutional framework based on the petroleum development areas where there are challenges present in Namibia. The DPA's task is to promote the petroleum sector through the development of policies and legislation for petroleum exploration, development and production activities.

The Geological Survey of Namibia (GSN) is a directorate of the MME, and is the custodian of Namibia's geological resource database. The role of the GSN includes providing geo-scientific information, guiding land-use decisions to ensure the availability of resources, and creating awareness on the benefits of the earth sciences in Namibia.

The National Petroleum Corporation of Namibia (NAMCOR) is a legally enacted entity with limited liability under the Namibian Companies Act of 1973, and the Government is its sole shareholder. Under the Petroleum (Exploration and Production) Act of 1991, NAMCOR has the right to carry out reconnaissance, exploration and production operations, either on its own or in partnership. NAMCOR's upstream activities include exploration and production, promotion, and maintenance of a

technical advisory role to the MME. Additionally, NAMCOR has the role of advising the MME on issues relating to the negotiation of terms and conditions of the Petroleum Agreement. To ensure state participation in the sector, the MME requires NAMCOR to be party to all petroleum licences with 10% participation rights. NAMCOR obtains this participation interest from the start, which typically is carried throughout the exploration phase. Should production begin, NAMCOR has the option to either fund its pro-rata share of costs, or to dilute its shares.

In 2016, the **Ministry of Public Enterprises (MPE)** was established to monitor the activities of commercial public enterprises, including NAMCOR. NAMCOR therefore reports to the Minister of the MPE on all matters relating to its commercial activities.

3.2.1.3 Legal and Regulatory Framework

The legal and regulatory framework of the upstream oil and gas sector is depicted in Figure 9, showing the various applicable laws, authorities and instruments.

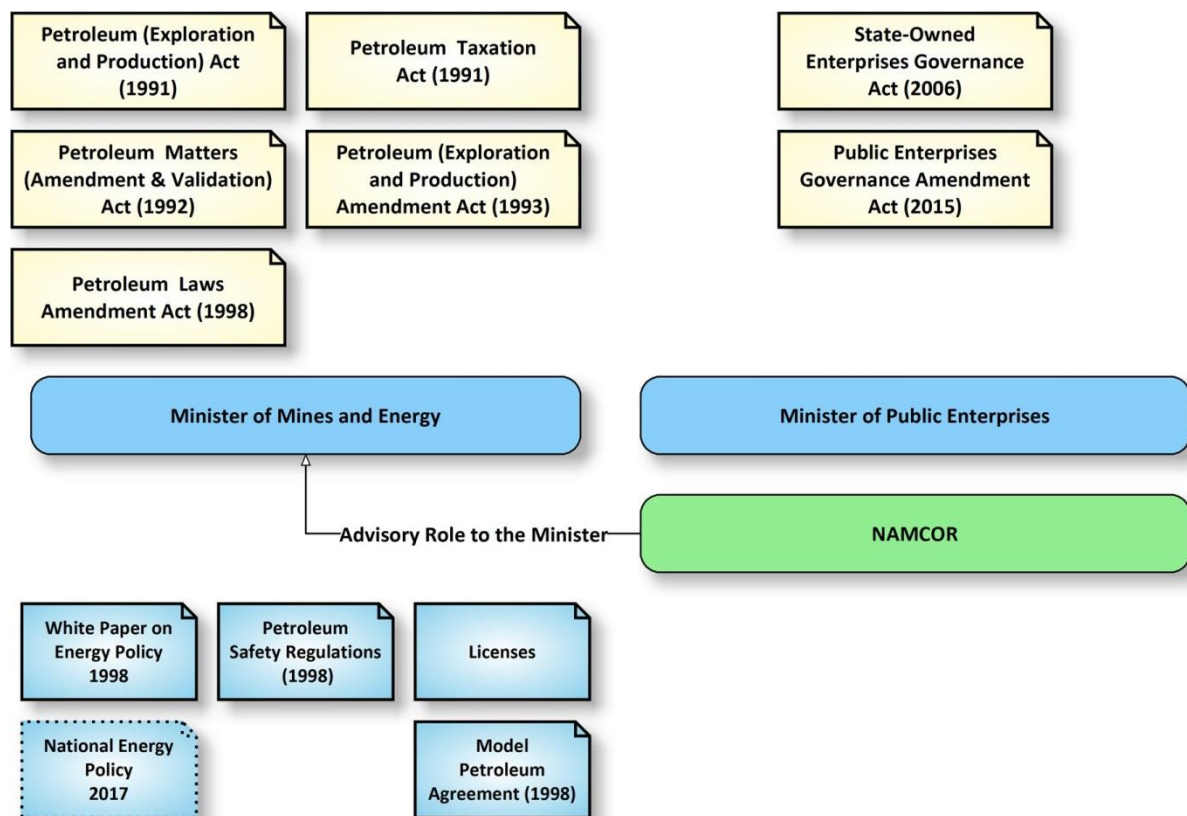


Figure 9: Legal Framework of the Upstream Oil and Gas Sector

Namibia has a well-established upstream oil and gas licensing regime. Conditions for granting petroleum licences are set out in the **1991 Petroleum (Exploration and Production) Act**, and the **Model Petroleum Agreement (MPA)**. The Petroleum Act provides for the granting of reconnaissance, exploration and production licences, while the MPA forms the contractual basis between the MME and the successful license applicant.

Government reserves the right to participate in the exploitation of licence areas through NAMCOR, which may also be a joint holder of a licence.

A **reconnaissance licence** is valid for up to one year, and may be renewed three times, each renewal not exceeding a one-year total extension period. Licences do not bestow exclusive rights to the owner.

An **exploration licence** is exclusive, and can be valid for up to four years. It may be renewed for two consecutive terms, each valid for two years. At least 50% of the license acreage under the exploration licence must be relinquished at the end of the first renewal exploration period, and at least a further 25% before entering the second renewal exploration period.

A **production licence** grants the holder the exclusive right to carry out production operations on one or several blocks to which the licence relates, and to sell or otherwise dispose of the petroleum extracted. The licence is granted for an initial period of 25 years, and may be renewed once for a maximum of 10 years.

The petroleum sector's fiscal regime is set out under the **1991 Petroleum (Exploration and Production) Act** as well as the **1991 Petroleum Taxation Act**. It includes a royalty clause, i.e. the Petroleum Income Tax (PIT) and an Additional Profit Tax (APT) stipulations, as set out below:

- **Royalty:** production licence holders must pay a royalty, which is currently set to 5% of the market value of the petroleum produced and saved during that quarter. On application by a license holder, the MME may remit all or part of the royalty, defer its payment, or refund it.
- **Petroleum Income Tax (PIT):** PIT is levied currently at 35% of taxable income, i.e. the amount remaining after all allowable deductions and losses. As an incentive, exploration expenditure incurred in any licence area in Namibia may be deducted from a licensee's PIT taxable income from a producing licence area.
- **Additional Profit Tax (APT):** APT applies if operations earn an after-tax return. The first APT is established at 25% (for the existing Kudu licence, it is 33%), and the incremental second and third tier APT rates are biddable and negotiated with prospective bidders, where agreed rates are set out in the respective petroleum agreement.

3.2.2 Promotion of Exploration and Production

The commercial discovery of oil and gas resources would significantly contribute to the Namibian economy, the attainment of national development goals, and improve the livelihoods of present and future generations. It is therefore essential for the Government to promote the country's exploration potential, and attract local and foreign investment in the sector. Since independence, the MME and NAMCOR have actively promoted the country's exploration, development and production potential, and have attracted major oil industry players, resulting in investments in the Namibian oil and gas industry, which are estimated at N\$ 25 billion. Government is cognisant of the challenges of the oil and gas industry, including its capital intensive and high-risk nature, the lack of exploration successes, and the recent fall in the oil prices. Therefore, a conducive and internationally competitive investment framework that attracts reputable oil and gas companies is critically important. Government will therefore continue to market and promote exploration activities actively and sustainably.

Issues:

1. Namibia has proven natural gas reserves, such as the Kudu Gas Field, however, the country is yet to discover commercially viable petroleum resources
2. Oil and gas exploration is both capital-intensive and high-risk in nature, and future exploration activities require significant capital investments
3. Namibia's investment framework needs to be highly attractive to compete for limited international exploration funds

4. Current global market conditions, and low oil prices, have dampened the appetite of most investors.

Policy Objective: To attract and sustain investment in Namibia’s upstream oil and gas sector.

Policy Statements P9 Promotion of Exploration and Production

Government resolves to:

- P9.a strengthen the national investment climate, to ensure certainty, stability and competitiveness through favourable commercial, legal and fiscal terms
- P9.b facilitate private sector investments, and support the development of necessary expertise in the exploration and development of the country’s oil and gas resources
- P9.c promote investments in the oil and gas sector at international, regional and national events
- P9.d encourage collaboration between existing license holders to carry out joint exploration programmes.

3.2.3 Upstream Petroleum Regulation

Effective implementation and management is key for the sustainable development of the oil and gas industry. To achieve this necessitates a transparent and robust legal and regulatory regime, and strong institutional and human capacities, as well as access to financial resources.

MME is the regulator of the petroleum sector in Namibia. The DPA carries out the regulatory functions within the MME, to ensure compliance with the Petroleum Act, and to protect the health and safety of the people working in the industry, as well as the environment. Presently, NAMCOR assists the MME in the regulation of the sector, and also advises the Minister on issues relating to the negotiation processes with investors, including the determination of the terms and conditions of petroleum agreements to be signed by the MME and successful license applicants. NAMCOR’s role as a commercial entity and technical advisor to the MME has the potential for conflict of interests.

Issues:

1. Namibia’s regulatory framework needs review and incorporation of international trends and practices
2. A well-developed regulatory regime is essential to protect HSE, and to attract investments
3. The regulatory and commercial functions of NAMCOR overlap
4. The DPA’s regulatory capacity is still in its infancy, and in need of further development.

Policy Objective: To develop a transparent and effective regulatory environment for the country’s upstream petroleum sector.

Policy Statements P10 Upstream Petroleum Regulation

Government resolves to:

- P10.a ensure that the legal, fiscal and regulatory frameworks promote and retain investments in the oil and gas sector, and are consistent, stable and transparent, and in line with international industry practice
- P10.b maintain an efficient, competitive and transparent licensing system

- P10.c strengthen the regulatory institutions to effectively fulfil their mandates, and enforce regulations
- P10.d streamline regulations and institutional arrangements
- P10.e strengthen the human resource capacities of the regulatory institutions
- P10.f ensure that the regulatory framework provides for the protection of health, safety and the environment during oil and gas operations
- P10.g promote inter-ministerial collaboration to ensure coordination at policy, regulatory and operational levels relating to the development of the country's petroleum resources.

3.2.4 Geoscience Data Collection and Management

Namibia has extensive geological and geophysical databases, which are administered and maintained by the Geological Survey of Namibia, and NAMCOR. Data collection is mainly carried out through research and the acquisition of seismic surveys, which are used to promote Namibia's geological potential and to attract investment. All data acquired by license holders during petroleum operations is the intellectual property of the Namibian Government. Furthermore, NAMCOR is the custodian of all the exploration and production data, and promotes the data to potential investors. This data covers seismic, wells, engineering, exploration, aeromagnetic and gravity reports that have been acquired through reconnaissance and exploration activities.

Issues:

1. Resource data is valuable, and constitutes an important investment in the development of the country's natural resources
2. The acquisition, collation, use and sale of petroleum geo-scientific data is a prerequisite for a successful national exploration programme
3. Many the onshore and offshore licence blocks are covered by 2D and 3D seismic surveys, thus adequately mapping out Namibia's exploration potential
4. However, large parts of the country still require extensive geo-scientific surveys to effectively define the country's geological and hydrocarbon potential
5. The utilisation, promotion and marketing of the seismic, geological and geophysical exploration data and associated information is a valuable source of income for NAMCOR
6. Namibia's geo-resources databases require on-going development and maintenance.

Policy Objective: To maintain and enhance the oil and gas resource data for the effective promotion of investments.

Policy Statements P11 Geoscience Data Collection and Management

Government resolves to:

- P11.a promote and facilitate effective data gathering in line with international best-practices
- P11.b enhance the oil and gas resource database to promote Namibia's oil and gas resource potential
- P11.c strengthen the human and technical resources to effectively utilise and manage the country's geological, geo-scientific and exploration data and information

P11.d encourage partnerships in the exchange of data to minimise exploration costs

P11.e strengthen appropriate mechanisms for access to data and information, while safeguarding their confidentiality.

3.2.5 Health, Safety, and Environmental (HSE) Considerations

Upstream petroleum operations in Namibia are subject to the fulfilment of specific HSE obligations, which can be found in the petroleum safety regulations of 1998, and specific petroleum agreements. These form the basis of the regulatory and contractual arrangements between the MME and operators. In order to ensure the prudent use of Namibia's natural resources, the protection of the environment, and the safety of the people working in the industry, these agreements outline the steps to be undertaken as part of the petroleum exploration activities. The contractual and regulatory framework includes guidance on the types of environmental studies required under the petroleum license (exploration and production) including the installation and use of equipment and the eventual decommissioning of all infrastructure at the end of petroleum operations. Presently, environmental management in Namibia is governed by the Constitution, the Environmental Management Act of 2007, the Environmental Impact Assessment (EIA) regulations of 2012, and the Petroleum Exploration and Production Act 1991. Namibia's international obligations for the protection of the marine environment are laid down in the United Nations Law of the Sea Convention of 1982, and the International Convention for the Prevention of Pollution from Ships of 1973.

Issues:

1. The impacts of oil and gas exploration and production activities on the environment and the lives of people can be catastrophic unless undertaken with due care and within the ambit of an effective regulatory framework
2. Oil and gas exploration and production activities require effective regulation and compliance with the health, safety, and environmental requirements, to ensure the health and safety of all persons involved or otherwise affected by such operations, and the protection of the environment.

Policy Objective: To ensure that the country's petroleum resources are explored and exploited in an environmentally sound and safe manner, and that the health and safety of all persons involved in the sector is protected.

Policy Statements P12 Health, Safety, and Environmental Considerations

Government resolves to:

P12.a ensure that environment, health and safety are protected, considering international best-practices

P12.b ensure that the 'polluter pay principle' is applied in the regulation and enforcement of environmental management

P12.c facilitate inter-ministerial collaboration to develop and maintain a safe and healthy working environment throughout the sector

P12.d ensure compliance with decommissioning obligations and programmes in the petroleum sector.

3.2.6 Local Content and Participation

Through the indigenisation of knowledge, expertise and technologies, the overall goal of the upstream oil and gas sector is to ensure the exploration and successful development of the country's oil and gas resources for the benefit and welfare of all Namibians. It is therefore important that Namibia puts appropriate policies in place to capture and retain the value created from petroleum resources, including through a focus on local content and participation.

The oil and gas value chain includes ownership, transfer of technology, investments in operations, provision of goods and services, job creation, value addition and skills and enterprise development. Government recognises that the industry is highly specialised, high-risk and capital-intensive, and that the Namibian industry is at an infant stage (exploration) therefore currently opportunities for local content are limited. In terms of skills development and knowledge transfer, oil companies granted with exploration rights are required to make contributions to the PETROFUND for the training and education of Namibians in oil and gas disciplines.

Issues:

1. Absence of a local content and participation policy
2. Lack of Namibian companies with experience in the oil and gas sector
3. The development of the local vocational and technical skills base remains inadequate
4. Namibian participation in the industry remains low
5. The local service sector for the oil and gas industry is not well-established.

Policy Objective: To progressively develop and increase local capacity in all aspects of the oil and gas value chain.

Policy Statements P13

Local Content and Participation

Government resolves to:

- P13.a ensure the use of local expertise, the procurement of local goods and services, and the transfer of technology and know-how to Namibia
- P13.b promote the meaningful participation of Namibians, including ownership, across the oil and gas sector value chain
- P13.c facilitate capacity building of Namibian businesses engaged in the oil and gas industry
- P13.d foster the establishment of service sectors which are related to upstream oil and gas activities.

3.2.7 Managing the Future

A commercial oil and gas discovery could significantly contribute to the national economy and poverty alleviation. It is therefore important to design a clear mechanism to manage the proceeds from the oil and gas industry in a transparent manner, to the benefit of society at large, and to avoid the resource curse, which is so prevalent in well-established oil producing countries. Therefore, an appropriate legislative and institutional framework is required that regulates the oil and gas industry, before, during and following successful production activities. Appropriate steps must therefore be taken to ensure that the profits from production are transparently and competently managed.

Issues:

1. Guidelines on the distribution of wealth emanating from future oil and gas discoveries are lacking
2. In the event of a successful discovery and production of commercial hydrocarbon resources, prudent revenue management is essential
3. It is important that Government effectively manages the expectations of the people involved on the economic benefits following a discovery and development
4. Transparency and good governance are important pillars to manage the oil and gas industry.

Policy Objective: To ensure that profits from the exploration, development and production of the country's oil and gas resources result in the benefit of present and future generations of Namibians.

Policy Statements P14 Managing the Future

Government resolves to:

- P14.a manage oil and gas revenues in the event of a discovery and production in a transparent, accountable and equitable manner
- P14.b establish a petroleum fund to ensure savings for future generations, and facilitate further growth in the oil and gas sector
- P14.c facilitate the use of revenues for the diversification of the Namibian economy
- P14.d promote the progressive development of an oil and gas service sector
- P14.e collaborate with relevant line ministries and agencies on the management of revenues from the oil and gas sector.

3.3 Downstream Liquid Fuels Sector

3.3.1 Introduction

Namibia's downstream liquid fuels sector encompasses the import, wholesale and retail part of the country's petroleum industry. In future, the sector may also include the refining of petroleum products.

3.3.1.1 Current Status

Namibia imports 100% of its liquid fuels, mainly from South Africa and from other international sources. Products include petrol, diesel, jet fuels, heavy fuel oil, liquid petroleum gas, illuminating paraffin, lubricants, and bitumen. Namibia's on-going dependence on fuel imports not only constitutes a security of supply challenge, but also remains an issue of national strategic importance.

The downstream oil sector, which includes petrol, diesel, and related liquid petroleum products, accounts for some 63% of Namibia's total annual energy consumption. Due to the geographical location and vast distances between population centres, the road transport sector is the most important user of liquid petroleum products, followed by rail and sea transport. The second largest liquid fuels-consuming sectors include the fishing and other industries.

Namibia consumes approximately one billion litres of automotive fuels per year. These fuels are imported, marketed and distributed by four oil marketing firms, namely, Engen, Puma, Total and Vivo Energy. Liquid fuels are imported through the Port of Walvis Bay, and then trucked or railed to inland depots from where they are delivered to outlets. Access to affordable petroleum is pivotal for the country's sustained socio-economic development. Currently, rural pump prices are subsidised through the National Energy Fund to cover transport costs, and to ensure that people in rural areas can afford such fuels.

3.3.1.2 Structure of the Downstream Liquid Fuels Sector

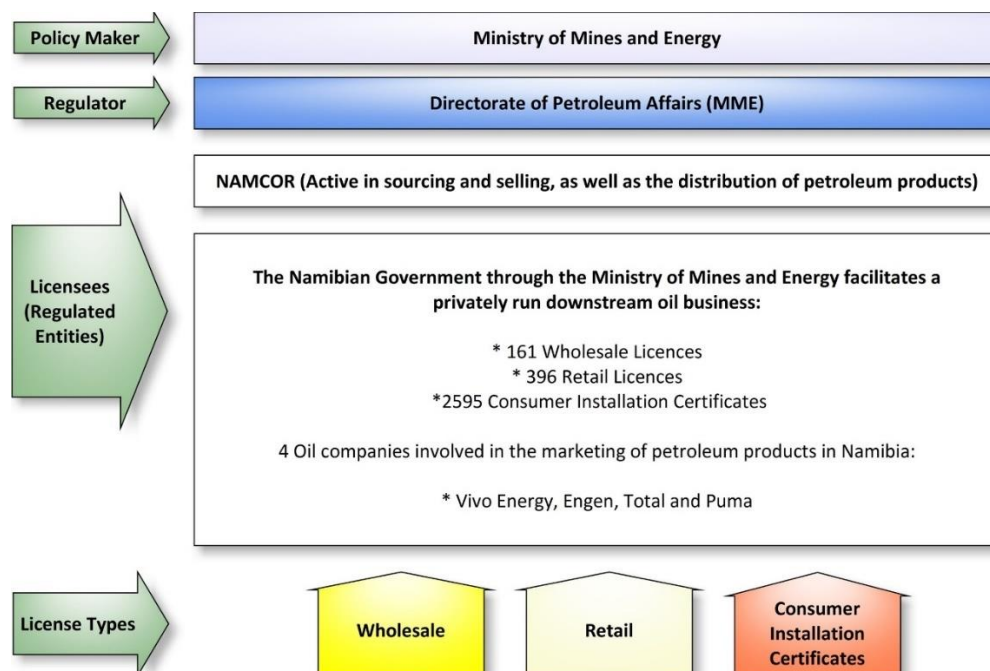


Figure 10: Structure of the Downstream Liquid Fuels Sector

The **Ministry of Mines and Energy (MME)** is responsible for the regulation of the petroleum sector. These responsibilities include the issuance of licenses for downstream petroleum activities, regulation of petroleum product prices, price equalisation, as well as the export and import control of petroleum products.

The MME's **Directorate of Petroleum Affairs (DPA)** is responsible for the regulation of the downstream sector and associated petroleum-related legislation. DPA's mandate is to ensure the adequate and affordable supply of petroleum products. Its functions include monitoring the activities of oil companies responsible for petroleum distribution in the country, building relevant national capacity, and ensuring that fuel prices are regulated, adjusted and equalised as required.

The MME's **Petroleum Supply and Distribution Division** is responsible for the facilitation of the entire value chain of liquid fuels, from port of entry to end-users. It is comprised of two sub-divisions: The Petroleum Supply and Logistics sub-division, which deals mainly with the administrative issues of the directorate, and the Petroleum Distribution and Licensing sub-division, which deals with the evaluation and issuance of license applications.

In the downstream sector, **NAMCOR** participates, in line with its strategy of building an integrated oil company, in the supply of select commercial customers, and owns and operates several fuel depots around the country. In addition, in cooperation with Sasol Oil Ltd., NAMCOR markets and distributes its own branded lubricants. With regards to its commercial activities and operations, NAMCOR reports to the Ministry of Public Enterprise (MPE).

The **National Energy Council (NEC)** is mandated to advise the Minister of the MME on energy matters. Members of the NEC are nominated by relevant Government institutions, and are appointed by the Head of State. The **National Energy Fund (NEF)** collects levies imposed on petroleum products, such as the petroleum equalisation levy, and the levy on the sale of electricity. In this way, the NEF collects funds for the Motor Vehicle Accident Fund and Road Safety Secretariat, and makes available funding for select investments in the electricity sector. The NEF is also responsible for the road subsidy of transporters delivering fuel to outlying rural areas.

3.3.1.3 Legal and Regulatory Framework

The legal and regulatory framework of the downstream oil and gas sector is depicted in Figure 11, showing laws, authorities and instruments.

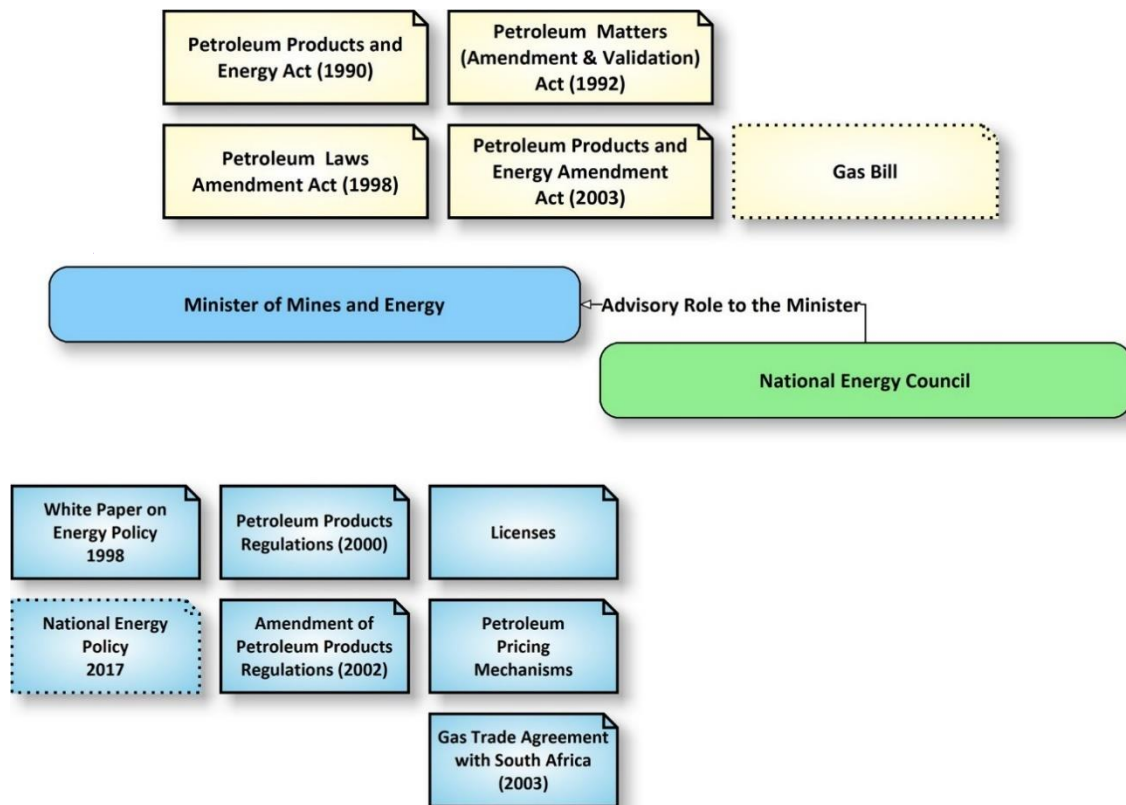


Figure 11: Legal Framework of the Downstream Liquid Fuels Sector

Sector activities are regulated in terms of the **Petroleum Products and Energy Act of 1990**, and its amendments. In 2000, the Ministry of Mines and Energy introduced the **Downstream Petroleum Regulations**, which regulate downstream petroleum pricing. These regulations mainly control the various operational issues concerning health, safety and the environment, as well as fuel specifications, which are enforced through the MME’s Petroleum Inspectorate.

3.3.2 Security of Fuel Supply

Namibia is highly dependent on the importation of liquid fuels and other petroleum products, and consumes approximately one billion litres annually. Such imported fuel is relied on and used daily in many ways: for various modes of transport, in the mining and manufacturing sectors, for the generation of electricity, for heating, cooking and lighting, and others.

Namibia’s ongoing dependence on fuel imports, and the limited availability of strategic storage facilities, constitute a security of supply challenge and remains of national strategic importance. Various private sector companies and NAMCOR are involved in fuel importation and storage.

Issues:

1. All liquid fuels are imported, and these are marketed and distributed by private sector firms
2. In 2016, Namibia has a fuel storage capacity of 15 days, and the new bulk storage facility currently built at Walvis Bay will increase it to 75 days
3. It is important to diversify the current fuel supply arrangements, including the possible reinstatement of NAMCOR’s 50% mandate to supply fuel.

Policy Objective: To ensure the secure and reliable supply of liquid fuels and other petroleum products for the domestic market.

Policy Statements P15 Security of Fuel Supply

Government resolves to:

P15.a promote the diversification of fuel supply sources

P15.b ensure that Namibia has strategic liquid fuels stocks for at least 90 days

P15.c ensure the allocation of financial resources to meet national strategic petroleum stock requirements through a fund

P15.d facilitate the development of a broad supply base for petroleum products, to strengthen competition in the downstream sector

P15.e empower and capacitate NAMCOR to play a meaningful role in the strategic importation, storage, marketing and distribution of liquid fuels and petroleum products

P15.f consider alternative types of fuels to enhance the country's security of fuel supply.

3.3.3 Access to Petroleum Products

Access to and distribution of petroleum products in Namibia is satisfactory, but must be improved as population centres grow.

Accessibility, distribution and pricing of fuel should not disadvantage rural customers, nor should these factors inhibit rural development. In this regard, the National Energy Fund (NEF) subsidises the transportation of fuel to rural and outlying areas, to ensure the partial equalisation of fuel prices.

Issues:

1. In rural Namibia, access to affordable liquid fuels and gas remains a challenge
2. Namibia remains highly dependent on suitable fuels for the transport sector
3. The number of and distribution of liquid fuel outlets is inadequate.

Policy Objective: To increase access and to extend the reach of petroleum products across Namibia.

Policy Statements P16 Access to Petroleum Products

Government resolves to:

P16.a facilitate the expansion of petroleum products storage capacities and retail outlets countrywide

P16.b extend the bulk distribution infrastructure for petroleum products, including installations, depots and pipelines

P16.c support the expansion of the supply and reach of petroleum products across the country.

3.3.4 Expansion of Petroleum-related Infrastructure

Sufficient and efficient petroleum-related infrastructure (petrol stations, storage tanks, terminals, depots, pipelines) is key to ensure the adequate, reliable and cost-effective supply of petroleum products across Namibia. Most of the existing supply infrastructure has not been expanded in years, although supply and market requirements have changed significantly. The expansion and modernisation of Namibia's petroleum-related infrastructure is therefore necessary. Recently, progress has been made in upgrading and extending the country's strategic liquid fuel storage facilities at Walvis Bay. The role of NAMCOR and private sector involvement remains essential to ensure that the necessary infrastructure and associated capabilities are in place.

Issues:

1. Investments in the country's petroleum-related supply infrastructure remain inadequate
2. Infrastructure for the storage of petroleum products is limited, and Government remains reliant on the private oil industry for storage at the coast
3. Road transport remains the primary transportation mode to distribute liquid fuel products
4. Petroleum infrastructure projects are capital intensive.

Policy Objective: To secure investments in the country's petroleum-related infrastructure.

Policy Statements P17 Expansion of Petroleum-related Infrastructure

Government resolves to:

P17.a facilitate public and private sector investments to expand petroleum-related infrastructure

P17.b enhance the fuel supply chain by promoting the use of rail to transport petroleum products.

3.3.5 Refinery and Petrochemicals Hub

To address the security of supply for Namibia, as well as for other countries in the region, Government will consider the construction of an oil refinery, provided such a project is economically viable. Important synergies between refining and related petrochemical activities are possible. A refinery can convert crude oil into diesel, jet fuel and gasoline, and a petrochemical factory can produce plastics, lubricating oil and numerous other oil-related products. Namibia's export-orientated trade policy makes coastal locations, such as Walvis Bay or Lüderitz, attractive for such investments. Prospective investors are viewing such investments in a regional context, which is encouraged by Government.

Namibia can take advantage of the strategic location of Walvis Bay as a regional gateway for international trade between SADC countries and the rest of the world. In this respect, the port is linked to Namibia's air, rail and road network. It is also an attractive alternative to other ports in southern Africa, which often operate at a maximum and face congestion challenges.

A refinery would afford Namibia the opportunity to supply the local market, including landlocked neighbouring countries, with petroleum products. The creation of a refining and petrochemicals hub

would strengthen the economy, ensure fuel security by minimising dependency on external suppliers, and contribute to job creation and industrialisation of the country.

Regional cooperation approaches to meeting this need in other countries can yield benefits for Namibia and its neighbours. This undertaking compliments the objectives of the SADC Energy Protocol 1998, which includes promoting the joint development and establishment of refining and storage facilities, ensuring security and reliability of energy supply and minimisation of costs, and promoting joint procurement of petroleum products to take advantage of economies of scale.

Issues:

1. The absence of a local crude oil refinery and reliance on international sources for fuel is a risk to national fuel security
2. A refinery is capital-intensive and requires a highly skilled workforce
3. Product specifications must meet international standards to be competitive
4. A local refinery necessitates the security of supply of crude oil, reliable power supplies, and adequate petroleum evacuation infrastructure which includes pipelines and terminals
5. Volatile international oil prices remain a national and regional challenge
6. A Namibian refinery and petrochemicals hub necessitates strong regional and international cooperation.

Policy Objective: To promote the development of a local refinery and petrochemicals hub.

Policy Statements P18 Refinery and Petrochemicals Hub

Government resolves to:

- P18.a guide and facilitate the viability assessment and development of a local refinery and petrochemicals hub
- P18.b facilitate investments in a refinery and petrochemicals hub, if viable
- P18.c engage with SADC member countries and other off-takers willing to commit to such a project
- P18.d engage with interested crude oil suppliers and oil-producing countries to secure a reliable supply of crude oil
- P18.e promote Namibia as a gateway for the supply of liquid fuels to the SADC market.

3.3.6 Fuel Efficiency

The downstream liquid fuels sector, which includes petrol, diesel, and related liquid petroleum products, accounts for some 63% of Namibia's total annual energy consumption. Due to the geographical location and vast distances between population centres, the road transport sector is the most important user of liquid petroleum products, followed by rail and sea transport. The second largest oil-consuming sectors include the fishing and other industries. Namibia consumes approximately one billion litres of automotive fuels per year. Increased petroleum use has direct and

indirect implications for the total energy consumption and socio-economic growth potential of the country. The sector's existing challenge is how to ensure efficient use of petroleum products, which is determined by the quality of transport systems, the standard of vehicles used, fuel efficiency standards, and the mode of transport.

Issues:

1. Various sectors are using liquid petroleum fuels; however, the road transport sector is the single largest user of such fuels, followed by the rail, sea and aviation sectors
2. Fuel efficiency in various sectors, including the transport, fishing, mining, aviation and manufacturing sector, is important.

Policy Objective: To promote fuel efficiency across the economy.

Policy Statements P19 Fuel Efficiency

Government resolves to:

P19.a ensure the establishment of regulatory frameworks for the application of fuel efficiency

P19.b promote fuel efficiency standards across all relevant sectors

P19.c create awareness of the benefits of fuel efficiency of all stakeholders.

3.3.7 Petroleum Pricing

MME controls the prices of diesel and petrol. Retail prices of all petrol grades are gazetted, and diesel prices are controlled at a wholesale level while not being gazetted. The Petroleum Products and Energy Act of 1990 (as amended) allows the MME to regulate the sale of petroleum products (import, supply, storage and possession). As from 1 January 1997, a new fuel pricing mechanism of quarterly price adjustment was introduced in the country, which was an effort to eliminate the subsidies under NEF. Essentially there is one fuel price countrywide, which is a Walvis Bay price, to which the first cause to deliver the product by rail to the inland depots is added. Then added is the road delivery from the depots to the respective destinations in remote areas.

The petroleum supplies market in the SADC Region has undergone a significant transformation. South Africa used to be a net exporter to the Region, but has now become a net importer. This change influences the petroleum-pricing regime in Namibia, and is a challenge to the country which remains a net importer of fuel supplies.

Issues:

1. Retail prices of all petrol fuel grades are gazetted, and controlled by Government
2. Diesel prices are controlled at wholesale level, and are not gazetted
3. The prices of other petroleum products are determined by market forces alone
4. The current pricing mechanism, i.e. the Basic Fuels Price (BFP), needs to be revised and aligned to market best practice

5. The replacement of international oil companies by international oil marketing companies/fuel trading companies in the sourcing of fuels has changed the basis of petroleum pricing
6. Government through the NEF provides fuel subsidies to remote areas
7. Local petroleum trading and pricing skills and experience remains limited.

Policy Objective: To ensure that the pricing of petroleum products reflects prevailing market conditions.

Policy Statements P20 Petroleum Pricing

Government resolves to:

P20.a ensure that the pricing of petroleum products recovers all relevant costs

P20.b maintain a transparent and consistent price regime for petroleum products

P20.c maintain uniform national prices for petroleum products.

3.3.8 Market Growth and Development

Even though NAMCOR plays an increasing role in the country's downstream sector, Namibia's liquid fuels are mainly supplied by a few private players. Opportunities exist to develop the Port of Walvis Bay as a gateway for the supply of liquid petroleum products to regional markets.

Issues:

1. Namibia's retail market is dominated by a small number of large private-sector companies selling similar products, presenting a challenge to new entrants wishing to access this market
2. Local content and participation in the downstream industry is limited
3. Namibia remains a net importer of petroleum products
4. Walvis Bay can serve as a supply gateway for petroleum products to the SADC Region.

Policy Objective: To grow and develop Namibia's downstream oil and gas market.

Policy Statements P21 Market Growth and Development

Government resolves to:

P21.a facilitate the development of local content and participation throughout the downstream sector

P21.b promote the entry of local suppliers to the market based on fairness, transparency and competition

P21.c facilitate the development and strengthening of operational guidelines and standards for health, safety and the environment, in accordance international best practices

P21.d ensure that capacity building efforts enhance the national petroleum trading, pricing, and other relevant skills necessary for the development of the sector

P21.e promote and attract investments to develop the country's downstream gas sector

P21.f establish a consolidated fund to pool resources to provide capital funding for projects in the downstream oil and gas sector.

3.4 Downstream Gas Sector

3.4.1 Introduction

Namibia has proven and commercially viable gas reserves, but lacks a well-developed domestic gas market. However, even though a local and regional market exists for liquid petroleum gas, a local gas industry capable of developing and marketing Namibian gas does not exist.

3.4.2 Development, Commercialisation and Use of Natural Gas

The Kudu Gas Field in the Orange Basin was discovered in 1974, and it is estimated to hold 1.3 trillion cubic feet of proven reserves. It remains the largest commercial hydrocarbon discovery in the country, and has the potential to provide secure, clean and reliable power supplies to Namibia and the southern African region. Therefore, Government has identified the Kudu Gas-to-Power Project as a strategic project to develop Namibia's economy.

Issues:

1. The Kudu Gas Field is yet to be developed, and will require considerable investments to support a local supply chain, including upstream, midstream and downstream infrastructure
2. The development of dispatchable power stations using local natural gas supplies would strengthen Namibia's energy security, and create electricity export opportunities
3. Gas-related infrastructure, such as liquefied natural gas (LNG) facilities, does not yet exist
4. A regulatory framework for the use of local gas resources remains to be established
5. Namibia's local gas industry is under-developed, and the viability of a local market has not been assessed in detail.

Policy Objective: To develop, commercialise and utilise the country's gas resources.

Policy Statements P22

Development, Commercialisation and Use of Natural Gas

Government resolves to:

- P22.a ensure that the upstream and downstream components of the country's gas developments are integrated and harmonised
- P22.b support and facilitate the development of Namibia's gas resources through relevant partnerships between NAMCOR, NamPower, and other key investor partners
- P22.c encourage the development of a viable domestic petrochemical industry from local gas resources with a view to export such products to the region
- P22.d encourage the private sector to establish the necessary infrastructure for the commercialisation and use of Namibia's gas resources
- P22.e promote and attract investments to develop the country's downstream gas sector
- P22.f support targeted research, development and innovation initiatives to commercialise and use Namibia's natural gas resources.

3.4.3 Legal and Regulatory Framework for a Local Gas Market

An effective legal and regulatory framework is required for the establishment of a local gas market. The legal and regulatory framework should address the security of supply of gas to the local market, establishment of a regulatory authority, and the development of appropriate standards based on international best practice. In addition, the framework should also address the necessary regulatory aspects dealing with the rights and obligations of all stakeholders in the sector, and stimulate the development of a competitive local gas market.

Issues:

1. A legal and regulatory framework for a local downstream gas market does not exist
2. A regulatory authority responsible for the local gas market does not exist
3. The local gas industry remains under-developed.

Policy Objective: To establish a legal and regulatory framework for the local gas market.

Policy Statements P23 Legal and Regulatory Framework for a Local Gas Market

Government resolves to:

- P23.a facilitate the development of a legal and regulatory framework for the local gas market
- P23.b ensure that the legal framework promotes investment, fairness, transparency and competition.

3.4.4 Cooperation and Trade with SADC Countries

An established local gas industry will enable the export of gas to the regional market, which requires further cooperation and trade with other SADC countries. A Bilateral Gas Trade Agreement was signed between Namibia and South Africa in 2003, to facilitate the trade of gas between the two countries. The agreement was based on the realisation that the development of an open and competitive environment for the exploration and development of natural gas reserves, and the production and supply of natural gas, would be beneficial for both countries.

Issues:

1. There continues to be a potential for further cooperation and trade with South Africa, supported by bilateral discussions on gas developments between the two countries
2. Studies show that South Africa's Western Cape region offers multiple opportunities
3. Several options on how to export gas by pipeline to South Africa have been investigated, but similar studies on further trade with other SADC countries are lacking
4. The SADC region offers promising opportunities for the export of natural gas, and it is therefore important to intensify cooperation and trade with these countries.

Policy Objective: To promote cooperation and trade related to Namibian gas with SADC countries.

Policy Statements P24 Cooperation and Trade with SADC Countries

Government resolves to:

P24.a ensure that the legal framework governing Namibia's natural gas resources fosters effective cooperation and trade with the country's neighbours

P24.b facilitate the cooperation and trade of natural gas with SADC countries.

3.5 Thermal Energy Sector

3.5.1 Introduction

Namibia's thermal energy sector is in its infancy. This sector has few direct regulatory provisions, and past policies have only paid peripheral attention to this fledgling sector. In part, this is the result of the close historical link to, and dependence on, the electricity sector. Yet, as the efficient use of electricity is mainstreamed and the country's economy and industrial base diversifies, dedicated thermal energy applications are bound to become more important in future.

In 2016, more than 50% of the country's population continued to rely on the daily use of woody biomass as a source of thermal energy, mainly for cooking food and preparing hot water. The clear majority of rural Namibians, and an estimated 20% of the population residing in urban and peri-urban centres, depend directly on the regular use of woody biomass, or its derivative products. In addition, select commercial and industrial users have begun to switch some of their thermal energy supplies from electricity, heavy fuel oil or coal to locally harvested woody biomass. And furthermore, because of improving life-cycle economics and greater awareness, solar thermal water heaters are increasingly used to supply hot water, both in domestic and commercial settings.

Yet, the country's thermal energy sector is neither well-defined, nor is there any clarity on the future roles and responsibilities of the sector's main actors. However, as the Electricity Control Board is transformed into the National Energy Regulatory Authority, and as domestic, commercial and industrial requirements change, it is likely that the country's thermal energy sector will expand and mature. It is therefore the Government's ambition to create the necessary framework conditions to assist the sector in its formation and development, so that it can play a more pronounced role in the overall development of the country's energy sector.

It is noted that the sections below include important applications in the thermal as well as the electrical energy sectors, as thermal energy sources are increasingly used in both.

3.5.2 Bioenergy for Thermal and Electrical Applications

Namibia is richly endowed with a variety of bioenergy resources, including solid woody biomass, as well as different sources of organic matter, including municipal solid waste, as well as their many derivative products. As a primary feedstock, bioenergy resources can be turned into other energy carriers, such as wood chips, pellets, biogas and biofuels, to name but a few.

Amongst the most significant sources of Namibian bioenergy is the country's woody biomass resource, which mainly exists in form of encroacher bush. Even though this resource is often viewed as a nuisance, its sustainable use can become a valuable contributor to the country's socio-economic development efforts, and a major value driver in rural Namibia. However, to date, the use of the country's bioenergy resources in general, and the abundant biomass resources in particular, remains limited and mostly occurs in a non-systematic manner.

In 2016, biomass in the form of fuel-wood continues to meet the thermal needs of the majority of Namibian households, and therefore remains critically important as a daily source of energy in the country's domestic sector. In addition, a Namibian charcoal industry exists, producing tens of thousands of tons of produce per year, most of which is exported.

In future, locally harvested woody biomass from encroacher bush is likely to play a more pronounced role in Namibia's supply of thermal and electrical energy, and possibly even liquid fuels. The rapid advancement of technologies, such as combined heat and power plants and electricity generation plant powered by biomass, as well as specific thermal energy uses are expected to invigorate the development of the local biomass industry. Such developments however make it necessary that local biomass harvesting and utilisation practices are guided by sustainable land-use practices to minimise the industry's overall carbon footprint.

Issues:

1. Although biomass contributes an estimated 20% to the country's total annual energy-use, a consistent future-oriented framework for the development of the sector does not exist
2. The absence of policies that are specifically aimed at promoting the sustainable use of local biomass resources for thermal and electrical applications has limited the development of the sector
3. The development of a local biomass industry, to provide for thermal applications and electricity generation, can potentially unlock the economic potential of often unproductive bush-encroached land, as well as sustainably managed forests.

Policy Objective: To develop the country's bioenergy resources.

Policy Statements P25 Bioenergy for Thermal and Electrical Applications

Government resolves to:

- P25.a guide the development, productive and sustainable use of the country's bioenergy resources
- P25.b incentivise investments in the establishment of a local sustainable bioenergy sector, including the commercial and industrial use
- P25.c promote the efficient use of biomass for thermal applications in households
- P25.d promote investments required to support the sustainable development of value chains benefitting from Namibia's encroacher bush resource
- P25.e support research, development and innovation initiatives aimed at the productive use of Namibia's bioenergy resources.

3.5.3 Solar Thermal Applications

Many solar thermal technologies for domestic, commercial and industrial applications offer favourable life-cycle costs, are user-friendly, and are often environmentally benign. In addition, most locations in Namibia therefore offer abundant potentials for their further application and use.

Examples of contemporary solar thermal technologies that have successfully reached the market include solar thermal water heaters and related thermal heating solutions that can readily replace electric water heaters. These contemporary technologies contribute to reducing the electricity demand of end-users, they create long-term private and national savings, and they reduce the environmental impact resulting from the use of electric water heaters.

Issues:

1. Namibia is endowed with one of the best solar resources in the world
2. Despite the abundance of Namibia's solar thermal resource, efforts to convert and create national benefits from it remain limited and largely non-systematic
3. Many solar thermal applications, such as solar water heaters, are mature, well-developed, and cost-competitive technologies that are characterised by favourable life-cycle costs.

Policy Objective: To enhance the uptake and use of solar thermal technologies across the country.

Policy Statements P26 Solar Thermal Applications

Government resolves to:

- P26.a guide the steady displacement of inefficient electric and other thermal technologies and appliances by solar thermal technologies
- P26.b ensure that the necessary legal, regulatory and technical instruments are established to mainstream solar thermal technologies
- P26.c incentivise the phase-out of electric water heaters and replacement with solar thermal technologies
- P26.d promote the development of local assembly and/or manufacturing of solar thermal technologies
- P26.e support targeted research, development and innovation initiatives that promote local manufacturing and the use of solar thermal technologies and related applications.

3.5.4 Geothermal Applications

Namibia offers some potential for the development of its geothermal resources. Should the abundance of this resource allow, geothermal resources could provide both thermal and electrical energy in future. However, to date, the scale and scope of Namibia's geothermal potential remains largely un-quantified, and no development has yet taken place.

Regional experiences with the development of geothermal energy resources point to a variety of challenges, including the considerable upfront investment requirements, long lead times between the quantification of the resources and their ultimate use, and others. Despite such hindrances, geothermal energy resources constitute a clean and renewable energy resource that may become beneficial, provided the framework conditions create certainty with regards to the actual resource potential, and that investments and development is incentivised.

Issues:

1. Namibia's actual geothermal energy resource base remains largely unknown
2. In the absence of policies that incentivise the systematic exploration and development of the country's geothermal resources, this sector remains dormant.

Policy Objective: To assess Namibia's geothermal energy potential with a view to unlock this resource.

Policy Statements P27 Geothermal Applications

Government resolves to:

- P27.a initiate the assessment of the country's geothermal energy potential
- P27.b establish the legal, regulatory and technical instruments necessary to initiate the full quantification and commercial development of the country's geothermal resources, provided their commercial viability has been demonstrated.

3.5.5 Thermal Energy Applications

Government recognises that framework conditions to unlock the country's thermal energy ambitions do not, as yet, exist. Such conditions would include provisions for the preparation of hot water and the associated market for hot water products and technologies, the potential and development of the local thermal industry, standardisation, awareness, research, training, and regulation.

Issues:

1. Numerous domestic, commercial, and industrial applications use energy sources or fuels that are less efficient, or have a more significant environmental footprint, or are less economically favourable than the corresponding thermal technology alternatives
2. Thermal energy end-users are often unaware of the long-term costs and benefits of contemporary thermal energy applications.

Policy Objective: To foster the application of thermal energy technologies as part of the country's efforts towards the efficient and effective use of energy.

Policy Statements P28 Thermal Energy Applications

Government resolves to:

- P28.a promote the broad uptake of modern thermal energy technologies in households, commerce, industry and Government to replace inefficient electric and other appliances
- P28.b ensure the development of legal, regulatory and technical instruments necessary to advance the application of thermal energy applications
- P28.c promote the local assembly and/or manufacturing of thermal energy appliances
- P28.d support targeted research, development and innovation initiatives to promote local manufacturing and use of thermal energy technologies.

3.6 Cross-Cutting Themes

3.6.1 Rural and Urban Household Access to Energy

Government recognises that access to modern energy is a key overarching developmental objective, and essential for its multitude of efforts to positively influence the social and economic advancement of all Namibians. Since Namibia's independence in 1990, Government has made considerable investments in rural electrification. The main emphasis of this programme has been the provision of grid extensions to serve rural infrastructure owned and operated by Government, including schools, hospitals and clinics, and Government offices.

Despite sizeable investments over more than two decades, access to grid electricity in rural areas remains at some 15%, as indicated in the 2011 National Population and Housing Census. A study undertaken in 2015 highlighted the need for a household electrification policy and electrification plan to improve access to electricity or other modern forms of energy. By using such an approach, off-grid technologies, including mini-grid and stand-alone systems, would offer significant scope in mainstreaming access to modern energy. Operation and maintenance of existing off-grid power plants (mini-grids and container systems) have proven challenging, as public owners have lacked sufficient incentives and capacity to manage them efficiently and sustainably.

The health and safety issues associated with the indoor use of energy sources, such as paraffin appliances, candles and wood fuel, are well-documented. In Namibia, the use of these more traditional energy sources has led to many incidents and accidents, and has caused respiratory and other health issues. These invariably affect the poorest section of society, as well as those living in rural Namibia. Consequently, the provision of access to modern energy is a key factor which is expected to significantly reduce, or even eliminate, the above risks.

Besides providing energy for the upliftment of rural households, another important objective of providing energy is to enable individuals to engage in economic activities that use energy. At the same time, it is evident that the improvement of access to energy is not yet sufficient to completely transform rural Namibia and, furthermore, improving access needs to be accompanied by other development initiatives.

Issues:

1. Access to electricity and other energy services remains very low in rural Namibia
2. There is a considerable and growing backlog of energy supplies (including the provision of electricity connections) to households in informal areas within local authority jurisdictions
3. As conventional electrification (access to grid infrastructure) is becoming increasingly expensive, it is unlikely to offer an economical option of providing access to energy for most unserved Namibians
4. Off-grid energy supplies have not been systematically embraced, nor is there an action plan on how to create broad access to modern energy services using off-grid technologies
5. Existing off-grid electricity supply systems are not operating efficiently, and the current model for their operation is not sustainable
6. Private sector investments and involvement in rural energy provision in general, and rural electrification are minimal

7. The health and safety risks associated with the indoor use of energy sources, such as paraffin, candles and wood fuel, has led to respiratory and other health problems amongst the poor and rural parts of the population
8. Often, rural and low income communities are passive recipients of energy access projects and, generally, they do not get the opportunity to shape or participate in such projects, nor benefit economically from them.

Policy Objective: To create universal access to at least one type of modern energy service including a form of electrical service for all Namibian households.

Policy Statements P29 Rural and Urban Household Access to Energy

Government resolves to:

- P29.a create access to at least one type of electrical service for all Namibian households, complemented by relevant modern thermal energy services
- P29.b increase investments to provide modern energy services to rural and unserved urban households
- P29.c embrace off-grid and non-electrical means to attain energy access goals as an acceptable alternative to grid electrification
- P29.d ensure the development of an institutional framework for off-grid electricity and non-electricity energy services
- P29.e guide the development and implementation of a legal, regulatory, and technical framework to encourage community and private engagement in the provision of off-grid energy services
- P29.f encourage the adoption and productive use of efficient modern energy service options to improve the affordability of such services.

3.6.2 Rural Institutional and Commercial Access to Energy

Government is cognisant of the pivotal role played by its offices in rural Namibia, as well as the role of private sector business operators, and views the provision of modern energy services to these transformational entities and agents as an essential requirement for the country's development. In addition, it is recognised that local decentralised service provision and economic activities could significantly reduce people's motivation to migrate to urban areas.

Issues:

1. Many rural Government institutions and offices remain without suitable access to essential energy services, thus reducing their effectiveness
2. Businesses in un-electrified areas, and those without access to other forms of modern energy, are unable to contribute effectively to the development of the country
3. A lack of access to suitable modern energy for rural businesses hinders the entry of rural people into commercial pursuits, thus limiting their participation in the country's economy.

Policy Objective: To enhance access to suitable energy services for rural institutions and businesses through a combination of grid and off-grid energisation measures.

Policy Statements P30 Rural Institutional and Commercial Access to Energy

Government resolves to:

P30.a sustain investments to provide modern energy services to rural institutions and businesses

P30.b create opportunities for businesses in rural areas to play a role in rural energy provision

P30.c promote the inclusion of energy service provision in rural development planning to maximise their economic benefit.

3.6.3 Environmental Considerations

The ever-present use of energy resources is associated with a multitude of negative environmental impacts. These include, amongst others, the use of scarce water resources, atmospheric emissions of particulates known to adversely affect human health, emissions of greenhouse gases and other environmental pollutants, as well as non-sustainable land-use practices. National development should therefore favour energy technologies and practices that minimise any adverse environmental impacts, while creating conditions in which economic growth and environmental degradation are actively de-linked.

Prudent environmental management in the energy sector is the key to ensuring sustainability throughout the energy value chain. Energy and petroleum production, transportation, and use pose various risks to human life and the environment. The challenge for players in the energy sector is providing affordable, competitive, reliable, and sustainable energy and petroleum products while, at the same time, ensuring that environmental impacts remain minimal.

Issues:

1. Exploration, production, and use of energy resources often have significant impacts on the natural environment
2. Adverse environmental effects because of the use of various forms of energy are best minimised during the design and planning stage, and need to be monitored
3. As development has environmental costs and benefits, it remains critically important that adverse environmental impacts are, and remain, minimal for all activities undertaken in the country's energy sector.

Policy Objective: To limit the adverse impacts of Namibia's energy sector on the natural environment.

Policy Statements P31 Environmental Considerations

Government resolves to:

P31.a manage adverse environmental impacts in the energy sector in collaboration with relevant other ministries

P31.b promote investments in environmentally friendly energy technologies and practices

- P31.c foster a culture of environmental stewardship throughout the energy sector
- P31.d develop capacity to deal with environmental risks associated with the energy sector
- P31.e support research, development, and innovation of nationally appropriate energy technologies and practices
- P31.f guide the development of appropriate rehabilitation and disposal practices throughout the energy sector
- P31.g annually report on the environmental impacts and mitigation measures relevant to and applied in the country's energy sector.

3.6.4 Energy as an Integral Part of National Development Planning

Energy is a key requirement for the socio-economic development of any economy. The need to integrate energy planning with economic, social, and environmental policies is therefore of vital importance. In the past, the lack of integrated energy planning has led to occasional disruptions and shortages in the liquid fuel supply, and could still lead to power rationing and power interruptions. In addition, it has led to conflicting and competing interests between various subsectors of the economy, especially between those responsible for the development and use of energy resources.

Issues:

1. Improving integration of planning efforts is expected to reduce costs, unlock opportunities, and improve co-ordination in service delivery
2. National housing development initiatives have a services component, including energy, but it has so far not been integrated into the planning and budgeting process for the provision of housing, leaving many new houses without services
3. Urban planning often does not integrate energy issues
4. It is expected that there are many opportunities to conserve energy by using an energy aware approach to urban planning, for example, the reduction of transport distances
5. There continues to exist inadequate structures and systems for integrated energy planning and monitoring of the implementation of projects
6. Capacities to carry out integrated energy planning remain limited
7. Reliable data on energy consumption and use is still lacking
8. There are inadequate links between energy planning and development initiatives taking place in other sectors of the economy.

Policy Objective: To integrate energy planning into all national development planning activities throughout all tiers of Government.

Policy Statements P32 Energy as an Integral Part of National Development Planning

Government resolves to:

- P32.a facilitate the formal integration of energy-related aspects in the planning, monitoring and evaluation of national development projects
- P32.b develop adequate capacity to carry out and support integrated national energy planning.

3.6.5 Energy Resource and Consumption Data and Information

In the electricity sector, there are various energy resources that could be developed and utilised with lower risk if better resource data is made available for planning and use by potential investors. For example, comprehensive wind data assessments would support investments in wind generation, geothermal resource data would facilitate investments in geothermal electricity generation, and the development of accurate biomass resource data is essential to unlock this sector.

Although the quality and reliability of national electricity statistics is considered reasonable, there is very little information available on long-term trends of individual consumer behaviours, consumer load patterns, appliance use, and other data required for planning, forecasting, and targeting of interventions ranging from tariff design to energy efficiency measures.

Several entities have been collecting energy-related data in the past, including the National Statistics Agency, these initiatives remain mostly insular and non-systematic. In future, various public and private sector entities are likely to play a role in consolidating the country's energy-related data, to the benefit of all.

Issues:

1. The lack of publicly accessible and credible energy resource data, including, for example, wind resource data, solar irradiation data, and biomass and geothermal resource data, of a standard that can be used to support bankable energy projects, hinders the development of local energy resources
2. There is a lack of comprehensive and accurate energy consumption data in the electricity, liquid fuels, downstream gas, and thermal sectors
3. The lack of reliable baseline data for projections and target setting hinders research, effective national planning and policy making efforts
4. Systematic and quality-assured energy-related resource and consumption data remains largely unavailable.

Policy Objective: To develop and maintain a comprehensive, quality-assured, and credible database of energy resource and consumption data for Namibia.

Policy Statements P33 Energy Resource and Consumption Data and Information

Government resolves to:

- P33.a collect and avail national energy resource and consumption data and information through the appointment of a national energy data custodian
- P33.b mandate the national energy data custodian to annually compile a State of Energy report
- P33.c mandate the national energy data custodian, through appropriate legal provisions, to collect relevant energy resource data from stakeholders, without compromising any commercially sensitive and/or competitive business information
- P33.d ensure the ongoing improvement and regular maintenance of national energy resource and consumption data and associated statistics.

3.6.6 Transparency and Good Governance

Governance refers to the process of making and implementing decisions. Characteristics of good governance include accountability, participatory inclusion, effective and efficient processes, equitability and inclusiveness, consensus-oriented, and following the rule of law. In the context of this section, good governance refers to transparency and accountability, which have become essential requirements in the energy sectors of most countries across the world.

Namibia's well-endowed mineral and energy resources remain highly attractive to many local and international investors. The energy sector therefore requires careful vigilance in terms of transparency and good governance, to avoid the many common pitfalls that are evident in energy-producing countries. Symptoms of the absence of transparency and good governance include corruption, abuse of power, mismanagement of resources, ineffective regulation, lack of effective implementation, internal conflicts over ownership and control of resources, and a variety of social and environmental issues.

Two key entities have recently been created in Namibia, tasked to promote transparency and good governance throughout the country's economic sector: The Anti-Corruption Commission, which is an independent agency established by an Act of Parliament to combat and prevent corruption in Namibia; and the Ministry of Public Enterprises, which operates a number of programmes to align, integrate, and oversee the functions and responsibilities of most parastatals, and to ensure that synergies can be realised between state-owned companies. To address the above-mentioned concerns and challenges in the overall development of the country's energy sector, additional focus on good governance and transparency is necessary.

Issues:

1. There is considerable evidence in energy-producing countries that highlights that transparency and good governance challenges continue to exist
2. The energy (including oil and gas) sector is highly capital-intensive, requiring large investments and effective cooperation and collaboration between Government and industry players
3. Investors require clear and transparent rules to ensure the protection of their investment and continuity of their long-term contracts
4. The sector requires robust and good governance within an effective legal and regulatory framework that is administered and managed by competent and professional officials
5. Transparency and good governance in the energy sector require effective cooperation and collaboration between Government ministries and agencies, industry players, and other stakeholders.

Policy Objective: To ensure transparency and good governance throughout the energy sector.

Policy Statements P34 Transparency and Good Governance

Government resolves to:

- P34.a provide for effective transparency, accountability and good governance requirements in all laws relating to the energy sector
- P34.b ensure transparency and good governance in all interactions between stakeholders in the energy sector, considering best industry practices.

3.6.7 Economic Empowerment

The rationale for economic empowerment, which is embedded in the Namibian Constitution, stems from the systematic marginalisation and exclusion of most the Namibian people from the economic mainstream during the apartheid era. Economic empowerment aims to redress these past inequalities, to redistribute wealth, and to promote the participation of the previously disadvantaged people in the economy, and it refers specifically to ownership, management, skills development, and enterprise development.

While the energy sector has sought to empower previously disadvantaged Namibians, it has mostly benefited a small number of individuals. In other cases, international investors have been disincentivised because of their intended Namibian partners not having access to the required investment capital, thus making projects more expensive.

Issues:

1. Economic empowerment in large-scale energy projects often enriches only a select few previously disadvantaged individuals, resulting in little or no benefit to the wider community and country
2. The existing market structure and its intrinsic limitations, as well as the high cost of entry, often make it difficult to attract new players for participation on an equal economic footing in the energy sector
3. The energy sector includes several high-risk activities, including oil and gas exploration, that are capital-intensive and, consequently, do not lend themselves to empowerment targeting
4. A lack of access to investment capital is a challenge for most new entrants in the energy sector
5. Nurtured and developed micro, small and medium enterprises can contribute to the structural transformation of the Namibian economy through the development of industries and value chains.

Policy Objective: To enhance the broad-based economic participation of previously disadvantaged Namibians across the energy sector to contribute to poverty eradication and reduction of inequality.

Policy Statements P35 Economic Empowerment

Government resolves to:

- P35.a promote the participation of previously disadvantaged Namibians across the energy sector
- P35.b facilitate access to finance for previously disadvantaged Namibians to participate in the energy sector
- P35.c provide incentives for the private sector to advance broad-based economic empowerment throughout the energy sector
- P35.d empower rural and local communities, cooperatives, and micro, small and medium enterprises by enabling their access to economic activities, infrastructure, ownership, and skills.

3.6.8 Mainstreaming Gender, Youth, and Persons with Disabilities

Energy consumption is universal. At the same time, women play a vital role in the provision of energy resources, especially in domestic settings in rural Namibia. As woody biomass constitutes the main energy resource used for cooking and heating in rural and informal urban households, women are often disproportionately affected by the adverse health impacts of its polluting emissions. In contrast, if there was access to modern energy, the time used to fetch firewood could be spent on other economic activities.

Issues:

1. The predominance of women involved in the collection and use of fuel-wood disadvantages them in terms of economic opportunities and exposes them to increased health risks
2. There continues to be limited involvement of women, youth, and persons with disabilities in the planning, management, and delivery of energy services
3. Government's gender balance aspirations in the energy sector have, as yet, not been met
4. The limited ability of specific groups of people to access and afford modern and clean energy affects their opportunity to meaningfully participate in the economy.

Policy Objective: To mainstream the participation of women, youth, and persons with disabilities in the energy sector.

Policy Statements P36 Mainstreaming Gender, Youth and Persons with Disabilities

Government resolves to:

- P36.a increase the participation of women, youth, and persons with disabilities throughout the energy sector
- P36.b promote gender equality and equity across the energy sector
- P36.c ensure participation of women, youth, and persons with disabilities in the formulation and implementation of energy interventions.

3.6.9 Capacity Development

The effective development of the energy sector in all its facets requires the availability of human resources. This will only be realised if the necessary educational and institutional capacity building efforts that cater for the current and future needs of the country's energy sector are undertaken.

Issues:

1. Many of the country's energy sector institutions experience a lack of skilled and experienced staff
2. The human resources development in the energy sector has not yet been mainstreamed
3. The existing institutional and skills framework does not sufficiently support off-grid and non-electricity means of household energy supply
4. Internships for persons having completed tertiary or vocational training remain difficult to find.

Policy Objective: To build local capacity in all disciplines needed in the country's energy sector.

Policy Statements P37 Capacity Development

Government resolves to:

- P37.a ensure appropriate and ongoing development of local capacity and skills to meet the needs of the energy sector
- P37.b leverage capacities in relevant local, regional and international institutions to develop and enhance the capacity of local institutions
- P37.c promote energy-related capacity building at all levels in the country's technical, vocational, and tertiary institutions
- P37.d encourage all entities active in the country's energy sector to contribute to energy-related capacity development of Namibians, including the provision of practical training opportunities
- P37.e support the training of Namibians in all fields of energy development, regulation and management.

3.6.10 Consumer Awareness

The efficient use of energy and energy conservation is, in many cases, a way of addressing energy supply issues at a lower cost than corresponding supply options, with the added benefit of cost saving for the consumer. Household consumers often do not have the necessary knowledge, finances or understanding to be able to make informed choices. Also, as prices of household electricity are below the cost of supply in most areas of Namibia, the incentive for households to save energy is thus reduced. This lack of awareness and incentives hampers significant opportunities to improve the energy supply position and cost, and it also causes consumers to spend more on energy than they would otherwise need to.

Issues:

1. Consumer awareness campaigns on the safe use of energy and energy efficiency have been undertaken in a haphazard manner, and many have not been sustained to achieve positive long-term outcomes
2. Consumer awareness of energy saving opportunities, energy efficiency options, and energy safety, as well as their response to information that has been provided, has not been properly assessed, providing little useful data for designing future energy awareness campaigns.

Policy Objective: To enhance consumer awareness of all relevant aspects related to energy.

Policy Statements P38 Consumer Awareness

Government resolves to:

- P38.a foster consumer awareness regarding energy matters, including consumer rights and duties
- P38.b ensure that consumer-facing energy sector actors regularly implement relevant consumer awareness programmes, including through regulatory provisions
- P38.c promote consumer health and safety awareness throughout all energy sectors.

3.6.11 Energy-related Research, Development and Innovation

Namibia has made progress in improving its research and innovation capacity, including through the establishment of the National Commission on Research, Science and Technology (NCRST), and the establishment of research units at the country's universities. In addition, research and innovation have been integrated into the functions of some Government ministries, e.g. the Ministry of Higher Education, Training and Innovation, the Ministry of Trade, Industrialisation and SME development, the Business and Intellectual Property Authority (BIPA), and others.

Research, development, and innovation are of critical importance for the development and progression of the energy sector. It is acknowledged that Namibia's research, development, and innovation activities are, as yet, at an infant stage. It is therefore important that such activities are systematically supported, and that national priorities focus on the disbursement of incentives to support such endeavours, irrespective of whether they are undertaken by tertiary education institutions, vocational training centres, or private sector actors.

Issues:

1. Few local research and development initiatives focusing on energy-related topics are taking place, thus limiting the potential scope and scale of local innovations that benefit the sector
2. Local support for research, development, and innovation remains largely non-systematic, which necessitate enabling framework conditions to incentivise such energy-related activities
3. Funding for research, development, and innovation remains inadequate.

Policy Objective: To foster local energy-related research, development, and innovation opportunities that address national priorities.

Policy Statements P39 Energy-related Research, Development and Innovation

Government resolves to:

- P39.a invest in energy-related research, development, and innovation activities that are of national relevance
- P39.b encourage energy sector actors to allocate resources to undertake energy-related research, development, and innovation
- P39.c facilitate and leverage relevant local, regional and international expertise in support of energy-related research, development, and innovation in collaboration with the National Commission on Research, Science and Technology and other relevant entities
- P39.d enhance linkages between Government, industry, academia, vocational training institutions, non-governmental organisations and other relevant actors to promote research, development, and innovation.

3.6.12 Regional and International Cooperation

Namibia's economy, in general, and the energy sector are essentially linked with the region and depend on global trade. Namibia continues to import all its oil products, and most of its electricity requirements. Government recognises that collaboration with regional and international partners is essential for the energy sector's development, and that it holds considerable opportunities.

Namibia has committed to several regional protocols and international agreements. As a SADC member, Namibia has adopted the SADC Protocol on Energy. The regional community has enacted several strategic plans for energy development, including the SADC Energy Cooperation Policy and Strategy in 1996, the SADC Energy Action Plan in 1997, the SADC Energy Activity Plan in 2000, and, most recently, the Regional Infrastructure Development Master Plan and its Energy Sector Plan in 2012. These plans present tangible objectives for SADC and its member states, specifically for infrastructure development in the energy sector and its subsectors, such as liquid fuels, natural gas, electricity, coal, renewable energy sources, as well as energy efficiency and conservation.

Issues:

1. Namibia stands to benefit from an increase in regional energy trade
2. By carefully considering its position with regards to regional energy trading opportunities, both for the import and export of energy, Namibia could develop those opportunities that are beneficial for the country's development
3. Significant international funding opportunities exist, specifically for the benefit of development initiatives in the energy sector, including, but not limited to, climate-related funding prospects arising from Namibia's ratification of the Paris Climate Agreement.

Policy Objective: To advance the Namibian energy sector through the development of regional and international opportunities.

Policy Statements P40 Regional and International Cooperation

Government resolves to:

- P40.a ensure that energy-related co-operation with other governments and international actors benefits Namibia
- P40.b support cross-border projects, infrastructure development, and investments with SADC, AU partner states and international actors to maximise the benefits which could accrue through such cooperation
- P40.c facilitate regional and international collaboration in energy-related education, research, and exchange of data and information.

4 Implementation Framework

This section describes the high-level framework within which the National Energy Policy will be implemented. An Implementation Action Plan has been prepared, and is issued as a separate document complementing this Policy.

4.1 Institutional Arrangements

Institution	Roles
Ministry of Mines and Energy	The MME has the primary responsibility for implementing the National Energy Policy. It may delegate activities to other institutions active in the energy sector, provided this is clearly communicated and appropriate resources are availed for such activities.
National Planning Commission	The NPC is overall responsible for managing and monitoring the implementation of government policy, and therefore exercises oversight over MME's implementation of this Policy.
Electricity Control Board	The ECB, as regulatory body, is responsible for the implementation of activities that fall within its regulatory mandate, in compliance with the provisions of this Policy. This includes the future mandates as envisaged once the ECB has been transformed into NERA.
Namibia Energy Institute	The NEI, as a Government agency, is responsible for the implementation of activities that fall within its designated mandate, including additional mandates that may be added through this and other policies.
NAMCOR	NAMCOR, as a Government agency, is responsible for the implementation of activities that fall within its designated mandate, including additional mandates that may be added through this and other policies.

Utilities, licensees and other energy sector participants are responsible for implementing those activities that they are tasked with under this and other policies, as and when mandated through legal and regulatory provisions that are enforceable on them.

4.2 Legal and Regulatory Provisions

The implementation of this Policy will commence within the existing legal and regulatory frameworks governing Namibia's energy sector. Of note are the finalisation and promulgation of the NERA and Electricity Bills, which are intended to update the legal and regulatory frameworks covering the electricity sector, and provide a legal basis for the regulation of other sectors, including the downstream gas sector, thermal energy sector, energy efficiency and demand side management. Additional laws will need to be promulgated to activate NERA's regulatory responsibilities and

functions in sectors other than the electricity sector. Preliminary provisions for such activation are included in the implementation action plan. The legal framework for upstream oil and gas is also under review and changes may be introduced in the licensing regime and other areas.

The envisaged future legal and regulatory framework, as illustrated in Figure 12 below, is preliminary in nature, and may change because of activities foreseen under this Policy. It should also be noted that the renewable and thermal energy sectors are expected to be regulated under the future provisions of the electricity sector, and will not necessarily fall under their own dedicated frameworks.

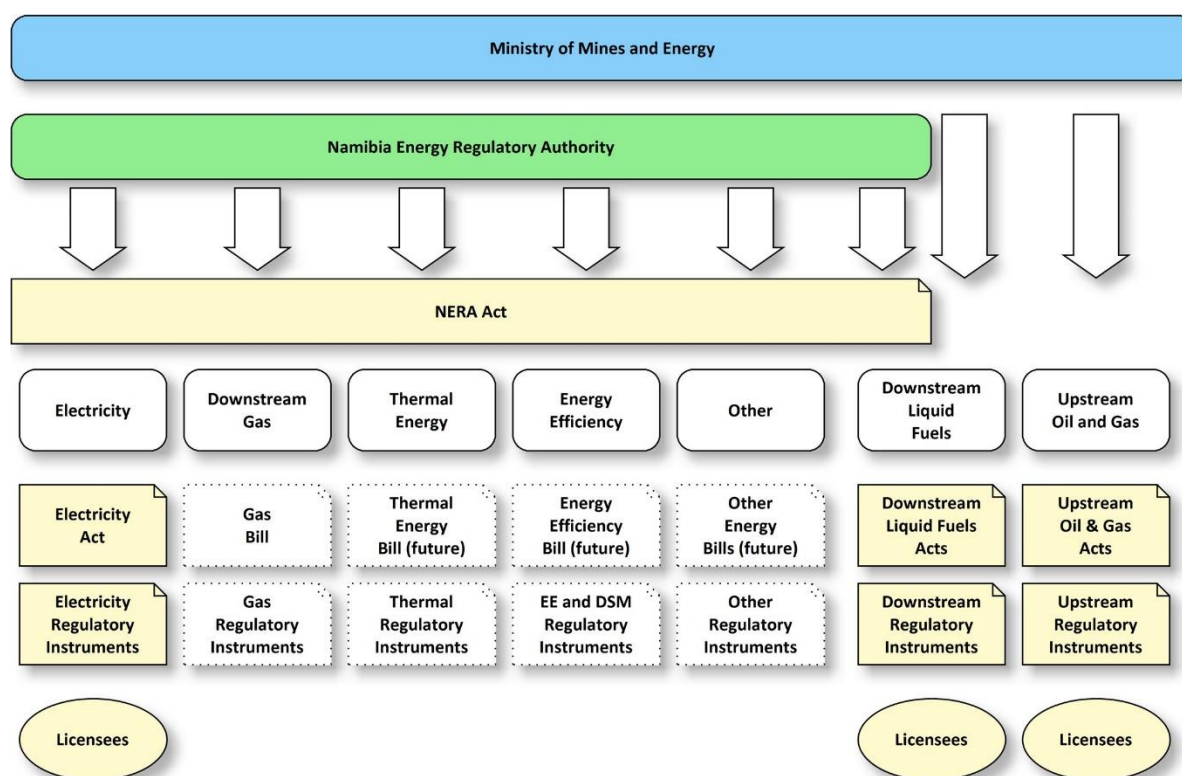


Figure 12: Envisaged Future Legal and Regulatory Framework

4.3 Resource Mobilisation

The mobilisation of resources required to implement this Policy is likely to proceed using a variety of channels and approaches, of which the main options and responsibilities are summarised below.

Funding Source	Envisaged Application	Main Responsibility
Government budget	All activities that cannot be funded from the sources below	MME, in consultation with NPC
National Energy Fund	Activities that fall within the legal scope and financial means of the NEF	MME, including by way of adjusting the levels of levies that contribute to the NEF

Funding Source	Envisaged Application	Main Responsibility
ECB levy (and related levies raised by NERA in future)	Activities that fall within the regulatory responsibilities of the ECB/NERA	ECB/NERA, with authorisation of the MME, as appropriate
Public-Private Partnerships	Activities from which the PPPs can directly benefit	MME / Ministry of Finance to facilitate the processes required to enable such funding
Private Sector	Activities from which the private sector can directly benefit	MME, to facilitate the processes required to enable such funding
Grant funding	Activities that can benefit from grant funding	MME, in consultation with ministries and agencies tasked with facilitating and administering such funding

Table 1: Main Options and Responsibilities for Resource Mobilisation to Implement the Policy

4.4 Reporting, Monitoring and Evaluation

The implementation of this Policy is to be monitored and evaluated by the National Planning Commission, in accordance with its mandate. Regular reporting by the MME to the NPC is to be agreed on between the parties, on approval of this Policy. Monitoring and evaluation is to be broadly based on the Implementation Plan that is an integral part of this Policy, which is to be further elaborated from time to time in the MME's strategic plans.

4.5 Advocacy and Dissemination

The MME is responsible for the dissemination of this Policy, and the facilitation of all advocacy activities associated with it. Specific advocacy activities are described in the Implementation Plan that is part of this Policy, which may be further refined and formulated by the MME, as required from time to time. In addition, the MME may delegate the implementation of specific advocacy activities and responsibilities as they arise under this Policy to regulatory bodies, Government agencies and energy industry participants, as may be appropriate, and in a manner that ensures an effective implementation.

5 Conclusions

To be added upon finalisation.