GOVERNMENT OF THE
KINGDOM OF ESWATINI

MINISTRY OF NATURAL
RESOURCES & ENERGY

NATIONAL ENERGY POLICY 2018

COUNTRY NAME REFERENCE

Swaziland as referred to in the document is officially the Kingdom of Eswatini

Foreword by the Minister responsible for energy

Sustainable energy plays an important role in fostering the attainment of the Kingdom of Eswatini's national development goals. The Ministry of Natural Resources and Energy is mandated to create a conducive environment to promote the efficient and effective utilization, beneficiation and management of natural resources in the country in order to enhance sustainable socio-economic development. This mandate is enshrined in the National Energy Policy which seeks to ensure the sustainable supply and use of energy for the benefit of all citizens of Eswatini

The Government of the Kingdom of Eswatini has prioritised sustainable energy in an attempt to increase investment in the sector to reduce energy insecurity, alleviate poverty as well as mitigate and adapt to climate change. It is for this reason therefore that the country aligned itself with the three goals of the Sustainable Energy for All (SE4ALL) initiative, to provide a framework for the revision of our energy policy goals and strategies. His Majesty King Mswati III, during his 2017 Parliament opening speech, emphasised that "Government will support IPPs in the biomass, hydro power and other RE sources in order to meet the target of 50% of the energy mix in the electricity generation",

Over the past fourteen years the National Energy Policy (2003) created the policy direction for the liberalisation of the energy sector through the enactment of the Eswatini Electricity Company Act of 2007, the Electricity Act 2007 and the Energy Regulatory Act 2007, which substantially transformed the structure of the Electricity Sector and enhanced participation of the private sector (IPPs) in the industry, particularly in the renewable energy space. The country's national electricity access also increased significantly from 5% in 2013 to 72% in 2017.

Significant changes in the global, regional and national energy space have been observed which include rising energy prices, increased support for new and innovative clean energy technologies, reforms of energy institutions and the regulatory framework as well as the strengthened drive to ensure sustainability in the generation and use of energy. The water- energy – food nexus has increasingly become a priority to the country, to ensure effective cross sectoral planning for the efficient and effective use of the country's natural resources. These new developments made it necessary for the Ministry to review and update the National Energy Policy.

This revised National Energy Policy of 2018 therefore seeks to create a framework for the sector that is robust and aligned to these global trends. It has ambitious goals and strategies which seek to strengthen the energy sector institutional and legal

MINISTER OF NATURAL RESOURCES & ENERGY | **JABULILE MASHWAMA**

frameworks for the effective regulation of the sector. This in turn is expected to create a conducive environment for investment in the electricity, petroleum and energy efficiency sectors.

The Ministry is committed to the goal of having 100% access to modern energy by 2022 and eradication of energy poverty by 2030. Furthermore, the Ministry will ensure that appropriate local standards are established for relevant Renewable Energy and Energy Efficiency technologies to enhance ease of trade, ensure safe and relevant quality to the consumers. The fast tracking of the development of national strategic storage for petroleum products and enforcement of commercial storage is also high on the Ministry's agenda.

I wish to thank the various stakeholders that have participated in the various consultative processes and provided input into the revision of the National Energy Policy. With this input, the policy reflects the broad and diverse range of issues that will impact the sector in the next fifteen years. Special gratitude and appreciation is extended to the African Development Bank for the financial and technical support towards this project.

Hon. Jabulile Mashwama (Senator)
Minister of Natural Resources and Energy.

ACKNOWLEDGEMENTS

The Ministry of Natural Resources and Energy would like to express its gratitude to all the stakeholders who have contributed to the successful completion of the National Energy Policy (NEP) and the National Energy Policy Implementation Strategy (NEPIS) 2018.

In particular the Ministry would like to thank the Oil Companies, Fuel Retailers, Electricity utility (SEC), the Eswatini Energy Regulatory Authority (SERA) and other key stakeholders (Private sector, Academia, Fuel Industry, Financial institutions, Government Ministries and other Agencies) for demonstrating their interest in, and commitment to, supporting and formulation of the NEP and NEPIS, and their participation in the stakeholder workshops and validation meetings.

The Ministry is grateful for the financial assistance provided by the African Development Bank; the Ministry is looking forward to further working with the Bank in the future. The technical assistance provided by Mr Farai Kanonda and Mr Sam O'Brien from the Bank is gratefully acknowledged.

In particular the Ministry would like to express its appreciation and gratitude to the consultancy team that executed the process of the review of the NEP, Application Européenne de Technologies et de Services (AETS) - France through the leadership of Ms Helene Rask Grøn (Team leader and Macroeconomist), Mr Joseph Ordoqul (Energy Economist), Mr Thyrsos Hadjicostas (Regulatory expert) and Dr Drona Upadhyay (Renewable Energy and Suitability Expert).

The Ministry would also like to appreciate the Energy Department staff that worked so hard to see this policy complete.

LIST OF ACRONYMS AND ABBREVIATIONS

AfDB	African Development Bank
COMESA	Common Market for Eastern and Southern Africa
CSP	Concentrated Solar Power
DoE	Department of Energy Swaziland
EDM	Electricidade de Mozambique
EE	Energy Efficiency
EU	European Union
HH	Households
IEA	International Energy Agency
IPP	Independent Power Producer
IRENA	International Renewable Energy Agency
MCIT	Ministry of Commerce, Industry and Trade
MEPD	Ministry of Economic Planning and Development
MHUD	Ministry of Housing and Urban Development
MNRE	Ministry of Natural Resources and Energy
NBDSAP	National Biofuels Development Strategy and Action Plan
NDS	National Development Strategy
NEP	National Energy Policy
NEPIS	National Energy Policy Implementation Strategy
PPO	Pure Plant Oil
PV	Photovoltaic
REASWA	Renewable Energy Association of Swaziland
RSSC	Royal Swaziland Sugar Corporation
SADC	Southern African Development Community
SAPP	Southern African Power Pool
SE4ALL	Sustainable Energy for All
SEA	Swaziland Environment Authority
SEC	Swaziland Electricity Company
SERA	Swaziland Energy Regulatory Authority
SDG	Sustainable Development Goal
SIPA	Swaziland Investment Promotion Agency

LIST OF ACRONYMS AND ABBREVIATIONS

SIPP Policy	Swaziland Independent Power Producer Policy
SSEG	Small Scale Embedded Generation
SWH	Solar Water Heaters
SZL	Swaziland Lilangeni
ToR	Terms of Reference
UNISWA	University of Swaziland
ZAR	South African Rand

DEFINITIONS

Biofuels	A wide range of liqu id and gaseous fuels derived from biomass. Biofuels – including liquid fuel ethanol and biodiesel, as well as biogas.
Biomass Energy / Bio Energy	Energy derived from any form of biomass/organic material, including bio-heat, bio-power and biofuel. Alternatively, gaseous energy carriers such as bio-methane, landfill gas, or synthesis gas (produced from the thermal gasification of biomass) can be used to fuel a gas engine. Biofuels for transport are sometimes also included under the term bioenergy (see Bio fuels).
Cost Reflective Tariff / Price	Tariff or the price of electricity or an energy product that takes into account the full cost of supplying energy or electricity to the consumer, including the generation, transportation and distribution costs.
Energy Access	Access to modern energy services provided through clean cooking fuels, clean heating and lighting systems, and energy for productive use and community services.
Energy Poverty	Absence of choice in accessing adequate, affordable, reliable, qual ity, safe, and environmentally benign energy services to support economic and human development.
Embedded Generation	Generation of power in a small scale normally connected to a distribution network, as opposed to a transmission network, and is located cl ose to the place where the power is consumed. An example of embedded generation is a PV panel connected to the grid and installed in a household rooftop.
Energy Efficiency	Measures undertaken to reduce the losses in generation, transmission and distribution networks on the supply side and to reduce the consumption of energy in demand sectors that include household, industry, commerce.
Energy Mix	The Energy Mix of a country/region is the specific combination of different energy sources it uses to meet its energy consumption needs-often a combination of non-renewable and renewable energy.
Feed in Tariff (FIT)	A feed-in tariff is a policy mechanism designed to accelerate investment in renewable energy technologies. It achieves this by offering long-term contracts to renewable energy producers, typically based on the cost of generation of each technology..
Integrated Resource Plan (IRP)	A public planning process and frame work within which the costs and benefits of both demand and supply side resources are evaluated to develop the least total cost mix of utility resource options.
Independent Power Producers (IPP)	IPP is a private entity, which generates and supplies power to the state utilities or directly to the end users. IPP is not a state utility but can be part of a Public Private Partnership entity together with a state utility.
Intended Nationally Determined Contributions (INDC)	In preparation for the International Climate Agreement at the UNFCCC Conference of the Parties (COP21) in December 2015 in Paris, countries (Parties) around the world publicised what post-2020 climate actions they intended to take, known as their **Intended Nationally Determined Contributions** (INDCs). The pledges in INDCs will largely determine whether the goals of reduction in global temperature rise can be achieved. Developing countries/Parties can benefit from global climate funding to implement their INDCs.
Poverty Line[1]	Poverty is defined as the percentage of people living with an income of less than $1.25 per day(poverty line) The Participatory Poverty Assessment (PPA) of 1997 identifies deprivations to include poor conditions of housing and clothing as well as lack of access to basic education and health care.
Renewable Energy	Energy produced from sources which are naturally replenished or not depleted when used. Example of renewable energy sources are solar, wind, hydropower and sustainable biomass.

[1] The Swaziland Poverty Reduction Strategy and Action Plan 2007

VISION

The Vision for NEP and NEPIS represents the fundamental aspiration of the Government of Eswatini and remains the principle upon which all Energy Policy Goals shall be based.The National Energy Policy positions are based on the overall vision which is:

"To meet the energy needs of the Country in a sustainable manner that contributes to economic growth and well-being of the population".

The Vision will be achieved and guided by five principles:

* Ensuring access to available and affordable energy for all
* Enhancing employment creation
* Ensuring security of energy supply
* Stimulating economic growth and development
* Ensuring environmental and health sustainability

Electricity Policy Positions

The Government of Eswatini has set up the following Electricity Policy Positions

1. To ensure adequate security of electricity supply
2. To ensure efficient and cost effective electricity supply integrating pricing for economic efficiency and financial sector viability
3. To support the development of RE resources for a target of 50% of the energy mix in the electricity generation
4. To plan and support a comprehensive development of national capacities in RE projects
5. To strive to provide all households with access to modern energy by 2022.
6. To strive to ensure eradication of energy poverty at all levels by 2030
7. To ascertain options and ensure establishment of a national Electricity Fund in support of renewable energy and accelerating access to modern energy throughout the country

Electricity Policy Positions

8	To ensure the launch and implementation of a National Energy Efficiency Policy and associated implementation Strategy covering all relevant sectors of the economy
9	To facilitate the further liberalisation of the electricity market
10	To facilitate the access of IPPs in the electricity market through an effective regulatory framework
11	To ensure that appropriate local standards are established for relevant RE and EE technologies to enhance ease of trade and ensure safe and relevant quality to the consumers

Petroleum Policy Positions

The Government of Eswatini has set up the following Petroleum Policy Positions

12	To ensure security of petroleum supply through establishment of national strategic petroleum stock storage and enforcement of commercial storage
13	To introduce mandatory fuel blending with up to 10% by 2030

Petroleum Policy Positions

14 To ensure transparent governance of the petroleum market through an effective regulatory framework

15 The Ministry of Natural Resources and Energy will initiate increased coordination, clarity and safe operation in the petroleum sector between Ministries and between the Wholesale and Retail Industry partners

16 To ensure continued transparent governance of the Strategic Oil Reserve Fund to finance any increases in the cost of purchasing fuel and promote the use of clean fuels

17 To ensure petroleum pricing and taxation in line with cross cutting policies including environmental obligations and access to energy for all

18 To promote increased availability of LPG as an alternative modern source of energy for HH and Industries

19 To explore options to include Natural Gas in Eswatini's energy mix

Overall and Cross Cutting matters

The Government of Swaziland has set up the following Overall and Cross cutting matters

20 To ensure that Eswatini adopts and oversees enforcement of clean fuel targets such as reducing Sulphur levels in both petrol and diesel in line with the regional targets and standards

21a To promote alleviation of poverty through means of energy provision

21b To improve gender equality throughout the energy sector

22 To ensure appropriate institutional capacity is in place to manage and develop Eswatini's Energy Sector to the benefit of all.

23 To establish and ensure systematic monitoring of NEP 2018

1 INTRODUCTION

1.1 THE NEED FOR REVISION OF THE ENERGY POLICY

The Government of Eswatini acknowledges energy as one of the key drivers for economic development. The achievement of the macro economic development goals, as they are formulated in the National Development Plan (NDP), also depends on clear, measurable and practical policy directions and actions for energy in the short, medium and long-term.

Eswatini's energy sector has hitherto been driven by directions and intentions formulated in the National Energy Policy, 2003 (NEP 2003). The first National Energy Policy (NEP) represented a significant step forward in terms of guiding the energy sector and significant goals have been achieved. Some of the absolute essential achievements in the electricity sector include:

- ✓ Significant increase in the national electrification rate (5% as reported in NEP 2003 to 69% in 2016). The electricity supply has also improved with fewer prolonged power outages.
- ✓ Establishment of the Electricity and Regulatory Authority Act, 2007
- ✓ The establishment of an Energy Regulator as a first step to ensure broader investor participation in the electricity sector. The Regulator currently focuses on electricity and it is envisaged this progress can expand to include the petroleum sector in the future.
- ✓ The establishment of an Independent Power Producer (IPP) Policy (2016) which is a step in the direction or increased private sector power generation.

In the Petroleum sector, some of the greatest achievements include:

- ✓ Expansion of the petroleum supply network across the country.
- ✓ Securing steady and transparent pricing of fuel through implementation of a clear pricing model since 2005.
- ✓ Ensuring safe supply of petroleum products also through rigorous inspection and compliance of safety standards.
- ✓ Establishment of the petroleum inspectorate and a petroleum product testing laboratory in 2005

This updated NEP will support further energy expansion both in the petroleum and the electricity sectors. Accepting the definition of energy poverty as “the absence of sufficient choice in accessing adequate, affordable, reliable, quality, safe and environmentally benign energy services to support economic and human development”, Eswatini is still faced with energy poverty at some levels. About a quarter of all households suffer from acute energy poverty especially for cooking and also for initiation of productive end-use activities. The industrial expansion options seem available due to access to increased imported power, but in reality, large expansion programmes may be limited due to absence of long-term secured power supply. The risk associated with dependency on energy imports can be mitigated through long-term Power Purchase Agreements (PPA's) holding favourable conditions.

All modern economies rely on adequate, affordable, reliable, quality, safe, secure and not-harmful energy to prosper. This means that if Eswatini's economic prosperity has to be achieved and living standards for the majority of households improved, a paradigm shift in policy and planning for energy supply and consumption is necessary. While the first National Energy Policy yielded significant results in terms of general electrification, the slow growth of productive activities undermines broader macro-economic development and the absence of access to available modern energy renders Eswatini stagnant at an insufficient level of development. The vision and supplementary implementation strategies following this updated energy policy will pave the way for the needed transformation.

In the past energy planning has largely focused on the existing consumers and use of existing supply chain, including especially the imports from South Africa. This has led to a number of undesirable results. Not only does the significant energy import undermine the trade balance, the price tag for peak import is financially uncovered as the import peak price is higher than the domestic selling price. Although the electricity supply is generally stable the productive sectors in rural areas are in general the first to lose power at times of short supply, severe rain or thunderstorms. Further, the rural poor who are currently not connected to the grid are likely to remain energy poor as the connection costs exceed present consumption needs.

Despite almost doubling of electrified customers, up from 88,182 in 2010 to 150,602 customers in 2015, the actual sale of electricity has not increased at the same rate. In 2010 Swaziland Electricity Company (SEC) sold 977 GWh of electricity and in 2015 the sales were 1,074 GWh.[2] Increased co-generation from the sugar industry and shut down of major industries like the Swaziland Paper Mills and SAPPI Usutu has also contributed to sales figures showing a slower growth than the electrification rate.

The revised NEP forms the umbrella framework for the implementation of the Petroleum Bill, the Swaziland Independent Power Producer Policy (SIPP Policy), the Sustainable Energy for All (,SE4ALL initiative and other energy directives related to thermal, renewable and rural energy provisions including the upcoming National Energy Efficiency Policy. The NEP 2018 provides input to a number of national policies and action agendas including the National Development Plan (NDP) and the Poverty Reduction Strategy and Action Plan of 2007 as well as the National Climate Change Policy and its Strategy and Action Plan.

1.2 ENERGY POLICY CONTEXT

The Kingdom of Eswatini is landlocked in the Southern African region and covers an area of 17,364 square kilometres (km²). It shares about three-quarters of its border with South Africa to the south, west and north and the remaining one-quarter is shared with Mozambique to the east. Eswatini's economy is closely linked with its regional partners, in particular South Africa. The economic indicators are important for planning energy provision going forward. While history shows that external actions may impact the economy, history also shows that through sound management, Eswatini has managed to sustain its economic positions and grow the economy and therefore also the energy use. As per March 2017, the economy shows a slight downward trend:

GDP growth rate (December 2016[3]);	- 0.6%
GDP Per Capita	SZL 48,406
Consumer inflation (March 2017[4])	6.0%
Discount lending rate (March 2017[5]):	7.25%
Prime lending rate (March 2017):	10.75 %
Gross Official Reserves declined by 13% from last quarter 2016 (months reserves of import) to 3.6 %	
Public debt increased by 25% from 2016 to 2017 to 18 % of the GDP	

[2] SEC annual report 2015
[3] African Economic Outlook, 2017 Swaziland
[4] Economic Bulletin 21, 1st quarter 2017, Ministry of Economic Planning and Development Swaziland
[5] Economic Bulletin 21, 1st quarter 2017

The population of Eswatini is estimated to be 1,132,657[6] with a modest annual growth rate estimated at 1.2%. Eswatini ranks as a lower middle-income country at number 1**48 out of 188 in the 2015 Human Development Index.** Despite its status as a lower middle-income country, **63 percent of Swazis live below the national poverty line**[7]. As of 2013, Eswatini's estimated life expectancy had dropped to 48.87[8], largely as a result of high HIV/AIDS and tuberculosis prevalence. The population of Eswatini is fairly young with a median age of 20.5 years and people aged 14 years or younger constitute 37.4% of the country's total population[9]. The development and job opportunities are centred on the larger cities.[10]

Eswatini's productive economy is fairly diverse. Agriculture and forestry contribute to about 7.5% of the GDP. Manufacturing represents around 44%. Services, particularly government services, constitute the remaining 48% of the GDP. [11]

Increased growth is needed to ensure all members of our society can benefit from welfare improvements and creation of new and additional jobs is a high priority of the Government. The energy sector can contribute to improved growth and job-creation through strategic creation of green energy jobs for example in the bioenergy industry, solar industry and energy efficiency sub-sectors. The current unemployment rate is around 28.1[12] and the youth unemployment is estimated to be over 50% and close to 60% for the youngest group up to 24 years.[13] Insufficient jobs push up the formal and informal migration to South Africa which is a further drain to our economy of dynamic resources. Going forward the Government will endeavour to maximize job-creation options in the energy sector by focus on local beneficiation and employment inclusion.

The 25-year National Development Strategy (NDS) highlights energy as a key sector for achieving socio-economic development through three central strategic objectives. These are:

- ✓ research and development,
- ✓ energy efficiency, and
- ✓ energy access.

Identifying options for domestic electricity generation and electricity access and increasing the domestic use of renewable energy technologies are some of the fundamentals for achieving the above development goals.[14]

Regional Context

A key regional partner, the Southern African Development Community (SADC), is important for energy policy harmonization. Eswatini also enjoys full participation in the Southern African Power Pool (SAPP). This membership includes an obligation on the Government to implement policies and measures that will most favourably take advantage of market conditions and regulatory structures with regard to the SAPP. Connection to and participation in the SAPP affords Eswatini the opportunity to export and trade electricity generated locally into a competitive market with other interconnected SAPP members.

Eswatini is also a member of the Common Market for Eastern Africa (COMESA)[15]. COMESA strives to pursue a strategy fostering to effectively address constraints related to the improvement of energy infrastructure and services in the region in order to reduce the cost of doing business and also to enhance competitiveness,

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[6] Economic Bulletin 21, 1st quarter 2017, Ministry of Economic Planning and Development Swaziland
[7] Economic Bulletin 21, 1st quarter 2017, Ministry of Economic Planning and Development Swaziland
[8] https://countryeconomy.com/demography/life-expectancy/swaziland
[9] Swaziland Demographics Profile 2016 www.indexmundi.com
[10] www.data/World Bank/Swaziland
[11] Southern African Economic Outlook 2013
[12] Recorded figure from 2013 from Economic Bulletin 21, 1st quarter 2017, Ministry of Economic Planning and Development Swaziland
[13] www.theglobaleconomy.com/swaziland and ILO/Swaziland
[14] National Development Plan 1999
[15] www.COMESA.int

through fostering physical regional connectivity and deepening infrastructure integration. Bench-mark models for regulatory documents, policies and action planning are part of the services delivered by COMESA.

Electricity in the region is generated mainly from coal and hydroelectric resources. South Africa accounts for more than 83% of the total regional electricity production, followed by Mozambique, Zambia and Zimbabwe.[16] Other than Mozambique and the DRC, most countries in the region suffer from insufficient electricity supply. In 2015 the regional operating capacity was 43,964 MW.[17] The peak plus reserve margin demand was 51,885 MW or a shortfall close to 8,000 MW. South Africa alone accounted for 7,000 MW of this capacity shortfall. Eswatini's own operating capacity was listed as 55 MW and a peak plus reserve demand set at 251 MW giving rise to a shortfall of 196 MW which is imported from South Africa.[18]

While SADC attaches significant importance to all energy sources - renewable and non-renewable - the electricity sector is the one area where regional cooperation has advanced significantly. Regional energy security holds prime importance and sensitive balances are found between improving national self-sufficiency and improving the regional trading regime.

The transmission network is important for Eswatini. The 400 kV line which crosses the country and links Mozambique to South Africa, is the main interconnector between Eswatini, South Africa and Mozambique. It is operated by MOTRACO, a transmission company which is a joint Venture between SEC, ESKOM and EDM. Medium and long-term options to export power are possible from Eswatini to the other SADC countries (via the SAPP interconnected network) and potential energy production for export investments will be planned in combination with upgrading of this infrastructure. Other minor exchanges are also expected via the 132 kV transmission network, which is owned by SEC.[19]

International Collaboration

Eswatini is a member of the United Nations and has committed to the Sustainable Development Goals (SDG) which includes a target of 50% renewable energies in the mix by 2030. Among the multiple international partners and engagements. Eswatini enjoys membership of IRENA and benefits from technical support for energy related policy formulation and monitoring actions. Similarly, extensive support is received from the AfDB, the EU, the World Energy Council and the International Atomic Energy Agency. Support has been provided by the USAID among other for the formulation of the IPP Policy. UNDP is also a key partner envisaged to support implementation of parts of this undated NEP 2018.

16 SADC Energy Monitor 2016
17 SAPP energy statistic 2016
18 *Demand and Supply Balance with Current Peak Demand 2015*
Source SAPP, November 2015
19 *Transmission interconnector commissioned since 1995*
Source: SAPP

2 OVERVIEW OF THE ENERGY SECTOR

2.1 CURRENT AND POTENTIAL SUPPLY

The energy balance – energy supply

As of 2016 the total primary energy supply consists of coal, biomass, hydro, imported electricity and oil products. The contribution of each energy source to the energy supply for the country is shown in Figure 1 below.

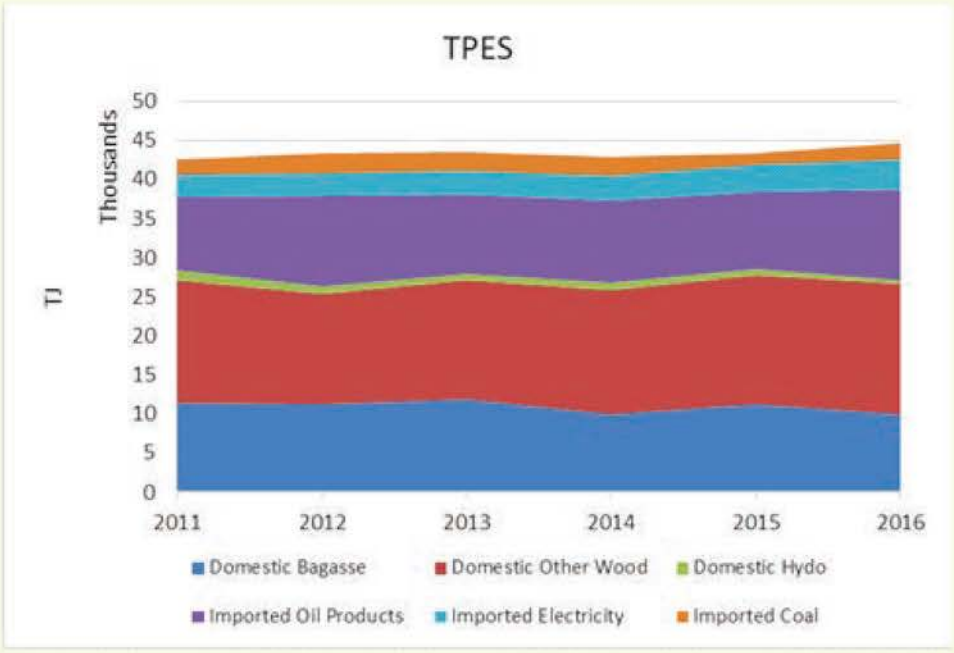

Figure 1 Total Primary Energy Supply[20]

Eswatini's energy mix of 2016 shows (see Figure 2) the following issues regarding energy security:

- Supply of wood for domestic use (37% of primary energy supply) is mostly unsustainable (limited replanting of trees). This situation is described further below with corresponding policy directions in order to reduce wood consumption and subsequent indoor pollution – and improve population's health
- Use of bagasse (22% of energy supply) is mostly for industrial purposes with limited incentives to generate excess electricity for the interconnected national grid. Possibilities to increase electricity generation for the grid are discussed below.
- Oil products (26% of the energy supply) are all imported. Possibilities to produce ethanol for blending and biodiesel are discussed further below.
- Coal (5% of the energy supply) is imported, mostly by industry, in the form of bituminous coal while local production (anthracite and semi anthracite) is exported.
  Coal imports should remain modest in the future. For indigenous coal, ambitious projects are being studied by MNRE and SEC in order to build 1 or 2 of 150 MW power plants before 2030. This is also discussed below.
- Electricity represents the rest of the primary energy supply, with more than 60% imported from South Africa, Mozambique and the SAPP Day-Ahead Market. In 2014, approximately one third of electricity supplied was produced by SEC with its existing hydropower plants. This amount was drastically reduced to 10% in 2016 due to a severe drought which resulted in no hydropower generation at the end of the year.

[20] Swaziland Energy Master Plan, MNRE

2.1.2 *ELECTRICITY GENERATION POTENTIAL*

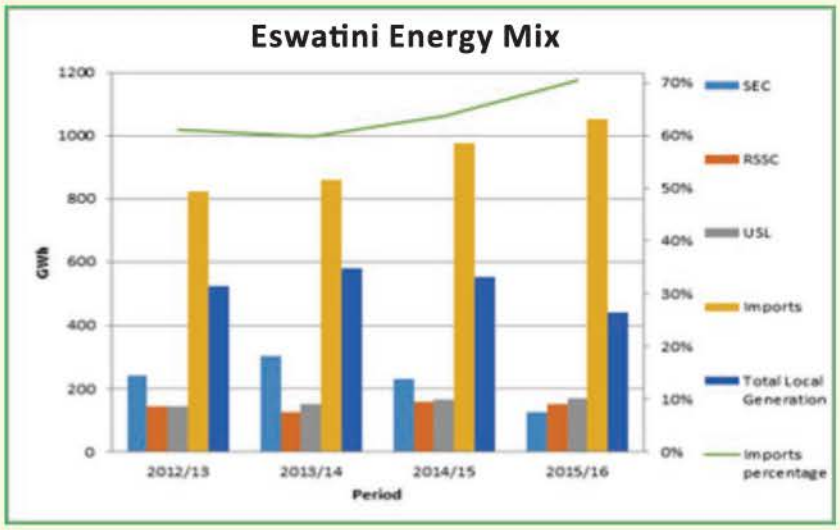

Figure 2 Energy Mix: Eswatini Electricity supply[21]

The energy balance – energy demand

The final energy use in 2016 by sector is shown below. The transport sector used only oil products: petrol and diesel. The sugar industry consumed electricity produced from own generation and some imports from the utility company whilst the residential sector used a combination of wood, oil products in the form of paraffin and liquefied petroleum gas, and electricity. The agriculture sector consumed electricity and diesel. The commercial and building sector consumed electricity, coal and oil products as also shown in the Figure 3 below.

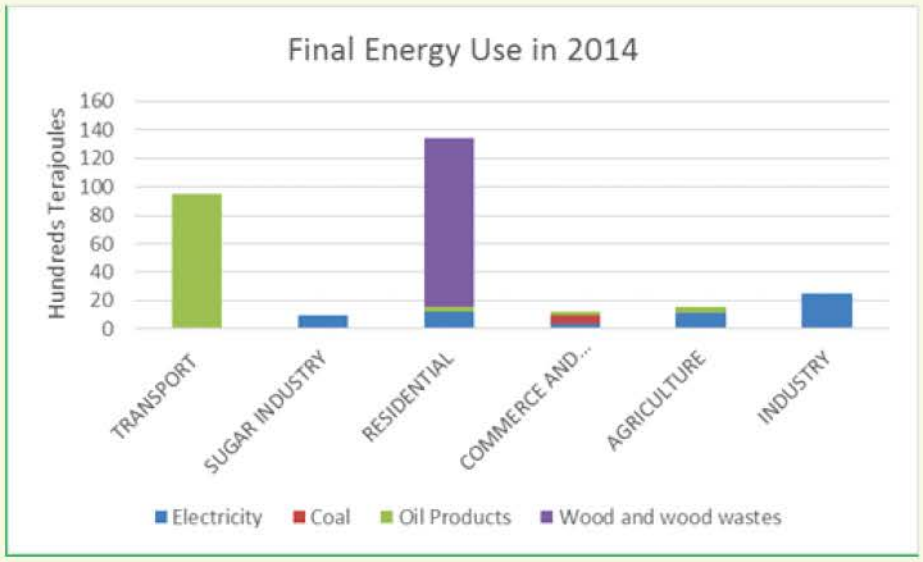

Figure 3 Final Energy Use 2016[22]

1.1.1 CURRENT GENERATION OF ELECTRICITY

Indigenous power generation in Eswatini represented up to 30% of the total electricity supply. The remaining electricity was imported, mostly through ESKOM. The domestic production consists of hydropower plants (see description further on) owned by SEC which accounted for around 20% of the total electricity supply in 2015, and around 10% in 2016 (due to severe drought). The rest of the domestic power generation consists of exports from Ubombo Sugar Limited (USL) to SEC and energy produced by sugar cane industries (mainly RSSC and USL) for their own consumption.

21 Swaziland Energy Masterplan, MNRE 22 Swaziland Energy balance 2016

The maximum system demand on SEC was 220 MW in 2016. The current SEC installed capacity is 70 MW, out of which 60.4 MW is hydro (mainly used for peaking) and 9.5 MW is diesel generation which is mothballed. The Swaziland Electricity supply industry allows participation of independent power producers such as:

- USL (41.5 MW, bagasse) self-use and export excess to grid
- USA Distillers (2.2 MW, coal-based) self-use
- RSSC (65.5 MW, bagasse) self-use and
- Wundersight (100 kW, solar PV) grid-tied.

In 2016, the sugar industry produced 271 GWh of electricity from their combined heat and power generation units according to the Eswatini Energy Master Plan from MNRE.

In 2016, SEC generated 123.3 GWh of electricity (10% of the total requirement for the country) from their hydro-electricity plants and imported 1,077.1 GWh, mainly from South Africa. The persistent drought during 2015 and 2016 led to such dramatic drops in the dam levels that the domestic electricity production from hydro came to a complete stop in late 2016. With 55.6 GWh bought from USL, the total energy supply to the interconnected system was 1,256 GWh. Energy sold to the customers was 1,084.1 GWh so that energy system losses amounted to 171.9 GWh (13.7% of total supply).

With limited domestic electricity production, Eswatini is currently largely dependent on electricity imports. The cost of electricity import is negatively impacting Eswatini's Balance of Payments, and the import and consequent adverse effects will only increase if national generation is not developing faster than the national electricity demand.

Irrespective of the high import quota and the imported peak price exceeding the peak sales price, the SEC Annual Report (2015 - 16) shows a balanced result – in fact with a small profit (3% return on total assets). Newly applied tariffs by SEC (effective 1 April 2017) show that only large customers (mostly industrial and large commercial) who are applied Time-of-Use Tariffs (TOU) will pay true cost-reflective tariffs at peak time during high demand season. For domestic, small commercial and agriculture customers, which is approximately 70% of total sales, the tariff charged by SEC per kWh will be significantly lower than the price paid by SEC to ESKOM.

This situation is unsustainable as important cross-subsidies are *de facto applied* whereby large customers subsidize smaller ones. Subsidies are very common for the poorest domestic consumers in the SADC and COMESA regions and are widely accepted as a means to alleviate poverty while promoting development. It is also believed that “rich” consumers (domestic and small commercial) are also benefiting from these cross-subsidies. Most importantly, in recent years, it is increasingly accepted that such cross-subsidization hampers industrial development which further reduces growth and job creation.

It is important to mention that MNRE working with SEC has embarked on a nationwide demand-side management programme on “Energy efficiency and load shifting” including important measures such as:

- National information dissemination campaigns: road shows, radio programs, billboards
- Energy audits and demand monitoring for large customers to encourage load shifting
- Application of TOU tariffs
- Roll out of prepaid meters replacing credit meters to all domestic customers
- Establishment of a Power Loss Team focusing on reduction of commercial losses and technical losses

1.1.2 ELECTRICITY GENERATION POTENTIAL

Eswatini is well-endowed with conventional and renewable energy resources, including coal, solar, hydro, wind and biomass residues from the sugar and forestry industries. These resources have a technical potential to meet the entire national electricity demand if fully exploited, as well as potentially provide for the export of excess energy to Eswatini’s neighbours. The high dependency on power imports contributes significantly to the

country's current account deficit and increases the country's exposure to energy supply risks, both in terms of supply security and price shocks. The existing electricity production facilities within Eswatini are from hydropower and sugar cane based on co-generation.

a) Renewable Energy Generation Potential

(a) Solid Biomass Energy

Just over 60% of the total primary energy supply (TPES) comes from solid biomass sources,[23] mainly composed of wood products (firewood and waste by-products from timber industry) and bagasse from Sugar industries. Traditional biomass is widely used for cooking and space heating in Eswatini, with rural areas accounting for up to 90%[24] of the population using firewood for cooking.

The two available resources for biomass electricity generation in the country are timber (wood chips and forestry waste) and sugarcane (bagasse). There are currently on-going negotiations to establish a 35 MW electricity generation power plant that will use timber. Similarly, the sugar industry is already exporting to the grid and has capacity to export additionally 60 MW of bagasse based electricity to the grid. In the year from April 2015 to March 2016, a total of approximately 56 GWh sugar bagasse generated electricity was transmitted to the grid.

(b) Hydropower

Hydropower has been one of key sources of indigenous renewable electricity produced in the country with recorded capacity of 60.4 MW in 2016. SEC operates four grid connected hydropower plants in Eswatini: Edwaleni (15 MW), Ezulwini (20 MW), Maguduza (5.6 MW) and Maguga (19.8 MW).[25]

All of these hydro power stations operated by SEC work as peaking power plants. The actual production from these power plants varies significantly depending on the rainfall patterns. In recent years, the hydropower generation in the country continued to depict a declining trend, as a result, in 2016 the generation capacity declined to approximately 10%.

The most recent assessment of the hydropower potential of Eswatini show[26] that a total of over 116 MW can be generated from four different hydropower schemes ranging from less than a megawatt to a 100 MW scheme, as shown below.

1.	Mnjoli Dam	1.50 MW
2.	Ngwempisi River Cascades	100 MW
3.	Lubovane Dam	0.85 MW
4.	Lower Maguduza	14 MW

Even though hydropower as such can be regarded as a stable source of renewable electricity generation, including its suitability as a source of base load power, in the case of Eswatini hydropower has been used for peaking due to uncertainty in availability of water. Moreover, the existing dams are prone to siltation due to land use change in the catchment area. In addition, there have been major changes in rainfall patterns in the recent years giving rise to uncertainty in power generation from hydropower schemes. Any future planning on expanding hydropower source needs to consider this aspect.

23 Swaziland Final Energy Balance (draft), 2014
24 RRA, Swaziland
25 SEC Annual Report, 2015-2016 & SEC Website
26 Hydro Reconnaissance Study for Swaziland

(a) Solar Energy

Solar resource available[27] in Eswatini is approximately 1,700-1,800 kWh/m^2 throughout the country with the best potential towards the South East:[28]

There are a number of small privately owned solar PV systems operating in parallel to the grid. There is one grid connected Solar PV of just over 100 kW located near the town of Siteki in eastern Eswatini installed and operated by an IPP.

The Swaziland Electricity Company has identified six potential sites adjacent to sub stations where solar PV systems can be developed and operated by IPPs with ease of access to the grid. SEC will develop these sites through a tendering process. In addition, large untapped potential for solar home systems, solar lanterns and combined cooking/light and other off grid options exists in the country.

(b) Wind energy

Various Wind power resource studies have been undertaken in Eswatini[29] resulting in inventories of possible wind power sites under various zones. With the help of these zoning studies a total of 14 potential zones for wind power generation have been identified. These have a total production capacity of approximately 2.2 million MWh.

In addition, a review and analysis of existing data (collected in early 2000s for Solar and Wind resources in the country) were carried out in 2016 with support from AfDB.[30] This report recommends measuring of the wind data using taller masts. This should be taller masts (at hub height) measuring about 100 metres and conform to IEC standards.

(c) Geothermal Energy

There are many hot springs known to exist in Eswatini though little information is available regarding the potential of generating electricity using geothermal source. During NEP 2018 further exploration to map the actual potential of geothermal energy and its viability to generate power can be considered.

(d) Biogas

Eswatini has cattle and other domestic animals which could be the sources of biogas production in the country. Some demonstration activities have been carried out in a piggery in the country but large-scale adoption has not taken place.

a) *Embedded generation*

There is a potential and a number of different options for embedded generation that can be connected to the distribution network in Eswatini. So far, these potentials have not been realized due to absence of a regulatory framework facilitating the transactions, potential risks to the distribution network and unclear trading regime. The Government has already taken initiatives to ascertain options of a roll-out of allowing embedded generation into the network and legislative clarity is envisaged to be in place in the short term. The different options for embedded generation may include:

- Open and closed cycle gas turbines
- Reciprocating engines (diesel, oil)
- Hydro
- Wind turbines
- Photovoltaic generation (solar)
- Co-generation

27 Global Horizontal Irradiation by SOLARGIS
28 Renewable Energy Zones for the Africa Clean Energy Corridor, IRENA, 2015
29 IRENA's Africa Clean Energy Corridor initiative (2015)
30 Report on Review and Analysis of Existing Solar and Wind Resources

Embedded generation can include different sizes of power generation and for Eswatini the following categorisation is used:

- Micro generation - up to 100 kW
- Small generation - up to 1,000 kW
- Large generation - above 1,000kW

The generation potential can increase if all roof-tops, all small streams and other generation options theoretically are included in the network.

c) *Transmission of Electricity*

A 400kV interconnection from the Republic of South Africa through Eswatini to Mozambique is used to import power from South Africa and Mozambique to Edwaleni II Substation. Similarly, a 132kV line from Normandie is used to import power from South Africa terminating at Nhlangano 2 Substation. The power is then transmitted through 132kV / 66kV line to various substations located country wide where the power is further stepped down to 11kv for further distribution. A summary of the transmission lines is shown in Table 1 below.

Table 1: Transmission Lines[31]

Capacity	Length (km)
400Kv	146.83
132Kv	296
66Kv	970

2.2 CURRENT PETROLEUM PRODUCTS

Eswatini imports all its petroleum products from neighbouring countries. In 2016, the imports totalled just over 330,000 kilolitres of oil products,[32] as shown in the Table 2 below.

Table 2: Imported petroleum products in 2016

Product	Amount (kilo-litres) (2016)
Lead Replacement Petrol (LRP)	5,850
Unleaded Petrol (ULP)	151,271
Other kerosene	5,040
Diesel	169,008
TOTAL	**331,169**

31 Swaziland Electricity Company's Annual Report 2015/2016
32 MNRE

Eswatini holds no strategic fuel storage facility of any significance and it is up to the wholesalers to ensure storage. Absence of strategic reserves leaves Eswatini at risk. Potential shortage or vulnerable stock is not in line with Government's policy or SADC recommendations of 90 days' storage.

The majority of oil products (85%) are consumed by the transport sector while about 7% is consumed in the agriculture sector. The industry-related sector is recorded to consume 3%, the commercial and public building sector 2% and households 3%.[33]

The LPG market is relatively small. Nationally, fewer than 9% of the households use LPG for cooking, the majority of which (16.7%) are in the urban areas and only 4.9% are rural households.[34] The use of LPG for lighting is insignificant and opportunities for improvement of the LPG industry exist. The use of LPG has decreased over the last decade, as more households switch to electricity for cooking. Despite LPG being what could seem as an attractive alternative to fuelwood, such switch has not yet been forthcoming because most fuelwood is collected for free, while the LPG requires availability of cash.

LPG is currently unregulated and over the years Eswatini has registered concerns about high prices imposed by retailers/dealers on consumers, specifically in rural communities. Broadly, Eswatini is also concerned about safety both in handling and storage of LPG and Paraffin including unsafe paraffin stoves. In addition, a barrier to the uptake of LPG is the start-up costs associated with the use of this fuel. Households, in the low-income group, find it difficult to finance LPG cylinder deposits and equipment costs.

2.2.1 POTENTIAL OF PETROLEUM PRODUCTS

(a) Liquid Biomass

Ethanol is the main potential liquid biomass energy option in the country, particularly as the sugar industry is very well developed. Molasses is used to produce ethanol in the country and current production is 254,000 litres/day (60 million litres/year) of ethanol, most of which is exported (to EU and South Africa) for the beverage and pharmaceutical industry. None of the ethanol produced is currently being used for energy or blending purposes in the country. An anhydrous plant with production capacity of 10,000 litres/day of ethanol already exists in Eswatini and plans to expand this capacity exists in anticipation of mandatory blending coming into force in Eswatini under a separate biofuels strategy.

Eswatini has been exploring the options and possibilities of blending of Ethanol with Petrol since as early as 1995 when a study was conducted to investigate the possibility of blending. The study concluded that blending would not be economically viable due to low crude oil prices and subsidies might be needed to keep the prices of the blended fuel affordable. In 2008, a pilot project was undertaken with RSSC on E10 blended fuel which ran vehicles from RSSC and the Government. According to the pilot project, the vehicles ran without any modifications, and ran as well as under unleaded petrol and sometimes even better. The positive results of the pilot presented a case for mandatory E10 blending in Eswatini.

33 "Draft Energy Master Plan 2017" MNRE Swaziland
34 Swaziland households energy access 2014 – DoE/MNRE

The National Biofuels Development Strategy and Action Plan (NBDSAP) was developed in 2008 to provide guidance to develop a biofuel industry in Eswatini. According to NBDSAP, the strategy regarding blending of bioethanol is to "introduce initial and subsequent blending ratios of 5 and 10 percent for petrol, to be reviewed and made mandatory as and when desirable and feasible." The government is planning to introduce mandatory blending of bioethanol, and clear policy statements for future blending forms part of this NEP 2018.

Diesel can be replaced (either fully or partially) by plant oils in their pure form (PPO) or biodiesel (liquid fuel derived from plant oils). Even though the NBDSAP addresses the issue of biodiesel and PPO, there has not been any significant work on encouraging the use of biodiesel and PPO in Eswatini for transport or industrial use. The National Biofuels Development Strategy and Action Plan (NBDSAP) recommended further research in this area to ensure that biodiesel projects do no hinder efforts by the country to increase food production and conserve biodiversity.

2.3 DEMAND SECTORS

Eswatini is developing an Energy Master Plan against which the country's Energy Policy can analyse the demand and supply structures and prepare and present an informed policy. The national approval of an Energy Master Plan and an Integrated Resource Plan will be discussed in Chapter 4 and appropriate policy goals will be presented to help rectify the absence of informed energy data and analysis. The presentations below are nevertheless the basis for understanding the opportunities and challenges faced by the energy sector.

It may be argued that the energy demand in Eswatini will decrease overall as the households, buildings, institutions and industry switch from widespread use of wood to more efficient energy sources such as electricity, steam or petroleum products. The present reality is however, that large proportions of the current wood use are both unsustainable, as there is no replanting, and unaccounted.

Unmanaged use of energy undermines the ability to use resources wisely. It undermines the growth efforts and long-term development efforts. In reality this will mean that the managed use of energy is likely to increase. The long-term policy path going forward will see fundamental shifts that are aligned with the NDP. This National Energy policy and its underlying policies and implementation strategies will strive to ensure a fundamental shift away from unsustainable practices and over to managed and efficient use of energy. The demand structures are presented with this in mind.

Transport

As mentioned earlier, the transport sector is reliant on import of all oil products and there are no known oil or natural gas reserves in Eswatini. There is presently no upstream oil industry in Eswatini. In 2017, there are four active wholesale importers and distributers of oil and petroleum products. Oil and petroleum products are sold through a network of wholesale and retail structures.

The regulation of the sector is being consolidated in the Petroleum Bill currently under consideration.

In 2011, approximately 153,000 vehicles were registered in Eswatini,[35] including 118,291 cars and 4-wheeled light vehicles, approximately 3,600 motorized 2- and 3-wheelers and close to 15,000 heavy trucks. Eswatini had close to 10,000 buses registered in 2011 and just under 7,000 other vehicles.

10.5% of the population owns a private passenger vehicle[36] and this number is expected to rise as part of the general increase in economic welfare in the country. The fuel consumption in 2014 was recorded to be 204.4 litre/per person/year or 10,413.14 barrels in total.[37]

At present Eswatini has no policy in place for fuel efficiency or phasing in or phasing out of fuel in-efficient vehicles.

35 Ministry of Public Works, Swaziland 2013
36 Energy Balance 2014
37 www.world.bymap.org/OilConsumption

Agriculture

The agriculture sector's share of GDP was 13% in 1989 and only 9% in 2009. However, the agriculture sector is more important for the economy than the GDP share indicates. Agricultural outputs form the raw material base for almost 1/3 of value added goods with the manufacturing sector, and contribute substantially to national export earnings. Livestock production is a major agricultural activity with small farmers owning about 77% of the total cattle population. The number of livestock has been declining due to recent droughts.

The demand forecast for the agricultural sector is based on the assumption that the sector will be modernised and prioritised as a vehicle for job creation and growth, in line with the NDP.

Industry and Mining

The industrial sector, including the mining sector, contributes to less than 15%[38] of the total energy demand in Eswatini. This share indicates an overall economic development challenge as the small share of industrial activity impacts the GDP, the employment and general prosperity. The main consumer of energy is the sugar industry.

The energy consumption by Industry is recorded as 1,859 TJ (2014)[39], mostly in the form of electricity. Commercial and Public Services are included in an "other" item which consumes 16,225 TJ, including 11,822 TJ from Biomass and Waste.

Main issues:

- Optimise and clarify long-term security of supply to allow the industrial sector to plan establishment and expansion projects.
- Facilitate net-metering as a means to increase power supply at a least cost to the national budget.
- Stimulate energy efficiency in the production lines across the industrial sector.

Commercial and Public Buildings

The commercial and public buildings sector represents less than 5% of the total energy consumption. Despite a relatively small share of the total energy consumption[40], the sector and its energy consumption performance is significant for the overall energy policy going forward.

Since the first NEP 2003 and as a result of a dedicated national electrification programme, the national electricity access in public institutions is reported to be 96% for schools and 99% for health facilities[41]. Although access has improved significantly since the NEP 2003, there are still some electricity supply issues. The frequency of interruptions has dropped over the past ten years, outages and interruption are still a challenge. Overall, 27% of rural schools and 33.5% of rural health facilitates report electricity interruptions occurring more than once a week. Despite being electrified, 82% of all schools in Eswatini report using wood-fuel for cooking.

Data on the energy pattern for the commercial building sector remains poor. This includes data on the availability of power, sufficiency of supply and energy efficiency benchmarks. The buildings sector is a well analysed sector internationally and clear benchmarks for poor, average and good performing buildings are readily available.

38 Swaziland energy balance 2014
39 Swaziland energy balance 2014
40 Swaziland energy balance 2014
41 Electricity access in public institutions and the impact of the rural electrification Project.2014 MNRE and Central Statistics Office

Main issues:

- Availability of accurate and systematic information about the energy consumption and energy needs in the sector.
- Implementing specific energy efficiency interventions based on accurate data.
- Securing quality, reliable sufficient supply of energy, including facilitating net-metering as a mean to increase power supply at a least cost to the national budget
- Capacity of government and private sector to conduct energy audits and develop a baseline on energy efficiency

Households

The household sector represents the largest user group of energy. The sector is divided between households living in extreme poverty with an estimated one third of the population being food insecure[42] and households living either as middle class or very rich households.

After focused interventions by the Government of Eswatini, the electrification rate stood at 69% nationally as at March 2016. In rural areas 55% of households have access to electricity and 84% of urban households were electrified.[43]

The main sources of energy available for households include electricity, solar, wood-fuel, LPG and paraffin.

Main issues:

- Improving the energy reliability and cost reflective affordable services to all rural, peri-urban and urban households.
- Promote the integrated use of renewable energy as a means to improving availability of power at cost reflective affordable prices.
- Promote improved energy efficiency as a means to improving affordability and increasing security of supply.
- Ensure increased availability of electricity for households to cater for households switching to increased use of electricity for cooking and lighting, and increased consumption due to general increase in household purchasing power.

42 World Food Programme "Swaziland"
43 Swaziland household energy access 2014, MNRE

3. THE NATIONAL VISION AND OVERALL ENERGY POLICY GOALS

The reviewed National Development Strategy (NDS of the Government of Eswatini,[44] which followed the framework[45] defined for this purpose, aims to achieve the following national vision:

"By the Year 2022 the Kingdom of Eswatini will have attained a level of development akin to that of developed countries while ensuring, that all citizens are able to sustainably pursue their life goals, enjoy lives of value and dignity in a safe and secure environment in line with the objectives of Sustainable Development."

According to the reviewed NDS, the energy sector should contribute to socio-economic development through:

a) Expedited research and development for better understanding of energy systems and technology development for climate change mitigation and adaptation with tertiary institutions;
b) Assessment and further strengthening of the institutional capacity in the management and development of energy as whole;
c) Investigating clean technologies for using local coal instead of imported coal;
d) Development of a resource map for energy resources for planning;
e) Assessment and promotion of the development and dissemination of appropriate renewable energy technologies;
f) Development of suitable and environment-friendly alternate energy sources;
g) Collaboration with tertiary institutions to incorporate sustainable energy issues;
h) Development of maintenance skills in the energy sector.

Concerning the current issue of power shortage in the Southern African region, the reviewed NDS states that *"Eswatini has to consider increasing her domestic energy sources of supply to reduce the vulnerability associated with imported electricity, and to increase its energy security*". The central focus of the renewed strategy will be to develop domestic power generation capacity, where economic, while at the same time using imported energy to economically achieve sustained demand and supply balance".
The reviewed NDS forms the umbrella policy for the country and provides strategic direction to a number of sectoral policies and action agendas, including the present NEP.

The NEP 2018 will prioritise the direction for the sector at the overall level and facilitate clear implementation through an update of the National Energy Policy Implementation Strategy in combination with a number of detailed sub-sector policies and strategy.

The Vision represents the fundamental aspiration of the Government of Eswatini upon which all our Energy Policy Goals shall be based:

To meet the energy needs of the Country in a sustainable manner that contributes to economic growth and wellbeing of the population.

44 Development Strategy for Swaziland Promoting Sustainable Development and Inclusive Growth, October 2014
45 A framework for National Development Strategy (NDS) Review, January 2013

This vision shall be achieved through sets of policy actions that contribute to the achievement of the five objectives:

a) Ensuring access to available and affordable energy for all
Access to energy for all individuals, entities and sectors of the economy is a commitment of the Government. Currently, there is a heavy dependency on wood in most households which causes health problems and leads to rapid deforestation.

b) Enhancing employment creation
Creation of employment is a prime element in the overall strategy on poverty reduction. Given the high level of unemployment in Swaziland, especially the youth unemployment, energy solutions should contribute to the creation of employment possibilities across our society.

c) Ensuring security of energy supply
Security of energy supply comprises both short term and long-term concerns. While the electricity supply seems secure in the short term, the supply may often still be interrupted due to faults and temporary bottlenecks. The long-term electricity supply is insecure as Swaziland currently relies on ESKOM to supply more than 80% of country's consumption. The petroleum sector is insecure in the short term already, because there is no strategic stock and the commercial stock is only sufficient to cover sometimes not even 3-5 days of supply. Establishment of a strategic oil reserve facility is essential to improve the energy security.

d) Stimulating economic growth and development
The energy sector can contribute significantly towards economic growth through initiatives that emphasizes efficiency as well as competitiveness in the energy sector management. Using less energy for the same output is a direct economic optimisation at household, institutional and productive sector level. Stimulating growth requires long-term planning and at times bold decisions.

e) Ensuring environmental and health sustainability
World-wide, energy is recognised as a main source of global pollution. The pollution is felt in many households in Eswatini caused by the intense indoor burning of wood and the effect of climate change is felt with changing weather patterns.

The NEP 2018 can be expected to achieve even better results than NEP 2003 because we can learn from the experiences and challenges faced during NEP 2003. Some of the overall ambitions include special efforts to achieve:

Adequate capacity within Ministries to plan for, lead implementation and monitor progress within the sector. This can be achieved as the following is ensured:

- Sufficient leadership with power and mandate to carry out actions as planned,
- Specific, measurable, accurate, realistic and time bound (SMART) planning of actions that is matched with a review of staff, staff competencies and budgets,
- Budgetary alignments with planned actions,
- Appropriate energy studies at institutions of higher learning.

Efficiency and sufficient supply and use of energy resources: This situation will be achieved when the Energy Sector reaches a higher level of:

- Transparency in the supply and pricing of electricity, and
- Agreed and followed goals and monitoring of energy use optimisation.

Adequate sector co-ordination and information

Optimal inclusion of other Ministries, Investors, the Private Sector and professionals who potentially can or already do operate in the energy sector will result in:

- More optimal utilisation of potentially available human, technical and financial resources and increased long-term optimal decision-making at all levels in the society due to full information about technologies and energy supply.

4 POLICY MATTERS AND STATEMENTS

4.1 ELECTRICITY

4.1.1 SECURITY OF ELECTRICITY SUPPLY

In an average hydrological year, Eswatini needs to import 80% of its electricity from South Africa, while 20% will be produced from own hydropower stations and biomass cogeneration plants. In 2016, the situation was different due to low hydropower production by SEC (only 14% was generated in the country, 10% from hydropower). There are several issues associated with this situation:

- Security of supply: in case of a major crisis or transmission line unavailability and in order to have a satisfactory power reserve, a national installed capacity of 250 MW would be needed, and an expected 460 MW[46] by 2030 considering an annual average demand growth rate of 4% and a minimum reserve of 20%. These are also minimum operational requirements within SAPP.
- The small size of the country results in local projects not benefitting from economies of scale
- High cost of peak power imports. Cheap off-peak electricity imports compared to local generation.
- Tariffs in Eswatini do not reflect the import costs as explained in Section 2.1.1.

The establishment of a national power reserve to satisfy minimum security of supply requirements implies additional investment in power generation. At present, only diesel generators installed in the country could provide such minimum reserve in the immediate to short term. Such generators could be developed and operated by SEC and/or dedicated IPPs appointed via competitive bidding.

For the immediate to short term, and while the national generation capacity is insufficient, emergency supply arrangements can be made with other SAPP utility members and the Day-Ahead Market. Longer-term deals can also be envisaged, with the objective of diversifying import options in order to enhance security of supply and also reduce import costs. Such options are possible depending on the transmission network capacity in the country and within SAPP.

In any case, the security of supply and import cost issues will likely remain for several years due to the required additional investments and the lead time necessary for planning, preparation and implementation of the generation projects. There is a need for the Government to investigate options for the short, medium and long-term in order to ensure secure supply in a sustainable manner.

Position 1: Government will ensure adequate security of electricity supply:		
1a. Set target date for constitution of adequate installed capacity and reserve, and ensure implementation.	*1b. Look for diversification of electrical power imports in the region and strengthen the national transmission network.*	*1c. Establish a national Electricity Master Plan to guide long-term electricity generation, import and export.*

4.1.2 REDUCTION OF ELECTRICITY SUPPLY COSTS

Although the cost of electricity imports from South Africa can be considered low by regional standards and for comparable countries, the price of electricity is largely unaffordable to the poor, although compensated by cross-subsidies from commercial and industrial consumers. In addition, the technical and commercial losses in transmission and distribution networks are estimated at 14% of the total supply. Although this value is low when compared to many other countries in Africa, there is a room to reduce these losses to a level of 8 – 10%.

46 Calculation by AETS as part of this Energy Policy formulation

Eswatini established SERA as an important institution to regulate and improve business transparency in the energy sector, as well as to promote fair competition for private sector participation with cost-effective procurement rules.

The international and also to some extent the private finance and donor markets are populated with finance models[47] in favour of urban, rural, off-grid energy and/or grid supplementary solutions especially geared towards renewable energies. The wealth of these options includes broad combinations of:

- Guarantees (in particular guaranteed purchase of produced electricity / energy) to reduce risks, therefore insurance costs
- Levies and taxes to reduce investment and maintenance costs,
- Subsidies finance/ blended finance/ short and long-term finance to reduce capital costs and interest rates,
- Venture and start-up capital to encourage creation of new companies and increase competition
- Access to finance also for small energy companies: several schemes are available which can encourage these companies
- Lending combined with Technical assistance: typical schemes are favoured by International Banks to help local banks finance small EE and RE projects
- Other models including “rent-to-own” and “pay-as-you-go”, which prevent the consumer from paying costly fixed charges

The cell-phone market is a prime example on how to capture and service all – rich and poor, urban and rural - with modern services.

The evidence in market research[48] is that the energy market cannot expand without a long-term clear policy framework. While the market expansion depends on access to finance, the finance is dependent on clarity of a policy direction and the communication of the policy to the market.

Eswatini follows global trends and moves towards a dynamic market with more than one generator, supplier and possibly also multiple distributers of electricity. Neither the Government of Eswatini nor SEC has necessarily sufficient available financial resources to satisfy the present demand for electricity expansion for improved national security of supply.

Allowing a broader participation in the energy sector will facilitate an equally broader participation in the mobilization of finance which could lead to long-term cost reductions. Accepting the country's macro-economic requirements, project financing which minimizes government guarantees and reduces contingent liabilities in the budget can be prioritized and sought as examples of cost reduction measures. For electricity projects this includes but is not limited to an immediate access for net-metering[49] in line with SERA overall tariff regulations.

Position 2: Government will ensure efficient and cost-effective electricity supply integrating pricing for economic efficiency and financial sector viability

47 Electrification Financing Initiative (ElectriFI) concept paper - working draft.
“Universal access to energy: Getting the framework right “Energy Policy- Volume 47, Supplement 1, Pages 1-94 (June 2012).
“Off-Grid Business Models” The climate group.org www.theclimategroup.org

48 See for example “OFF-GRID POWER AND CONNECTIVITY - PAY-AS-YOU-GO FINANCING AND-DIGITAL SUPPLY CHAINS FOR PICO-SOLAR” – Lighting Global – IFC – World Bank May 2015.

49 Mini-projects less than 100 KW

2a. Look for optimisation of local generation, imports and exports, maximising the country's economic interests.	*2b. Ensure optimisation of transmission and distribution network strengthening and development.*	*2c. Gear towards further reduction of technical and non-technical losses and improvement of demand-side management in the distribution networks.*

The Government of Eswatini is committed to optimizing the financing of the energy sector from various sources available including own fiscal resources, private sector finance and external funding. The Government of Eswatini is also exploring various sustainable means of incentivising investment in the energy sector. The Government is also committed to ensuring that procurement of new capacity is predictable, transparent and follows an approved system such as tendering.

Optimisation can include that energy projects be prioritized in a matrix according to their cost effectiveness and contribution to development priorities, including increased access as well as job opportunities, local community development, environmental impact and long-term security of supply.

4.1.3 MINIMUM 50% RENEWABLE ENERGY IN THE ELECTRICITY MIX

The Government has set a target of achieving 50% of renewable energy in the electricity mix as part of its commitments to the UNFCCC and the SE4ALL initiative.

In order to ensure that this RE target is met, Eswatini has a number of options at its disposal. The options shall be matched with the goal of increasing the self-sufficiency and other global energy planning goals.

The forthcoming Energy Master Plan will include assessed detailed plans for technology deployment. A balanced RE development including the existing 105 MW co-generation from sugar bagasse and potential 35MW from the forestry sector could be:

- Biomass-based co-generation: 140 – 165 MW
- New hydropower plants: +40 – 60 MW
- Solar PV: + 100 – 120 MW (with 5 large IPP and several smaller embedded plants)
- Wind farms; + 20 – 50 MW (with 2 to 3 main areas)

Such numbers can also be influenced by intake of net-metered PV and small hydro systems. The indicative technology targets will be further informed by the Energy Master Plan.

The main issues at present are:

- Limited knowledge of economically viable potential for each resource
- Lack of regulatory and fiscal incentives for investors
- Lack of adequate institutional and private sector capacity to plan, prepare and implement bankable RE projects

Globally, renewable energy has historically often been introduced based on a feed-in tariff model. Great successes are recorded in terms of attracting investments based on long-term attractive feed-in-tariff models. It is also evident that the feed-in tariff is expensive and it typically leads to tariff increases. Internationally,[50] combining public bidding with feed-in tariffs has seen a sharp reduction in bidding prices for both wind and solar PV. The size of the South African energy market and its renewable energy programme has the potential to influence on regional renewable energy prices.

50 Most noticeably South Africa

With South Africa's new target of 17,800 MW Renewable Energy to be procured by 2030, prices in the region can only be expected to further decrease.[51]

Through structured public tendering, Eswatini will take advantage of the price reductions already seen in the region. Eswatini's renewable and new electricity procurement is, in regional terms, small. The built price of RE projects in Eswatini will depend on the regional built price combined with methodologies used for procurement in addition to the long-term power purchase scenario. Eswatini only needs in the order of 300 MW to be self-sufficient with a production margin. All investments above this number will boost export earnings and help alleviate the electricity shortfall in the region.

Even small sub-optimal investments can affect SEC's selling price if more power plants connect to the grid without optimal pricing. Therefore, it is an energy policy priority to ensure that electricity expansion is planned and procured based on strategic medium to long-term planning. It is a firm principle that all procurement will be based on competitive bidding.

Position 3: Government will support the development of local RE sources for a target of 50% of the energy mix in the electricity generation.		
3a. Establish the potential for development of each RE technology (Hydro, Solar, Wind and Biomass).	*3b. Set binding targets to be achieved by 2030 for each technology*	*3c. Support preparation and implementation of identified RE project at short and medium term and prepare long-term development plans.*
3d. Allow for phased in net metering according to the strength of the distribution system starting with large consumers and gradually extend it to others.	*3e. Provide immediate incentives to existing industry to generate more power from bagasse and other biomass sources*	*3f. Support investors in preparation of new bankable projects and provide incentives for their development and implementation via periodic public bidding rounds.*

4.1.4 CAPACITY BUILDING IN THE ELECTRICITY SECTOR

Inadequate awareness and capacity in technical, economic and financial feasibility, available technologies and costs, and legal and regulatory incentives and/or constraints in RE sector has hindered the development of RE projects in the country. Despite the bold resolutions taken in the existing NEP (2003) the capacity of the Government for promoting RE has not shown enough progress. The potential private sector stakeholders are mostly foreign companies and despite significant investments in RE production in some South East African countries, the involvement of local developers, technology institutions and local banks in the field of RE is still limited.

Position 4: Government will plan and support a comprehensive development of national capacities in RE project preparation and implementation.	
4a. Facilitate awareness, training and capacity building of Government officials in terms of technology assessment, promotion of technical, economic and financial feasibility evaluations, legal and regulatory requirements and project implementation (Sustainable Energy Finance Facility).	*4b. Facilitate training and capacity building programmes for other stakeholders, in particular local banks, private developers and equipment suppliers.*

51 www.ipp-projects.co.za

4.1.5 FULL ACCESS TO MODERN ENERGY

The electrification rate has improved significantly since the launch of the first National Energy Policy in 2003. Focused interventions from the Government of Eswatini have contributed to the increase in the electricity access rate, which was recorded to be 72% nationally in March 2016.

In 2014,[52] the data on household electrification by region show that the three regions - Hhohho, Manzini and Lubombo - have a fairly even electrification rate and the region Shiselweni is lagging behind the national average with an average of 40% of HH being electrified.

Irrespective of the electrification rate, more than 25% of all HH and approximately 50% of all rural HH cook using wood. Increased electrification cannot change this already because of cost of electrical equipment in combination with availability of free wood, habits and possible other social reasons. The high level of consumption of wood contributes to deforestation and indoor air pollution. Eswatini has committed to the SE4ALL target and already in the NDP it is committed that access to modern energy is a high priority for the government. Modern energy can mean grid electrification but it can also mean provision of electricity from Solar Home Systems and other off-grid solutions where this is more economical. Therefore, Government will prepare an electrification plan based on least cost options to prioritise the provision of grid and off-grid solutions that meet the quality norms for provision of access.

Position 5: Government will strive to provide all HH with access to modern energy by 2022.

4.1.6 ERADICATION OF ENERGY POVERTY

While the Government through intense actions is working towards achieving access to modern energy by 2022, this does not mean that energy poverty has been eradicated. Energy poverty means that the option to choose and use modern forms of energy is restricted and prevented, either because of financial poverty or because of absence of available choices limiting human and also economic development.

As part of Eswatini's poverty reduction strategy, the Government has initiated various strategy and policy discussions to ensure that all development schemes including provision of energy for poverty stricken areas integrate conservation. Specific objectives of the rural development strategy include access to modern energy for all.

Rural Eswatini is not exclusively poor when compared to other African countries. Impressive houses with modern equipment are found across the rural areas. Small productive centres and well-working farms are also part of the rural landscape. To declare all rural land as land of poverty would lead to wrong conclusions and policies. Similarly, poor people are also located in the urban areas, and even urban areas are not free of poverty. Large proportion of the poor population live in the rural areas, but poverty exists across the nation. Going forward, the focus on solving the energy poverty is not determined by location, but by available income and living standards.

Energy poverty linked to financial poverty is seen among households all over Eswatini and mainly in rural areas where many live in extreme poverty.[53]

Even some progress in poverty reduction is unlikely to radically shift cooking patterns. Provision of grid based electricity will not stop the free use of wood. The damaging effects from heavy indoor pollution and the deforestation continue despite grid electrification, as also documented in the National Household Energy Surveys.

Reducing inhalation of harmful fumes from candles and kerosene must remain a high priority. Providing children and adults access to light (for studies and education) without risk of damaging their health is essential and

52 Swaziland households energy access 2014, MNRE
53 "Enabling rural poor to overcome poverty" www.ifad.org

provision of basic services such as charging a cell-phone and listening to radio is very important. The access to information via radio serves broader development purposes and the value of ability to charge a phone even for a few minutes of communication must not be underestimated. Therefore, access to even the most basic form for electrification satisfies important human needs other than cooking.

The technology of Solar PV is rapidly becoming more affordable and evidence from the region shows that well-off customers invest in self-reliant roof-top PV and reduce their consumption from the grid to a level of back-up, almost similar to households on lifeline tariff.

While Eswatini may be blessed with a current uninterrupted import of power from South Africa, the power short-fall within the region cannot be ignored. The industrial partners are fully aware about the situation and only through provision of security of future supply will Eswatini be able to attract long-term investments in the productive sectors. In the short term, Eswatini is not expected to experience Industrial Energy Poverty in terms of availability or choice, but a "business-as-usual" energy policy could lead to medium term energy limitations leading to "choice poverty" also among commercial and industrial businesses wishing to expand production and / or ensure 100% power stability.

Actions include provision of well-researched, structured and supported "Rent-to-own"[54], "pay-as-you-go" Solar Home Systems (SHS) throughout urban and rural areas and increased access to the grid in addition to access to gas lights. Other methodologies can be used which ensure immediate saving by the HH thus freeing up cash for candles and paraffin. This will be achieved through a number of actions including establishment of a national solar/SHS quality system and standards. Only systems that are provided with warranties and can be expanded will be allowed into the market. Similar requirements will apply for gas lights. The roll-out will be financed through a combination of existing and new funding, and the possible establishment of a revolving fund under the electrification programme.[55]

Through provision of campaigns directed towards households, it is expected that the harmful smoke in kitchens could be reduced. This includes promotion actions to build improved cook-stoves with built-in chimneys or the modern smokeless stoves. Additional focus will be directed at ensuring access to LPG and increased grid electrification. The delivery of this will involve skill development of rural entrepreneurs to produce and sell improved cook stoves, availability of LPG and access to the grid. The actions behind this also include actions towards sustainable growth of wood and monitoring of health.

A thirds set of actions include ensuring that sufficient power for the designated economic development zones is available and to establish medium and long-term power security for large industrial consumers.

Position 6: Government will strive to ensure eradication of energy poverty at all levels by 2030.		
6a. Smoke free kitchens. This includes promotion actions to build improved cook-stoves with built-in chimneys or the modern smokeless stoves.	*6b. Access to modern energy for lighting (and phone charging)*	*6c. Supply sufficient, stable modern energy to all productive sectors in the economy to enhance economic growth*

54 "Rent-to-Own" models are used all over Eastern Africa for the provision of SHS and in Eswatini the concept is well known from the Cell-phone industry.

55 "Smoke free kitchens" and "light the home" can also be part and parcel of the same programme as seen in some countries including Lesotho and Kenya.

4.1.7 ELECTRICITY FUND

Eswatini is in a process to establish a Rural Electrification Access Fund to accelerate the rate of electrification in the country. An effective and efficient institutional home is envisaged to be refined to help accelerate the broader nationwide electrification. A broader scope includes electrification of the peri-urban areas and also strengthening of urban areas electricity supply.

It is envisaged that the fund shall be refined to also address matters such as inclusion of technologies other than the grid. Off-grid solutions can at times and places be more economical and financially attractive for both consumers who do not have cash to pay for the connection fee, and for SEC. Secondly, the Fund is envisaged to elaborate the focus to support Government's position to increase the share of renewable energy to a minimum of 50%.

In order to optimize the resources available for access to modern energy, and learning from the successes from the administration of the Strategic Oil Reserve Fund, it is the intention to ensure that funding for electricity sector expansion is viewed more holistically. This includes addressing options for adding external funding from sources such as donor grants, soft loans, guarantees and many other finance mechanisms earmarked to solve strategic bottlenecks, remove barriers and create large markets in the renewable energy and energy access market.

The Electricity Fund will be used to support new Built Renewable Energy (Position 1, Position 3) and the accelerated access to modern energy (Position 5 and 6) in a manner that actively contributes to macro-economic priorities such as jobs and reduced import dependence.

Position 7: Government will ascertain options and ensure establishment of a national Electricity Fund in support of renewable energy sector and accelerated access to modern energy throughout the country.

The implementation plan includes activities such as:

- Review options for rearrangement of the existing Rural Electrification Access Fund and establishment of a new Electricity Fund.
- Ensure the Fund's mandate and operational modalities will allow acceptance of international and private finance, soft finance and grants to be pooled into the fund. At the same time, clear accountability for transparent and accountable use of the Fund shall be in place to provide comfort to external financiers.
- Ensure priorities for New Built Renewable Energy in a manner that is conducive to accelerate the entry and involvement of IPPs.

4.1.8 ENERGY EFFICIENCY (EE)

Both efficiency and energy conservation are important policy priorities in Eswatini.

The public and commercial buildings consume almost 15% of all electricity consumed in Eswatini. There is a high wastage of energy within both public and the commercial buildings emanating from sub-optimal usage of lighting, air conditioning (heating and cooling), hot water and appliances. While “business-as-usual” might seem attractive to single building owners in the short term, the wastage in this sector consumes energy that could otherwise have been available for productive actions in other sectors. In addition, energy saved is money saved and the high wastage is often a result of insufficient information about efficiency and conservation options and their benefits.

Industrial energy efficiency actions are well known and have been supported in the region for the past decade. The main areas of intervention relate to:

- Heating, ventilation & compressors
- Motor efficiency
- Boiler efficiency
- Processing efficiency
- Irrigation

Eswatini's industrial sector is under constant pressure to balance expansion plans with access to energy. Energy Efficiency interventions may at times prove to be cheaper than investments in supply expansions or "do nothing" actions. In addition, Eswatini's export industry is under regular pressure to comply with specific minimum standards to retain access to the export markets. While large multinational companies may have access to recent best practice information, the majority of Eswatini's industrial sector have limited access to information or funding.

Information and funding is often made available to the markets through collective efforts and due to its relatively small size in a global comparison, Eswatini's industry is relatively disadvantaged compared with similar industries in neighbouring countries. The consequence might often be that imports from South Africa are cheaper than local purchases. Interventions to support the local industry is a key priority for the Government of Eswatini, and energy efficiency and energy conservation are some of a number of instruments that may help and improve the local productivity.

The household sector is diverse spanning from upmarket golf-estate villas to simple mud structures. Energy efficiency and energy conservation in the household sector can be grouped into a number of clusters in particular:

- the building envelope, including the orientation of the home,
- the insulation,
- the glazing,
- the fitting of doors and windows,
- the roof's ability to let in sunlight during winter months and shield the house during summer months, and
- the flooring.

Energy efficiency and energy conservation related to the Building Envelope will be updated and improved through active use of building standards and building codes. The other clusters are light, appliances and hot water.

Eswatini's use of inefficient light bulbs undermines efforts to secure modern energy for all. A special programme will be launched to shift the use of light bulbs to efficient bulbs only.

- The energy use of the appliances cannot be changed but the Government of Eswatini can ensure that only appliances with specific energy ratings are imported into the country, thus preventing sale of substandard products. Most SADC member countries have committed to appliance standards and, as also highlighted in the SE4ALL action agenda, Eswatini will ensure that an appropriate system for appliance standards and labelling is introduced.
- The hot water in many newly electrified areas is recorded to use up to 40% of the household's electricity. The electricity consumption of a hot water system is affected by the insulation of the tank and piping and whether the installation is indoors or outdoors.
- The behaviour of the home owners includes numerous aspects from switching off lights and appliances when not in use, only boiling what is needed, cooking with lids on and many more no-cost actions.

Around the world, the incandescent bulbs either have been or are being phased out. The target from the SE4ALL is that 500,000 LED are distributed by 2019. SADC member states have agreed to the ban of the use of incandescent light bulbs by end of December, 2018.
To that effect SD is already developing regulations to phase out inefficient lighting systems. Moving into the future, free distributions of energy services and products may not be sustainable, and it is not affordable as a model for our society. The policy going forward will include dynamic market interventions such as tax incentives, promotions in collaboration with shops that promote sustainable targets, import restrictions and awareness raising. A broader intervention is viewed to achieve sustainable results and the NEP 2018 policy will endeavour to ensure achievement of targets through such broader array of interventions.

The first NEP 2003 provided strong focus to a number of energy efficiency interventions and the greatest achievement has been the initiation of the drafting of a National Energy Efficiency Policy.

Position 8: Government will ensure the launch and implementation of a National Energy Efficiency Policy and associated implementation Strategy covering all relevant sectors of the economy.

4.1.9 FURTHER LIBERALISATION OF THE ELECTRICITY MARKET

The Electricity Act (2007) reforms and consolidates the laws regulating the generation, transmission, distribution and supply of electricity in Eswatini, and sets the obligation to hold licenses for the generation, transmission, integrated operation, distribution, supply, off-grid and mini-grid supply and import or export of electricity. It also defines, in particular, the tendering procedure for the procurement of new generation, transmission and distribution capacity, as well as the tariff regulation principles. The Electricity Act also states that Government will undertake to promote, support and provide rural electrification programmes through public and private sector participation.

A significant barrier to the development of electricity investments by the private sector in Eswatini is the prevailing dominance of SEC in the generation, transmission, distribution, supply and import of electricity, even after the revised SEC Act (2007) which removed its monopoly status. Another barrier is the current limitations in transparent information on the distribution of costs in the electricity supply chain.

Furthermore, since NEP 2003 it has been a policy of the Government to promote and encourage access to affordable energy services for low-income groups. A lifeline tariff is established to cater for the most vulnerable groups. Future systematic and visible awareness raising about this tariff is envisaged to facilitate a wider number of vulnerable households to access basic affordable energy services. A further differentiation in consumer tariff between low/middle-income and high-income groups can also be considered. In addition, the time-of-use tariff currently does not reflect the price of imported electricity, causing the SEC to supply electricity below production or purchase price during peak times.

Since April 2017, Government of Eswatini introduced an Electricity Levy that contributes to a Rural Electrification Access Fund. The use of the Rural Access Fund must contribute to greater energization across the country for all user groups, including those without access to modern energy.

Position 9: Government will facilitate the further liberalisation of the electricity market.	
9a. Review adjustments in policy, legislation, regulations, guidelines, rules, codes and methodologies, and establish relevant organisations, work plans and operational protocols to facilitate the liberalised electricity market.	*9b. Ensure financial ring-fencing of SEC for generation and transmission / distribution of electricity by 2018.*

4.1.10 ACCESS OF IPPS TO THE ELECTRICITY MARKET

The IPP Policy (2015) provides a framework that addresses barriers to the development of electricity generation, in order to enable a successful transition towards sustainable energy sources and to open the market to the private sector in a controlled way. The overall national goal is defined as:

"Ensuring that the development goals of the country as set out in the Vision of the NDS are met, through the establishment of an enabling environment to promote the establishment of sustainable renewable energy and IPP generation sources for the benefit of all the citizens of the country."

A total of 28 policy issues, recommendation and positions have been set in the IPP Policy, concerning the following key themes:

a) Institutional and Regulatory Framework;
b) Power Sector Planning;
c) Capacity Procurement;
d) Funding and Bankability;
e) Taxes and Incentives;
f) Regional Integration;
g) Rural Electrification and Mini-grids;
h) Embedded Generation.

It is now a priority to apply the IPP Policy framework in facilitating the access of IPPs in the electricity market, in a gradual manner so as to stimulate the market without leading to sudden large increase in the electricity tariff.

Eswatini has historically benefitted from relatively low import tariffs under the Power Purchase Agreement with Eskom. Due to the structure of the local tariff and the size of the economy, IPPs face the difficult challenge of having to propose tariffs at par with the Eskom PPA prices. Another significant barrier to the entry of IPPs in Eswatini's electricity market is that consumer tariffs are not cost reflective. A tariff subsidy framework has been historically practiced from the industrial and commercial sectors to households, despite the following tariff regulation principles defined in the Electricity Act:

- Allow a licencee that operates efficiently to recover the full costs of its business activities, including a reasonable return on the capital invested in business;
- Provide incentives for the continued improvement of the technical and ecpnomic efficiency with which the services are provided;
- Provide incentives for the continued improvement of quality services;
- Give to consumers proper signals regarding the costs that their consumption imposes on the business of the licencee;
- Avoid undue discrimination between consumers and comsumer categories.

55 Tariff increases are un-avoidable to accommodate maintenance, all new built and imported electricity

The cost of grid expansion and maintenance is currently not matched against the costs of off-grid and mini-grid electrification systems as a method to optimize electrification choice in a least cost/benefit matrix.

Another barrier to the entry of IPPs in the electricity market is VAT. Sale of electricity is exempt from VAT as per Amendment March 29th 2012 Schedule 2 (c) to the Value Added Tax Act of 2011. However, import of equipment for electricity production, such as motors, boilers, PV panels and biogas digesters as parts or full equipment, is not exempt from VAT. IPPs, be it renewable energy producers or conventional energy producers, will in the current situation have to absorb the 14% VAT from import into their project expenditures, as they cannot pass on the VAT through sale. This inevitably leads to increased electricity sales prices hikes. A status quo would work against the intentions of the IPP Policy and the drive to create local jobs in Eswatini.

Position 10: Government will facilitate the access of IPPs in the electricity market through an effective regulatory framework.		
10a. Develop rules, codes, standards and other templates necessary for licencing electricity investments.	*10b. Elevate the consumer tariff subsidy into a legal instrument, aiming towards the gradual removal of subsidies by 2025.*	*10c. Move the sale of electricity from the First Schedule Exempt Goods and services to Second Schedule Zero Rated goods and services by 2018.*

4.1.11 STANDARDS, SAFETY AND QUALITY IN THE ELECTRICAL SECTOR

Eswatini wishes to fully comply with and support global drives towards clean energies. The Government is committed to working towards ensuring that appropriate regulations are in place to protect the environment.

In order to protect national consumers and the environment and based on the mandate of NEP 2018, the Government will work to ensure that only products meeting local specifications and standards are imported. In opening the Renewable Energy and Energy Efficiency markets, the Government, while leaving the product choices to the market players, will support sufficient market volume to warrant setting and upholding of local standards.

The quality of all renewable energy (Hydro, Solar, Wind and Biomass), and energy efficient technologies is key in ensuring sustainability and ease of uptake of these products by the consumers. Going hand in hand with the country's commitment to the efforts of the United Nations Framework Convention on Climate Change (UNFCCC) to combat climate change, quality plays a pivotal role in protecting the environment, whilst ensuring value for money across the energy sector.

Published and enforced standards and regulations will give consumers an assurance that the imported electrical, renewable energy and energy efficiency products will perform as presented and not fail while still under warranty or even be a danger to the user.

Position 11: Government will ensure that appropriate local standards are established for relevant RE and EE technologies to enhance ease of trade and ensure safe and relevant quality to the consumers.

4.2 PETROLEUM SECTOR

4.2.1 SECURITY OF PETROLEUM SUPPLY

All petroleum products are imported from neighbouring countries. There are no known exploitable petroleum products inside Eswatini.

Eswatini currently has no national strategic petroleum storage and also no significant actual or legislated commercial storage. This renders the supply situation at risk and the situation is not in line with our SADC commitments of 90 days of strategic stocks over and above commercial stocks.

It is a priority in the immediate to short term to improve the situation around stock and ensure safe storage capacity inside Eswatini. Government will ensure, through public procurement, that a strategic storage facility is established and in operation by 2020. In parallel, the Government, through regulatory means, will ensure that all commercial wholesalers are obliged and enforced to hold an agreed number of days of commercial stocks.

Position 12: Government will ensure security of petroleum supply through establishment of national strategic petroleum stock storage and enforcement of commercial storage.

4.2.2 MANDATORY FUEL BLENDING

Eswatini has a well-established sugar industry that has successfully embarked on ethanol production as a means to enhancing profitability in the industry, creating local jobs and contributing to the reduction of harmful emissions from the petroleum fuels. After the successful implementation of the pilot anhydrous ethanol production during NEP 2003, all production related testing has now been completed. The sugar industry is ready to roll-out large-scale production of ethanol and the Government of Eswatini sees such initiative as ideal to reduce the dependency on import, increase local productive activities and reduce emissions.

The wholesale industry is committed to embracing the uptake of fuel blending from own storage facilities inside the country. In addition to the commercial blending, Eswatini will also explore strategic storage of minimum stock of ethanol.

The price of blended petroleum product will follow the existing pricing structure and it is envisaged the first official price and phasing in of fuel blending will be established by 2020.

Position 13: Government will introduce mandatory fuel blending up to 10% by 2030.

4.2.3 REGULATORY FRAMEWORK FOR THE PETROLEUM MARKET

The Petroleum Bill consolidates and updates the law of Eswatini for the reconnaissance, exploration, production, refining, storage, wholesale and retail distribution and disposal of petroleum, aiming to address the following issues:

a) Regulation and deregulation of the oil industry;
b) Ensuring adequate product availability in rural areas;
c) Ensuring stable and reliable product availability for the country's economy;
d) Achieving regional competitiveness and fair pricing of petroleum fuels;
e) Encouraging meaningful and sustainable participation of locals in the oil industry;
f) Imposition of levies and taxes on petroleum products;
g) Administration of the Strategic Oil Reserve Fund for financing any increase in the cost of purchasing fuel;
h) Development of liquid biofuels;
i) Provision of information concerning motor vehicles.

The Petroleum Bill declares the establishment of a national oil company to source, manage and distribute strategic oil stocks and also trade in crude oil and petroleum products. It also declares the appointment of a Fuel Price Controller assigned to set the prices and oversee the implementation hereof, as well as to determine the return on investment.

There is an important need for transparent and effective regulation of the petroleum market in Eswatini. The basic principles must be transparency, security of supply, safety, environmental protection and fair pricing. This also includes and is not limited to important petroleum retail issues such as licencing, balanced national coverage with retail stations, cost reflective fuel pricing and fuel taxation that need analysis and regulation.

Position 14: Government will ensure transparent governance of the petroleum market through an effective regulatory framework.	
14a. Ensure the development of detailed regulations related to the Petroleum Bill.	*14b. Empower SERA to regulate the petroleum sector once the Petroleum Bill is enacted, starting with granting licences for bulk storage, pipelines and associated tariffs.*

4.2.4 COORDINATION, CLARITY AND SAFE OPERATIONS IN THE PETROLEUM SECTOR

The Petroleum Sector impacts and works with a number of cross sectors such as the environment sector, the transport sector and the retail industry

Considering the sector as a whole, there are opportunities for job creation and economic optimisation that are missed because key decision making in the industry is not fully based in Eswatini. This includes the transport of petroleum products and the services related to the petroleum products. Considering the upcoming mandatory blending (Position 12), additional stakeholders will be active in the sector.

If unattended, these matters will lead to suboptimal deliveries in the petroleum sector affecting service, price and profits. The following position is developed in the interest of all stakeholders involved.

Position 15: The Ministry of Natural Resources and Energy will initiate an increased coordination, clarity and safe operations in the petroleum sector between Ministries and between the wholesale and retail industry partners.
15.a. The Government will facilitate through regulations clear thresholds for wholesale and retail sales as a means to safeguarding earnings in the entire industry.

4.2.5 STRATEGIC OIL RESERVE FUND

The Strategic Oil Reserve Fund serves to maintain a steady price regime and cushion the population and industrial consumers from rapid petroleum price shocks and changes. It is also used to fund the analysis of petroleum sector policy matters.

The Strategic Oil Reserve Fund has been governed transparently and efficiently in Eswatini since 1979. Being an insignificant partner in the global oil industry, Eswatini intends to remain committed to be able to cushion the price when needed. Eswatini is likely to move towards a more market reflective price that is announced at fixed intervals. Such alignments will provide greater stability for the market participants as they will be ready to handle price adjustments at agreed intervals.

The Strategic Oil Reserve Fund is also important for endeavours to establish a locally based clean fuel industry.

Position 16: Government will ensure continued transparent governance of the Strategic Oil Reserve Fund to finance any increases in the cost of purchasing fuel, and to promote the use of clean fuels.

The Strategic Oil Reserve Fund will continue be administered efficiently.. It will be used for strategic actions including, but not limited to:

- ✓ Price fluctuation cushioning;
- ✓ Clean fuel programmes;
- ✓ Environmental protection;
- ✓ Testing of fuel quality and volume monitoring;
- ✓ Fuel subscriptions;
- ✓ Petroleum related studies;
- ✓ Capacity building.
- ✓

4.2.6 PETROLEUM LEVIES AND TAXATION

The MNRE determines the price of petrol, diesel and paraffin. In setting the retail price, the Ministry takes into consideration several factors such as international product prices, exchange rate fluctuations, Strategic Oil Reserve Fund balance, significant local economic activities and product retails prices in neighbouring countries.

In line with global commitments, it is also important for Eswatini to progressively promote and introduce cleaner fuels. One such example is the phase out of high sulphur diesel and exploration of opportunities to replace paraffin. Evidence shows that paraffin continues to have serious health impacts on users and the current waiving of tax on paraffin is therefore in contrast to the broader wishes of the Government. This policy position therefore needs to be reviewed in line with the move to promote cleaner and more efficient fuels such as LPG. Furthermore, sales statistics on paraffin indicates that the tax benefit is being realized the most by industries such as bakeries rather than households. Households outside of the urban area often purchase paraffin at prices far higher than the regulated price due to high cost of distributing low volumes of the product.

Successful launch and uptake of blended fuel may depend on an attractive price regime ensuring that a blended product is cheaper or at least not more expensive than the not blended products. The use of levies and taxations are key instruments to support Governments intentions.

Position 17 Government will ensure petroleum pricing and taxation in line with cross cutting policies including environmental obligation and access to energy for all.

This will include setting of attractive price that will encourage production and blending and it will also involve actions such as review of the price model for petroleum to factor in elements that can enhance local job creation.

4.2.7 INCREASED AVAILABILITY OF LPG

LPG is a cleaner fuel for cooking purposes compared with unsustainable wood fuel. LPG remains an option for cooking and heating water both in households and for industries (Hospitality Sector). LPG is therefore an attractive fuel source to boost diversity of energy products in the market place.

Despite the potential attraction of LPG, there is a very small penetration and use of LPG in Eswatini. The barriers to LPG uptake are divided into three categories: accessibility, affordability and acceptability. Accessibility and affordability are closely linked, in that the supply chain issues inhibiting access to LPG also tend to push up the price, so rendering it unaffordable for low and middle-income households. While petroleum product prices are fixed by the Government there is at present no regulation at all for LPG. Absence of price regulation, combined with limited accessibility of the products, could potentially contribute to uncontrolled increases in prices. In addition, a bigger barrier to affordability of the LPG itself is the price of the associated equipment required to use LPG, such as cylinders, stoves and water heaters. The Ministry will continue to research and where applicable make use of international best practices to curb high prices for gas cylinders, and explore funding models that subsidise the cylinders or pricing mechanisms that allow for charges on fuel to cater for costs of cylinders.

The low uptake of LPG relates to issues of price, availability and also safety. Government will put measures in place to ensure that all products are safe and that safety related to the use of LPG is communicated to the public. All in all, the barriers preventing a large-scale uptake of LPG can be overcome through strategic, focused and combined efforts by the Ministry and the industry stakeholders. Safe storage and use of LPG is fundamental to achieve increased uptake of LPG. This includes aspects of regulations, best practice, technology choices and significant information sharing.Intensification of awareness raising on the practical and safe use of LPG can help change perceptions. National support for development of safety standards and specifications on LPG cylinders and equipment to guide the operations of the industry will also help reduce current risks.

Position 18: Government will promote and ensure increased accessibility and acceptability of LPG as an alternative modern source of energy for all demand sectors.	
18a.MNRE will in the short run ascertain options and possibilities of regulation of the maximum retail price of LPG to ensure affordability of this energy source for broad segments of household and industries.	*18b.Through formation of an effective LPG association, communication forum and platforms will be established and systematic and consistent communication and awareness campaigns will be designed and implemented by the industry and public partners.*

4.2.8 NATURAL GAS

Eswatini has no known exploitable gas resources. However, some of the countries of the region are well endowed with economically and commercially viable Natural Gas resources, in particular Mozambique. According to preliminary discussions, this country could provide Natural Gas supply to Eswatini, provided that there is a viable demand.

Natural Gas is a cleaner technology than coal and it could present an attractive option for diversification of energy supply. In addition, Natural Gas renders itself ideal in combination with a number of RE technologies because of its baseload capability and quick start-up ability. It is therefore relevant to assess the potential demand for Natural Gas in various economic sectors, including the industries and the electricity generation. Natural Gas can reduce the dependence on imported petroleum products for the industry, and could provide alternatives to increase our national power generation capacity and our security of electricity supply.

Position 19: The Government will explore options to include Natural Gas in the energy mix.

4.2.9 CLEANER PETROLEUM AND SAFETY

The clean fuels strategy is adopted by SACU member states in an effort to reduce air pollution because the burning of fossil fuels (in particular petroleum products in the transport industry) has played a considerably large role in contributing towards air pollution. This has led to the introduction of several vehicle emission control technologies, such as catalytic converters and diesel particulate filters. There has also been an introduction of cleaner fuels.

Other strategies that can be introduced include promotion of car-pooling, traffic management strategies such as more efficient public transport and bicycle lanes.

Being a net importer of petroleum products, Eswatini has been guided by the South African Petroleum Industry Association which has a clean fuels programme and a roadmap which commenced in 2006 with the phase out of leaded petrol and introduction of unleaded petrol and low sulphur diesel (reduction from a maximum of 3,000ppm to 500ppm, and now niche grades of 50ppm and 10ppm are being introduced).
South Africa has introduced Clean Fuels II through a gazette in June 2012, which indicated that it would come into force on 1 July 2017. These regulations aim to reduce sulphur levels in both petrol and diesel to 10ppm. The gazette also calls for conformation to national standards for petrol and diesel. In Eswatini, we can adopt a compliance with best practices as a relatively simple way to secure significant improvement in air quality and pollutant reductions.

The same principle can be adopted for other fossil fuels such as coal. In line with our commitments under the Intended Nationally Declared Contributions (INDC) and in compliance with air pollution regulations, it is important to define the use of the Strategic Oil Reserve Fund and the Rural Electrification Fund (Energy Fund) to actively promote clean fuels.

Position 20: Government will ensure that Eswatini adopts and oversees enforcement of a clean fuel target to reduce sulphur levels in both petrol and diesel in line with the regional targets and standards.

5 OVERALL AND CROSS CUTTING ISSUES

5.1 ENERGY AND NATIONAL PRIORITIES

As a member of the international community, Eswatini is committed to the achievement of the Sustainable Development Goals (SDG). Energy plays a significant role in achieving broader development priorities. As part of NEP 2018, the Government of Eswatini is committed to striving towards achieving a number of national development goals. A few of the goals are highlighted below.

- ***Eradicate extreme poverty and hunger***: Energy inputs such as electricity and fuels are essential for creating jobs, industrial activities, transportation, commerce, micro enterprises and agriculture. To meet human nutritional needs, almost all staple foods must be cooked which requires heat and fuels. Therefore, sustainable access to modern fuels is essential.
- **Achieve universal primary education:** To attract teachers to rural areas and teach children using modern platforms via the internet, electricity, either grid based or off-grid is essential. During NEP 2003, remarkable progress has been made, achieving an almost 100% electrification rate in schools. The Government will continue to prioritise that the remaining approximately 1 per cent of schools receive access to electricity. These are typically new or rebuilt schools.
- **Reduce child mortality:** Access to clean or boiled water, cooked food and a smoke free environment is key to improved health for children. The respiratory problems caused by inhalation of smoke are significant and avoidable. In 2015, Eswatini child mortality rate for under five-year olds was 60 in 1000, with significantly higher mortality rate for children from mothers with no education compared with mothers with education.
- **Combat HIV/AIDS, malaria, TB and other diseases:** Availability of power for radios and TVs are important for communicating national messages and information related to safe practices, and living with and among sick people. Illumination, sterilization and refrigeration are all essential necessities to reduce infection rates and mortalities.

The means to achieving the cross cutting goals include overall national energy planning and development of functional energy model to help guide the broad plans. In addition there will be actions towards achieving systematic rural energization and acceleration of rural productive centres with abundance of electrical power.

5.2 ENERGY AND CLIMATE CHANGE

Eswatini's GHG emissions in a global perspective are minute, contributing only around 0.002% of the global emissions.[57] Yet at the local level the impact of Climate Change is significant and observed in the form of changing rain, temperature and more severe storm patterns. Over and above the required adaptation efforts, Eswatini has committed to national mitigation efforts. Energy contributes to about a third of the national GHG emissions. The emissions arise from the industrial energy processes, and household use of unsustainable wood, charcoal and fossil liquid fuels as well as from the transport sector. The emissions from electricity generation will rise if the 300MW coal power plant (Lubombo) is built.

Use of clean coal technology will reduce the otherwise further rise in CO_2 emissions and Eswatini will experience increased pressure on the water resources irrespective of the coal technology used. Staying committed to our already agreed target of a minimum 50% renewable energy by 2030 allows us alternative

56 http://www.indexmundi.com/facts/swaziland/mortality-rateEstimates developed by the UN Inter-agency Group for Child Mortality Estimation (UNICEF, WHO, World Bank, UN DESA Population Division) at www.childmortality.org.

57 Swaziland's Third National Communication to the United Nations Framework Convention on Climate Change. April 2016

solutions including matching all coal generation with sufficient MW renewable energy to keep Eswatini on track of both the renewable energy as well as emissions targets.

GHG emissions from the use of unsustainable wood, kerosene and paraffin by households may seem insignificant in global numbers. Yet the impact is very direct and negative for all individuals cooking and living in homes filled with smoke and fumes. The Government of Eswatini is committed to improving the lives of all citizens including those who need assistance to remove smoke from cooking out of the kitchens.

The transport sector's contribution to GHG emissions is envisaged to increase over the next decade as more and more HH purchase cars as mobility increases. The increase in GHG emissions is also due to the fact that the majority of the additional cars entering Eswatini are used cars, as opposed to entirely news cars, of which emissions tend to be lower. The roll-out of mandatory ethanol blending will reduce the otherwise increase in transport related GHG emissions. Eswatini has currently no reliable forecast for expected future GHG emissions.

Eswatini will monitor the trends from China, France and the UK who have all set targets for phasing out the petrol and diesel cars. Appropriate action will be taken to align Eswatini with relevant regional phasing out targets that may be relevant in the long run.

Eswatini is foreseen to stay committed to the UNFCCC's efforts to combat climate change and the energy policy and actions will therefore remain aligned to these goals and the SDGs.

5.3 ENERGY AND EDUCATION

The school curriculum must at all times be reflective of Governments policies including the Energy Vision 2018. Matters relating to energy's impact on the environment, energy conservation and energy efficiency shall be appropriately integrated in the curriculum at primary school level. Options exist to run annual school competitions for innovative energy solutions and energy efficiency.

5.4 GENDER

The link between Energy and Gender is significant at the household level where women in poorer households spend time collecting wood for cooking. Despite increased electrification, over 70% of rural and 10% of urban households still use wood for cooking and most wood (more than 70% on average) is collected from common land.[58]

Many women and children also spend hours a day in a smoke-filled kitchen while cooking which can result in an increased occurrence of respiratory, lung and general health problems. Similar problems can be observed among institutions, prisons and compound facilities that cook on traditional stoves.

In terms of the energy sector, Eswatini is committed to contributing to actual transformation of past gender inequalities. The goal for Eswatini is to see an equal participation of women and men in the productive energy space. We will achieve this by setting clear gender balancing targets for our energy sub-sectors and actively strive to monitor these targets.

To ensure that our efforts are meaningful and effective, special communication actions directed towards achieving greater gender balance will be prioritized.

58 "Swaziland Households energy access", 2014. Energy Department MNRE

As for gender actions, the NEP 2018 will strive to reduce gender inequalities in the energy sector by:

1. **Improving gender equality and empowering women** by reducing negative impact on health by means of taking smoke out of the kitchens and reducing time spent collecting wood for cooking and heating. Freeing up time allows women to engage in productive activities such as crop production and handicraft.

2. **Establishing targets for gender balanced participation** in the energy sector and ensuring systematic monitoring hereof.

3. **Establishing and maintaining national stakeholder forum and promotional communication** to systematically move the gender agenda forward and promote options for increased gender equality.

Policy position 21.a Government will promote alleviation of poverty through means of energy provision
Policy position 21.b Government will improve gender equality throughout the energy sector

6 LEGAL AND REGULATORY FRAMEWORK

6.1 LEGAL FRAMEWORK

The current legal framework governing the energy sector of Eswatini includes the following main elements:

1. Electricity Act 2007;
2. Swaziland Electricity Company Act 2007
3. Energy Regulatory Act 2007;
4. Petroleum Bill.

6.1.1 ELECTRICITY ACT

The Electricity Act reforms[59] and consolidates the laws regulating the generation, transmission, distribution and supply of electricity in Eswatini , and sets the obligation to hold licenses for the generation, transmission, integrated operation, distribution, supply, off-grid and mini-grid supply and import or export of electricity. The Electricity Act also in particular defines the tendering procedure for the procurement of new generation, transmission and distribution capacity.

The Electricity Act further defines the following tariff regulation principles:

a) Allow a licencee that operates efficiently to recover the full costs of its business activities, including a reasonable return on the capital invested in business;
b) Provide incentives for the continued improvement of the technical and economic efficiency with which the services are provided;
c) Provide incentives for the continued improvement of quality services;
d) Give to consumers proper signals regarding the costs that their consumption imposes on the business of the licencee;
e) Avoid undue discrimination between consumers and comsumer categories.

Finally, the Electricity Act also states that Government will undertake to promote, support and provide rural electrification programmes through public and private sector participation in order to:

- ✓ Achieve equitable regional distribution access to electricity;
- ✓ Maximise the economic, social and environmental benefits of rural electrification subsidies;
- ✓ Promote expansion of the grid and development of off-grid electrification;
- ✓ Stimulate innovations among suppliers;

6.1.2 ENERGY REGULATORY ACT

The Energy Regulatory Act[60] allowed the establishment of the Swaziland Energy Regulatory Authority (SERA) with the mandate to administer the Electricity Act. The functions of SERA include and are not limited to:

- Issue licenses for undertakings in the energy sector;
- Make and enforce directions to ensure compliance with licenses issued;
- Regulate and approve tariffs provided by licenced entities;
- Investigate complaints from consumers on price adjustments or services provided;
- Develop and enforce performance standards for the licenced activities;
- Encourage the development of uniform industry standards and codes of conduct;

59 The Electricity Act, 2007
60 The Energy Regulatory Act, 2007

- Promote consumer awareness and education in the energy sector;
- Verify plans of energy consumption, production, transmission and distribution, including associated investments;
- Establish controls to ensure legitimate competition in energy production and distribution activities; and

SERA has already developed codes for grid network, operations and metering, the market, renewable power plants, information exchanges and governance, but the Energy Regulatory Act is not yet fully enforced. Its degree of enforcement must increase in line with developments in the liberalisation of the energy market in Eswatini.

6.1.3 PETROLEUM BILL

The Petroleum Bill[61] consolidates and updates the law of Eswatini for the reconnaissance, exploration, production, refining, storage, wholesale and retail distribution and disposal of petroleum, aiming to address the following issues:

- Regulation and deregulation of the oil industry;
- Ensuring adequate product availability in rural areas;
- Ensuring stable and reliable product availability for the country's economy;
- Achieving regional competitiveness and fair pricing of petroleum fuels;
- Encouraging meaningful and sustainable participation of locals in the oil industry;
- Imposition of levies and taxes on petroleum products;
- Administration of the Strategic Oil Reserve Fund for financing any increase in the cost of purchasing fuel; and
- Development of liquid biofuels;

The Petroleum Bill declares the establishment of a national oil company to source manage and distribute strategic oil stocks and also trade in crude oil and petroleum products. It also declares the appointment of a Fuel Price Controller assigned to set the prices and oversee the implementation hereof as well as determine the return on investment.

The Petroleum Bill is still primarily a consolidation of the law, and does not yet fully address all issues leading to a reformed and liberalised petroleum sector in Eswatini.

6.2 REGULATORY FRAMEWORK

The regulatory framework leading to the liberalisation and efficiency of the energy sector in Eswatini includes the following main elements, analysed next:

1. Swaziland Independent Power Producer (SIPP) Policy;
2. Key Responsibilities for Electricity Market Liberalisation;
3. The way forward for the Petroleum Sector.

6.2.1 SWAZILAND INDEPENDENT POWER PRODUCER (IPP) POLICY

The Eswatini ISIPP[62] Policy provides a framework that addresses barriers to the development of energy generation and the growth of IPP, in order to enable a successful transition of Eswatini's energy matrix towards sustainable energy sources and to open the market to the private sector in a controlled way.

61 The Petroleum Bill (*2016 draft version, at the stage of review by the Attorney General*)
62 Swaziland Independent Power Producer Policy (*approved July 2015 version*)

6.2.2 KEY RESPONSIBILITIES FOR ELECTRICITY MARKET LIBERALISATION

A number of Government organisations have a role to play in forwarding the liberalisation of the electricity market in Eswatini. The main actors are MNRE, SERA, SEC, SIPA and the Ministry of Finance. A number of organisations also have an important role to play in facilitating the necessary environmental approvals, permits, licences and rights for new investments in accordance with the the environmental law of Eswatini,[63] e.g. the Swaziland Environment Authority and the Land Management Board.

The key roles of the energy sector organisations must evolve as summarised in the table below in order to facilitate developments in the liberalisation of the energy sector in Eswatini.

6.6.3 THE WAY FORWARD FOR THE PETROLEUM SECTOR

The petroleum wholesale industry, currently governed by the MNRE, will continue to trade in a competitive market, purchasing either through direct imports or via the upcoming national depot and selling to Eswatini's retail market. Transparency will increase in the governance of the petroleum sector, in line with the Southern African Customs Union (SACU).

63 Compendium of Environmental Laws of Swaziland, Swaziland Environment Authority (SEA), 2005

Organisation	Current Role	Evolving Role
MNRE	Vision to create a conducive environment that promotes the efficient and effective utilization, beneficiation and management of natural resources in the country. Mission to ensure the sustainable development, use and management of natural resources by providing adequate services to the public and private sector in a transparent manner. Energy Department's specific mission to effectively manage the national energy resources and work towards affordable and sustainable energy provision for all the people, whilst ensuring the international competitiveness of the energy sector.	Taking into consideration that energy is particularly important for achieving the Sustainable Development Goals (SDGs) and Poverty Alleviation Strategy, access to energy is crucial for the achievement of a number of SDGs, and that available energy services are not sufficient to meet the needs of the poor, the role evolves into: a) Increase access to energy sources, energy efficiency and the use of renewable energy, and facilitate the liberalisation of the energy market in order to expand the provision of energy services for the poor. b) Establish and coordinate the development actions related to all energy sectors, including petroleum, electricity, rural electrification, renewable energy and energy efficiency.
SERA	Established in order to put in place the regulatory framework, issue electricity production *licenses*, regulate electricity *tariffs* and oversee the *deregulation* of the electricity industry. Mission to promote a viable and sustainable energy industry in Eswatini through efficient and effective regulation.	Fulfill full regulatory role in a liberalized market for the electricity, petroleum and overall energy sector : a) Enhance competition (*licenses*); b) Ensure competitive prices (*tariffs*); c) Provide a real level-playing field for market players (*deregulation*); d) Eliminate market deficiencies; e) Prevent cross-subsiding between regulated and non-regulated services; f) Increase standards of service for customers; g) Provide incentives for investment; h) Ensure security of supply.
SEC	Established in order to generate, transmit and distribute electricity in Eswatini. Mission to meet the needs of customers in a sufficiently profitable and environmentally sound way through providing a reliable and safe power supply of acceptable quality.	Proceed speedily with full financial ringfencing into the generation and transmission / distribution elements. ***In parallel, undertake a study of ownership options for SEC in order to decide the next unbudling stage (management, ownership or legal unbundling).***

7 INSTITUTIONAL MATTERS, STAKEHOLDERS AND COMMUNICATION

7.1 PARTNERS AND STAKEHOLDERS

7.1.1 THE MINISTRY OF NATURAL RESOURCES AND ENERGY

The Energy Department under the Ministry is organized into four divisions:

- ✓ Regulation of energy industry
- ✓ Petroleum sector
- ✓ Electricity, and
- ✓ Renewables

The Department's current structure is no longer in full alignment with the updated structures in the energy sector separating the policy and enforcement powers. For example, the regulation of the electricity sector has been moved to the SERA while the Petroleum Sector is currently regulated by the Department. The Department governs policies for the Petroleum Sector yet at the same time the Department undertakes compliance inspections at wholesale and petrol distribution points.

The Department of Energy has no recognised sections or dedicated staff addressing functions such as:

- o Energy policy,
- o Domestic electricity trade and international (trade) agreements,
- o Pricing and affordability,
- o Coal,
- o Energy data and monitoring,
- o Energy communication and information, and
- o Awareness raising and education.

Absence of sufficient number of assigned staff hampers optimal service delivery and the achievement of NEP II policy positions. To address the apparent and possible future organisational inefficiencies systematic Capacity Assessments are planned for the electricity and the petroleum sector not only for the Ministry but for the sectors as a whole. The capacity of the Department must be viewed holistically and match the needs, expectations and functions of its partners.

The organisation plan will be reviewed taking realistic finance into account and therefore also plan for extensive inclusion of external resources such as national stakeholders as and where needed. The organisation plan will be updated taking Leadership, Staff and staff skills, resources, structures and systems as well as external networks into consideration.

7.1.2 THE ENERGY REGULATOR

SERA is a statutory Energy Regulatory Body established through the Energy Regulatory Act, 2007 (Act No.2 of 2007). The Mandate of SERA is the administration of Electricity Act, 2007 (Act No.3 of 2007), with the primary and core responsibilities of exercising control over the electricity supply industry and regulation of generation, transmission, distribution, supply, use, import and export of electricity in Eswatini. It is also responsible for the regulation of electricity tariffs and quality of supply and services. The Electricity Act requires that prices are regulated in accordance with a defined and approved tariff methodology. The Authority is a “Category A” enterprise as per the Public Enterprise Unit Control and Monitoring Act, 1989.

Contrary to best practices within the SADC member states, SERA currently does not regulate the Petroleum Sector. The Petroleum Sector is regulated by the MNRE, which thus holds both the policy and regulatory function for this sector.

SERA's role is at present classified below the status of SEC which hampers execution of the functions as they fail to attract sufficient qualified staff. As a regulatory body, SERA need to be able to recruit and retain highly skilled and qualified staff.

7.1.3 PETROLEUM SECTOR WHOLESALE AND DISTRIBUTION

There are currently four active and a number of inactive wholesale companies operating in Eswatini via international main offices. From a security and communication point of view, NEP 2018 will ensure that all wholesalers have offices in Eswatini and are reachable via Eswatini communication tools.

The service stations hold trading license and most are linked with one of the operating wholesale companies. Most owners of Service Stations are member[64] of Swaziland Fuel Retailers Association.

The Department of Energy regulates the Petroleum Industry in line with the Petroleum Bill and is accordingly responsible for the communication between the petroleum industry and the Government.

7.1.4 ELECTRICITY SECTOR, ENERGY PRODUCERS AND SUPPLIERS, SYSTEM OPERATOR AND TRADER

The Swaziland Electricity Company (SEC) is a limited liability company fully owned by the Government of Eswatini. SEC is incorporated and domiciled in the Kingdom of Eswatini. SEC was established in 1963 as a parastatal and recently started operating in a partly liberalized market through the Electricity Company Act (2007), The Energy Regulatory Authority Act (2007), as well as The Public Enterprises (Control and Monitoring) Act of 1989.

SEC is currently a vertically integrated entity with a mandate for generation, transmission and distribution of electricity. SEC also performs the function of system operator and trade.

Eswatini has a handful of existing and upcoming independent power generators. This number is expected to rise as part of the liberalisation of the sector over the next decade.

7.1.5 PARTNER MINISTRIES AND DEPARTMENTS

Ministry of Finance: The mandate of the Ministry is to oversee the nationally financial safe operation of the energy sector including management of VAT, taxes and duties related to the petroleum and electricity sector. The Ministry is an important partner in the effort to boost local job creation in the energy sector.

Ministry of Economic Planning: The mandate of the Ministry is to assist the Government in the formulation, co-ordination and implementation of economic policies and intervention measures that will effectively and efficiently accomplish the country's major economic and development objectives.
The mission of the Ministry is to promote sound macro-economic management that will provide an enabling environment for sustainable economic growth and efficient and cost-effective delivery of services.

The Ministry is a central partner in the review of prices and expansion of the local generation capacity of electricity and petroleum storage in Eswatini. The Ministry is in particular overseeing the rural development and is also a key partner in planning and overseeing provision of energy supplies also in rural areas.

Swaziland Environment Authority (SEA): was established in 1992 to address environmental issues within the country. SEA is also responsible for the issuing of Environmental Compliance Certificates for any project, small and large. The Environmental Management Bill of 2001 was developed to provide for and promote the environmental protection and conservation of the environment and, where appropriate, the sustainable management of natural resources.

64 Membership is voluntary

Ministry of Tourism and Environmental Affairs: The mandate of the ministry is to promote and support the tourism industry and wildlife conservation within an environmental framework that enhances amenities, conserves culture, sustains forest management, embraces meteorology and addresses climate change challenges to contribute towards sustainable socio-economic development.

Ministry of Commerce Industry and Trade: The ministry's mission is to provide an enabling environment and support for the development and growth of business and industry for the attainment of economic development.

7.1.6 RESEARCH AND EDUCATIONAL INSTITUTIONS

Eswatini's research and higher education in the fields of energy is still at infancy. As of November 2017 there is one established research entity under the University of Swaziland. Eswatini has no specialist fields of study such as electrical engineering with specialty in energy efficiency, building energy efficiency or industrial energy efficiency course. There are no specialist fields for solar or other renewable energy developments or a master's degree course in rural energy or energy pricing, just to mention a few examples. Young students must either study in South Africa, Namibia or other neighbouring countries if they want to further their career in the energy and development space. While we recognize the advances of supplementing the local skills base with regional and international experiences, many scholars do not return to Eswatini after having completed their studies abroad. Such knowledge drain is not limited to the energy sector, but through attractive and intelligent planning and promotion, we seek to attain and retain skilled resources.

With the guidance from NEP 2018 the MNRE will:

- Prioritize selected technical subjects within the energy curriculum, for example petroleum blending, rural solar PV, hydro power and other subjects where Eswatini either has or could develop a competitive advantage. Eswatini could also prioritize skills development at the artisan level as this might better match our work force and skills level of job seekers. Subsequently, we will help establish a dynamic and attractive research and skills development environment, thus ensuring that Eswatini over time becomes a learning hub for a few selected technical and energy subjects.

7.1.7 KEY ASSOCIATIONS AND PARTNERS

The Federation of Swaziland Employers and Chamber of Commerce is an employer and business organisation representing employers in all sectors of the Eswatini economy.
The Federation consists of 18 sectors, each of which elects one member for the Board. Energy is not a sector but a committee with support from external donors to build capacity. The main issues and focus areas for the energy committee include:

- Tariff increases and cross subsidies,
- Need for a clear policy direction on power generation,
- Need for clear direction on RE's inclusion into the grid and future role in Eswatini,
- Additional barrier for RE is the VAT charged on RE product imports while the sale of electricity is exempt.

Eswatini has a renewable energy association (REASWA). REASWA is a registered, non-profit making NGO whose mission is to promote sustainable energy through energy efficiency and the cost-effective use of renewable energy, in an environmentally sustainable and socially acceptable manner. REASWA consists of a cross-section of stakeholders from government, the private sector, non-governmental organizations and tertiary institutions. The complexity of stakeholders influences the role REASWA can play.

7.1.8 USER GROUPS / CONSUMER ASSOCIATIONS

Eswatini's civil society is not specifically oriented towards energy. NGO activities are coordinated through the Ministry of Home Affairs. NGOs work primarily in the health, education, environmental and social services sectors. NGOs can become members of the umbrella organisation for NGOs in Eswatini, the Coordinating Assembly for NGOs (CANGO).

➢ NEP 2018 will guide the transformation of the modus operandi within the energy sector so all Partners and Stakeholders are empowered to play their roles and collectively contribute to achievements of the National Energy Goals.

7.2 COMMUNICATION

The MNRE and the DoE will ensure that all matters of public relevance are announced and communicated in line with the Law of Eswatini. This includes regular update of the Ministry's web-portal highlighting news, policy information and regulations.

7 3 AWARENESS AND INFORMATION

Awareness about energy optimization and different forms of energy is a subject that needs attention. While large parts of Eswatini's households and some industries are energy poor, our country as a whole is not particularly energy efficient. We also do not optimize the use of all our available renewable resources. Much of this has to do with awareness, information and skills.

The MNRE and the DoE will prepare detailed awareness targets and through systematic awareness actions we will strive to raise the awareness about energy. This includes and is not limited to awareness actions such as:

- Radio talk shows targeting electrified and not-electrified households as well as industrial radio shows discussing subjects such as energy efficiency, co-generation and other energy matters.
- Road shows and energy fairs.
- Posters.
- Internet based information material and awareness programmes.

We wish to see Eswatini as a nation with full access to modern energy. This goal can only be achieved if the decision makers at all levels in our society are able to make informed decisions; if we are able to prepare, procure and produce appropriate energy technologies and if we are able to generate the energy needed.

7.4

1.1 FUTURE SECTOR COORDINATION AND NETWORKING

A common view among all stakeholders is that increased clarity, policy directions and communication will help to break the bottlenecks. A regular subject - specific stakeholder dialogue and problem-solving forum may unlock additional resources and generate better synergies which collectively can lead to increased activities in the energy sector. Through involvement of business associations and skilled labour, the implementation of policies can improve. Any idea from improved construction of energy efficient houses to rural delivery models for sustainable energy is more likely to be implemented when Government takes full advantage of the available resources. Table 3 below shows various roles and responsibilities in the energy sector.

TABLE 3 Roles and Responsibilities in the Energy Sector

1: Lead 2: Participate 3: Informed

	Policy	Legislate	Regulate	Sale of energy (incl. IPP)	Monitor	Research	Information	Education
MNRE	1	1	3	3	1	3	2	3
SERA	3	2	1	3	3		2	
SEC	2	3	3	1	2	2	1	3
Min Economic	2	2	3	3	3			
Min Finance	2	3	3					
Min Environment	2	3	1					
Petroleum Whole sale	2	2	3	1	2	2	1	
Petroleum Retail	2	3	3	1	2	3	1	
IPP	2	2	3	1	2	2	2	
Business	2	2	3	2	3			
Schools	3	3	3			2	1	1
Universities	3	3	3		3	1	1	1
User groups	3	3	3				3	3

The NEP 2018 will monitor and ensure that appropriate sector specific action and coordination groups are established. These groups will work with clear mandates and they will assist the Government to help accelerate implementation.

The experience of implementing the NEP 2003 has been that despite many institutions being in existence there have not been an effective utilization of the collective capacities due to reasons such as a lack of leadership, a lack of resources, failure to implement actions due to insufficient communication and networking, and unavailability of skills in the country. In order to move forward, the NEP 2018 will promote the systematic capacity assessment with a view to establishing comprehensive capacity building programmes for every energy sector.

Position 22: Ensure appropriate institutional capacity is in place to manage and develop Eswatini's Energy Sector to the benefit of all.

This position will be achieved through immediate initiation of systematic capacity assessments throughout both the electricity and the petroleum sectors. The assessments will identify leadership, resources, skills, structures and systems as well as networking shortfalls and design the business plans and capacity building plans accordingly.

8. MONITORING AND EVALUATION

The Government of Eswatini will establish a robust monitoring and evaluation (M&E) system in order to monitor the implementation of the revised NEP 2018 and the aligned NEPIS. The Department of Energy (DoE) will be responsible for monitoring and evaluation of the NEP 2018 implementation, in consultation with other relevant Government departments, the private sector and civil society. The M&E system will assist the MNRE and the DoE to monitor the progress of the implementation of the NEP and identify any issues in the implementation of the policy. Given that Eswatini is a signatory of UN SE4ALL targets and goals, the NEP monitoring will be aligned with the multitier Global Tracking Framework (GTF). The M&E system will be consistent with Eswatini's global obligations under other UN and international commitments.

Information about the final energy consumption is collected to be presented in three groups only, namely transport, industry and other (which include the residential sector, agriculture, and the commercial and public building sector including the hospitality sector). The industry sector excludes the sugar industry. Key indicators including sources and means of verification of the indicators need to be identified. A monitoring system consisting of at least the following will be developed.

- Institutional framework to support monitoring and evaluation processes,
- Specific set of indicators and milestones to track the achievement of the policy goals,
- Baseline on energy goals so that the indicators can be used to monitor progress from the baseline,
- Procedures for data collection to ensure data quality,
- Annual update of energy data and statistics including energy balance.

Annual monitoring reports will be produced by the DoE on the progress of implementation of the NEP 2018.

The evaluation will be carried out using the information obtained through monitoring of indicators and supplemented with analytical investigations and stakeholder consultations. The frequency of evaluation will depend on structural changes in the energy sector or economic sectors that depend on the energy sector. The MNRE will ensure that there will be an evaluation typically every five years. The evaluation will ensure a broad and representative perspective on the achievements and challenges during the implementation of the NEP and provide recommendations for adjustments at the overall NEP 2018 level. Adjustments of implementation at the detailed level will be evaluated on an annual basis and updated as part of the annual work planning.

The Government of Eswatini is committed to ensuring a sustainable generation, supply and distribution of energy services for all. The commitment will, as described in this policy, be delivered through a number of implementation strategies, primarily as articulated in the National Energy Policy Implementation Strategy (NEPIS) 2018. The NEPIS 2018 will be monitored by the MNRE and implementation will be guided by detailed strategies and action plans.

Specific and detailed strategies are formulated for the energy sub-sectors of Petroleum, Bio-fuels, Independent Electrical Power Production and Energy Efficiency. Other strategies and action plans may be launched if deemed necessary to push for greater success in the implementation.

The value of this NEP 2018 is determined in the future by means of measuring the results. Holding ownership of this NEP 2018, the MNRE will in collaboration with all stakeholders and partners work towards facilitating the successful achievements of the aspirations of NEP 2018.

Position 23: Government will establish and ensure systematic monitoring of NEP 2018.

9. IMPLEMENTATION

The implementation of this policy is attached in the separate National Energy Policy Implementation Strategy (NEPIS). The NEPIS also includes an overall draft budget.

ANNEX 1 - KEY DOCUMENTS

Compendium of Environmental Laws of Swaziland, SEA, 2005

Development Strategy for Swaziland Promoting Sustainable Development and Inclusive Growth, October 2014

Framework for National Development Strategy Review, January 2013

His Majesty's Government Programme of Action 2013-2018

Independent Power Producer Policy – Government of the Kingdom of Swaziland, Draft 2015

Kingdom of Swaziland "Country Strategy Paper 2014-2018" draft AFDB

National Development Strategy - Government of the Kingdom of Swaziland, 1997

National Energy Policy – Government of the Kingdom of Swaziland, Sep. 2003

National Energy Policy Implementation Strategy Project – Revised Institutional Framework, July 2009

Population Census Swaziland 2007

SADC Energy Monitor 2016 – Baseline study on the SADC Energy Sector

SE4ALL Country Action Plan, May 2014

SE4ALL Investment Prospectus, June 2016

SE4ALL Action Agenda, July 2016

Staff Audit and Business Plan MNRE, September 2005

Swaziland Electricity Company Annual Report 2014/15

SEC current status of energy sector and future plans, 2012

Swaziland Households Energy Access (Survey Report), 2014

Swaziland's Third National Communication to the United Nations Framework Convention on Climate Change. April 2016

Technical assistance support to the Government of Swaziland in sustainable land administration and management. Inception report December 2016

"The Post-quotas EU sugar sector" Research for agri committee – EU Directorate-General for Internal Policies. July 2016

Swaziland Renewables Readiness Assessment, IRENA, 2014

SWAZILAND: A Framework for National Development Strategy (NDS) Review, MEPD, January 2013

The Electricity Act, 2007

The Swaziland Electricity Company Act, 2007

The Energy Regulatory Act, 2007

The Petroleum Bill – Government of the Kingdom of Swaziland, Draft 2016

The Swaziland Poverty Reduction Strategy and Action Plan (PRSAP), MEPD, 2007

World Food Programme "Swaziland country profile" 2016

Draft Energy Master Plan

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