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MINISTRY OF INFRASTRUCTURE

RWANDA ENERGY POLICY

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|-----------|--|
| BEST | Biomass Energy Strategy |
| BTC | Belgian Technical Cooperation |
| CDM | Clean Development Mechanism |
| CFL | Compact Fluorescent Lamp |
| DRC | Democratic Republic of Congo |
| DSM | Demand-Side Management |
| EAC | East African Community |
| EDCL | Electricity Development Company Limited |
| EDPRS | Economic Development and Poverty Reduction Strategy |
| REP | Rwanda Energy Policy |
| ESSP | Energy Sector Strategic Plan |
| EUCL | Electricity Utility Company Limited |
| EWSA | Energy Water and Sanitation Authority Ltd. |
| FONERWA | Rwanda National Climate Fund |
| GDP | Gross Domestic Product |
| GHG | Green House Gases |
| GoR | Government of Rwanda |
| GiZ | German Technical Cooperation Agency |
| HFO | Heavy Fuel Oil |
| IPP | Independent Power Producer |
| JADF | Joint Action Development Forums |
| KWh | Kilowatt-hour (Unit of energy) |
| LPG | Liquefied Petroleum Gas |
| MIGA | Multilateral Investment Guarantee Association |
| MIGEPROF | Ministry of Gender and Family Promotion |
| MINAGRI | Ministry of Agriculture and Animal Resources |
| MINALOC | Ministry of Local Government |
| MINECOFIN | Ministry of Finance and Economic Planning |
| MINEDUC | Ministry of Education |
| MINICOM | Ministry of Trade and Industry |
| MININFRA | Ministry of Infrastructure |
| MINIRENA | Ministry of Natural Resources |
| MoU | Memorandum of Understanding |
| MT | Metric tones |
| MTEF | Medium Term Expenditure Framework |
| NAMA | Nationally Appropriate Mitigation Action |
| NCST | National Commission of Science and Technology |
| NDBP | National Domestic Biogas Programme |
| NICA | National Standards Inspectorate, Competition and Consumer Protection Authority |
| NIRDA | National Industrial Research and Development Agency |

| | |
|-------------|---|
| PMO | Prime Minister's Office |
| PPA | Power Purchase Agreement |
| PPP | Public-Private Partnership |
| PSF | Private Sector Federation |
| PV | Photovoltaic |
| RSB | Rwanda Standards Board |
| RDB | Rwanda Development Board |
| RECO | Rwanda Electricity Corporation |
| REG Ltd | Rwanda Energy Group Limited |
| REFIT | Renewable Feed-in Tariff |
| REMA | Rwanda Environment Management Authority |
| RET | Renewable Energy Technology |
| RURA | Rwanda Utilities Regulatory Authority |
| RWASCO | Rwanda Water and Sanitation Corporation |
| RT&D | Research Technology & Development |
| SACCOs | Savings and Credit Cooperatives |
| SEZs | Special Economic Zones |
| SPDs | Small-Scale Power Distributors |
| SWAp /eSWAp | Sector Wide Approach / Energy Sector Wide Approach |
| SWG | Sector Working Group |
| TVETs | Technical and Vocational Education Training Centers |
| UNECA | United Nations Economic Commission for Africa |
| UNEP | United Nations Environment Program |
| UNFCCC | United Nations Framework Convention on Climate Change |
| VAT | Value Added Tax |

FOREWORD

Energy is pivotal to most of the challenges and opportunities the world faces today. Whether one speaks of maintaining national stability, economic growth, protecting ecosystems or promoting social equity, they all hinge at least to some degree on access to secure and sustainable energy. In Rwanda, energy is a critical productive sector that can catalyze broader economic growth and contribute significantly to facilitating the achievement of the country's socio-economic transformation agenda.

This Energy Policy has been elaborated to guide and influence decisions on the extraction, development and use of Rwanda's energy resources in a transparent and sustainable manner. The policy framework outlined herein comprises a set of governing laws and regulations, strategic directions and guiding principles that Rwandan institutions and partners shall adopt and adhere to, in subsequent implementation of actions. The vision of the energy sector is to become one of Rwanda's most dynamic sectors and investment destinations. In addressing both demand and supply side issues across all key sub-sectors, this policy will contribute to realizing that vision. The energy policy is founded upon three essential government principles:

- i. A resolve for transparent and effective sector governance
- ii. Easing doing business and reducing barriers to private investment
- iii. Enhancing institutional, organizational, and human capacities as well as the legal and regulatory framework.

The Energy Policy and the Energy Sector Strategic Plan (ESSP) are mutually reinforcing. Whereas the policy outlines a long-term vision, provides high-level goals, and recommends clear and coordinated approaches for achieving that vision, the ESSP outlines targets and an implementation framework against which to measure progress towards the realization of the policy. In this way, the policy can guide the actualization of aligned implementation strategies, while the ESSP outlines the priority strategies and actions that give practical thrust to the policy.

The Ministry of Infrastructure is grateful to all stakeholders who provided very useful inputs into enriching this Policy document and the Technical Team both at the Ministry of Infrastructure and other sister Ministries, who worked really hard to complete the development of this document.

EXECUTIVE SUMMARY

Energy is the life-blood of development. The energy sector plays a pivotal role in supporting socio-economic transformation and has an inherently systemic link to the growth of other sectors of the economy. Since energy is a critical input to other key economic sectors, such as manufacturing, construction, mining and quarrying, agro-processing, transport, and tourism, a sound and comprehensive Rwanda energy policy is critical for economic growth.¹ Investments in the energy sector generate fiscal revenues through taxes, levies, and other duties imposed on various sector activities such as petroleum products imports (fuel oils and LPG) as well as tariffs on electrical consumption (18% VAT), supporting the country's resource envelope. In order to achieve sustainable economic growth, an enabling environment and policy framework is needed to facilitate new energy investments that meet the needs of Rwandan consumers.

Ensuring access to modern, sustainable, and affordable energy services is integral to Rwanda's economic development, poverty eradication and socioeconomic transformation agenda.² Lack of modern energy services stifles income-generating activities and hampers the provision of basic services such as health care and education. In addition, smoke from polluting and inefficient cooking, lighting, and heating devices is a leading contributor to respiratory diseases and death in Rwanda.³ Where provision of cost effective, appropriate solutions to the poor is enabled, particularly in rural areas where energy services are scarce or expensive, poverty reduction can occur. Additionally, shifting consumption from biomass-based energies to clean energies like electricity and LPG reduces pressure on forest resources, protecting land arability and mitigating climate change through sustainable environmental conservation.

Increased, broadly shared prosperity also hinges upon developing the energy sector as key pillar or engine of economic growth. In the household sector, energy services for cooking, lighting, heating, brewing, firing, boiling, ironing, and operating electric appliances are important to maintaining human security, good health and quality of life. A modern, more service-industry based, industrialized economy requires predictable, sufficiently available, competitively priced energy commodities (e.g., electricity and petroleum products). This drives agricultural mechanization, increasing returns per hectare and people's disposable

¹According to the Ministry of Trade and Industry, Rwanda's 2013 industrial production expanded by 11% compared to 4.6% for the economy as a whole. This growth was primarily driven by the construction sector and mining activities.

²According to the UN Foundation almost 3 billion people rely on traditional biomass for cooking and heating, and about 1.5 billion have no access to electricity, with 1 billion more having access only to unreliable electricity networks.

³Smoke from polluting and inefficient cooking, lighting, and heating devices kills over four million people globally a year. Global Burden of Disease Issue, *The Lancet*, December 2012.

income. Petroleum products drive the transport sector and petroleum price movements impact on macroeconomic balances. Distributed energy solutions support business creation, productivity, and entrepreneurship in rural areas, widening the tax base and supporting the socioeconomic transformation agenda. The manner in which energy investments and access programs are designed can also strongly support government policies on boosting youth productivity and employment.⁴

In order for the energy sector to leverage a most positive impact on the other sectors in a way that supports Rwanda's development and socioeconomic transformation agenda, the Rwanda Energy Policy has been elaborated. This policy is well aligned to the country's overall long-term economic policies and calls upon various institutions to undertake measures that support private sector growth and socio-economic transformation as reflected in the Medium Term Economic Development and Poverty Reduction Strategy for 2013-2018 (EDPRS-II). This policy offers high level guidance on the development of Rwanda's energy sector in a manner that fulfills the sector commitments. The energy sector and industry is complex, encompassing multiple subsectors, including electricity, biomass and petroleum. The wide-ranging objectives and planning frameworks contained herein cut across all sub-sectors of the energy, and likewise address issues related to upstream exploration, production, transportation, pricing, distribution and consumption.

While the ESSP and Rwanda Energy Policy are mutually reinforcing, the latter provides high-level direction on the longer-term goals, priorities, and approaches needed in the sector. In this way, the energy policy directives support the development of harmonized implementation strategies and action plans that are clear, well-coordinated, and aligned to EDPRS-II. Closely linked to the policy, the laws and regulations of the sector act as a solid foundation upon which to base actions; these are principally concerned with the conduct, rights and operational constraints affecting the market-place and policy delivery.

The ESSP is a more focused action plan that measures short-term progress toward long-term goals and objectives. It also takes into account anticipated resource constraints and risk/uncertainties in the implementation strategies. The ESSP shall be updated at minimum on an annual basis. Falling underneath the ESSP, and in parallel to the ongoing least cost power development plan, sub-sector implementation Action Plans owned by the relevant ministries (and generally not subject to Cabinet approval) shall be elaborated. These shall be developed for seven priority areas in the electricity sub-sector, including: hydropower, methane gas, geothermal, bioenergy, solar power, peat and efficiency and demand-side management. The action plans shall be aligned to the overall policy objectives.

⁴These are key thematic areas of EDPRS II which targets the creation of 200,000 off-farm jobs per annum.

CHAPTER ONE: POLICY CONTEXT

1.1. COUNTRY OVERVIEW

Rwanda is a small land-locked country of 26,338 km² in area with a population of 11,689,696 people (*national census, 2012*). It is a densely populated country in comparison to other African countries. In 2014, GDP was 643 USD/capita. Rwanda's economy has been growing at an annual average rate of 8.3% and government is targeting to achieve an annual average growth rate of 11.5% over the EDPRS II period (2013-2018). Ensuring access to affordable and modern sources of energy is essential to achieve the EDPRS II objectives.

1.2. NEED FOR AN ENERGY POLICY FRAMEWORK AND SECTOR CHALLENGES

There are several reasons why a Rwanda National Energy policy is required. Firstly, the lack of a modern, long-term approved energy policy is widely recognized by stakeholders as contributing to coordination failures and institutional underperformance. The current document reflects a revision to a national policy that was drafted in 2011. Although used as a guiding framework, this policy was never formally approved by Cabinet. Prior energy policies include a 2004 Energy Policy that largely responded to emergency energy security considerations, rather than addressing a broad range of issues, as well as a proposed policy elaborated in 2008, following EDPRS I, that was rejected by the Cabinet.

Secondly, a general policy shift is required due to underlying changes in the country. The economy has experienced stable growth for some time, and power supply crises have stabilized. Rwanda's population is growing quickly and is projected to reach 14 million by 2020 and 16.4 million people by 2030.⁵ In the household sector, essential energy services for cooking, lighting, heating, brewing, firing, boiling, ironing, and operating electric appliances is thus expected to grow significantly. At the same time, Rwanda currently has low levels of access to modern energy carriers such as electricity and LPG. This marked energy poverty constrains efforts to achieve medium-term thematic and macroeconomic objectives of the EDPRS II, including attaining middle income status by 2020.

The current electricity tariff is relatively high compared to other countries in the region and heavily subsidized.⁶ High relative energy costs and unreliable power supply dis-incentivize stronger industrial growth and business expansion. This particular challenge is perceived as most critical in the manufacturing, mining, and agro-processing sectors. Power cuts, unstable

⁵These represent base-case population growth scenarios according to the Rwandan National Institute of Statistics.

⁶ *Review of Current Electricity End User Tariffs*: Final Report to RURA by Energy & Economics Consulting, 30 April 2014.

power supply conditions, and uneven power quality are additional constraints to industrial sector growth.

Thirdly, EDPRS-II calls for an unprecedented degree of investment in Rwanda's emerging energy systems and markets to come from the private sector. This major shift requires new policies and strategies to leverage private capital and facilitate private sector engagement and partnership. A transparent and stable policy framework will be critical.

The policy needs to address the following critical sector challenges:

- i. Energy security and a sound demand-supply balance;
- ii. Dramatic increase in access to modern energy services;
- iii. Improvement and streamlining of stakeholder coordination to ensure effective partnership and delivery on set targets;
- iv. Need for a robust legal and regulatory framework required;
- v. Necessity for an institutional, organizational, and human capacity development;
- vi. Inadequate infrastructure requiring huge investment;
- vii. High cost of fuel for electricity generation;
- viii. Vulnerability to climate change.

In addition, the development of relevant policies for the energy sector mandates that, the key issues that affect the supply and demand of energy in Rwanda be delineated. Broad issues of the energy sector in Rwanda include the following:

- i. Inadequate co-ordination and information sharing between/or among the various projects, government bodies, the private sector and civil society organizations;
- ii. Lack of investment;
- iii. Inadequate energy planning information system (energy supply and demand analysis);
- iv. Lower rate of access to modern energy;
- v. Inadequate financial resources to plan for and monitor the energy sector and carry out appropriate research and development (R&D);
- vi. Lack for appropriate curricula in energy studies at many institutions of higher learning;
- vii. Inadequate human resource and institutional capacity.

For each of the energy-sub sectors there are specific issues to consider, which are given below. The various energy sub-sectors include the following:

- Electricity;
- Petroleum;
- Biomass;

- Energy Efficiency and Demand Side Management.

1.3.1 Electricity

The electric power sub-sector issues in Rwanda include the following:

- i. Insufficient investment to develop electricity generation, transmission and distribution projects including the interconnection projects that can facilitate and enhance the energy trade;
- ii. Large technical and non-technical electricity losses;
- iii. Inadequate maintenance;
- iv. High costs of supply due to the past insufficient investment in power generation, transmission and distribution and sometimes coupled with a very low operational efficiency and lack of financial planning;
- v. Lack of cost reflective tariffs;
- vi. Lower electricity access;
- vii. Low quality of electricity supply and customer service;
- viii. Inefficient commercial operations in terms of lack of an accurate customer database, inadequate systems and controls for meter reading and high accounts receivable.

1.3.2 Petroleum

The petroleum sub-sector issues include the following:

- i. The evolution of prices, in particular, oil prices on the international market impacts negatively on the balance of payments of oil-importing and renders the cost of energy supply unbearable;
- ii. High transport costs due to insufficient transport facilities and being landlocked;
- iii. Inadequate quality control of the fossil fuels products, posing an increasing hazard to public health and the environment.

1.3.3 Biomass and other Renewable Energy Sources

Issues of Biomass and other renewable energy sources include the following:

- i. Inefficient production and use of wood-fuels resulting in the depletion of forest resources, which, in turn, has an adverse environmental impact in terms of accelerating climate change, threatening biodiversity and increasing erosion. It also has an adverse impact on the health of wood-fuels users, especially in rural households;
- ii. Low public awareness about the efficacy and potency of renewable energy technologies (RETs);

- iii. Little production of equipment and components and underdeveloped markets in RETs equipment and services because of high initial investment cost and lack of financial capacity to cover the initial investment;
- iv. Lack of mechanisms to monitor standards and ensure quality control of RETs: the poor quality of some technologies available on the market reduces their lifetime and damages the image of RETs;
- v. Inadequate financing mechanisms;
- vi. Inadequate data available on the potential of indigenous renewable energy sources (geothermal, solar, wind, peat, methane gas, mini and micro hydro);
- vii. Shortage of local actors capable of carrying projects financially, technically, and in terms of management; and
- viii. Institutional, policy, fiscal and regulatory barriers.

1.3.4 Energy Efficiency and Demand Side Management

Energy efficiency and demand side management issues include those generic issues for the major sectors which include transport, industry, households and agriculture.

Accordingly, energy efficiency and demand side management issues include the following:

- (i) Low level of awareness among energy end users about energy conservation practices, options and benefits and insufficient information about improved energy technologies;
- (ii) Insufficient incentives, including financing mechanisms to invest in modern efficient technologies and practices and to introduce fuel / technology substitution, e.g., LPG, kerosene, solar, more efficient fuel technology, for wood-fuels;
- (iii) Dominance of energy-inefficient technologies, including traditional stoves; lights and other appliances.

These critical sector challenges and sub-sector issues can only be addressed through a clear energy policy framework.

1.3. SECTOR OVERVIEW

The energy sector in Rwanda consists of four components: Electricity, Biomass, Gas and Petroleum, with each playing a key role in Rwanda's transition to a middle income country by the end of the decade.

Although Rwanda has had considerable success over recent years in addressing issues related to environment to the extent that it's one of only a few countries in Africa where there is not a major link between biomass and the negative environmental effects of deforestation, social and health problems emanating from the use of biomass need to be solved. The government

is promoting the use of alternative fuels such as biogas from animal and plant waste. This will not only save lives but also free up the time spent by women and children in collecting firewood, giving them more time to study and undertake more productive commercial activities.

The use of electricity is required for both low consumption devices and large consumers. Our priority is to extend the network to allow productive and heavy users of electricity across the country to connect to the grid. For lighter users of electricity, grid connections are unlikely to make economic sense in the short term and as such, off-grid will be preferred. The government intends to provide 70% of the population with access to electricity both on-grid and off-grid by the end of EDPRS II which is now at 23%.

To keep pace with the increased demand for electricity, the government will ensure increased electricity generation capacity above the current capacity of 160 MW (March 2015). Diversifying away from diesel generation will enable the government to maintain a regionally competitive tariff whilst eradicating subsidies to the electricity tariff. There is considerable private sector interest in electricity generation from Rwanda's indigenous resources.

Petroleum subsector's objective is to ensure safe, sufficient, reliable, sustainable and affordable supply of petroleum and LPG. Currently, Rwanda depends entirely on imported fuel products, because its petroleum resources are yet to be commercially proven and developed. Rwanda plans to expand domestic exploration and production, boosting investment in supply and storage infrastructure, and promoting sound management of downstream resources.

1.3.1. Electricity

Total installed electricity generation capacity is currently 160 MW, of which roughly more than 60% comes from hydrological resources and less than 40% from diesel-powered generators and other sources.⁷ Rwanda has a very pronounced peak demand load and hence supply is occasionally unable to match demand in these peak hours. The current on-grid access to electricity is estimated at 23% of households.

National Electricity Consumption: The cost of electricity is currently not cost reflective and heavily subsidized. The diesel fuel and heavy fuel oil required to run petroleum-based power plants represents a large share of the total national import burden, and is one factor driving the high cost of electricity and currency depreciation. The loss estimate of 2014 in the power system (both technical and non-technical) was 23%.

⁷ EWSA, Grid Audit Report, 2013.

1.3.2. Petroleum

Currently, Rwanda depends entirely on imported fuel products, because its petroleum resources are yet to be commercially proven and developed. Petroleum consumption increased in absolute terms by over 16% between 2000 and 2012, yet the oil import bill grew by more than 700% in the same period. As a share of GDP, oil imports increased from about 2.5% in 2000 to above 5.5% by 2012. Still, this level of growth has been relatively more modest compared to Rwanda's neighbours. The demand for petroleum products will continue to rise on account of increased transport vehicles and expansion of the fleet for the National airline. The reduction of imported diesel for electricity production will be more than off-set by the increased need for petroleum products in transportation, particularly aviation and heavy industry.

1.3.3. Biomass

In Rwanda, biomass energy subsector covers mainly wood, charcoal, biogas and biofuels. Biomass resources are exploited in form of firewood, charcoal or agricultural residues mainly for cooking purposes by households and also in some industries⁸. Country-wide, biomass meets up to 85% of energy needs; with the balance being met by other options such as kerosene, diesel, dry cells, grid and non-grid electricity, biogas, solar, wind and other renewable energies. Biomass is already in short supply with the country facing a biomass deficit of over 4 million m³ per year⁹. Although fuel wood consumption is expected to increase in the short-term, the long-term strategy of the EDPRS II is to reduce fuel wood consumption from 85% to 50% by 2018.

Rwandan households will not eliminate the use of wood fuels in the short run. Instead, as the economy develops wood fuels will be phased out where it makes sense. This will be supported with the introduction of enabling frameworks for use of LPG and other alternatives including solar and thermal applications, particularly in urban and semi-urban areas.

⁸ MININFRA, 2008

⁹ BEST Strategy, 2009

CHAPTER TWO: ENERGY POLICY VISION, MISSION, GOALS, KEY PRINCIPLES AND OBJECTIVES

2.1 VISION

The vision of the energy sector is to contribute effectively to the growth of the national economy and thereby improve the standard of living for the entire nation in a sustainable and environmentally sound manner.

2.2 MISSION

The mission of the Rwanda energy sector is to create conditions for the provision of sufficient, safe, reliable, efficient, cost-effective and environmentally appropriate energy services to households and to all economic sectors on a sustainable basis.

2.3 OVERARCHING POLICY GOALS

The overall goal of the policy is to ensure that all residents and industries can access energy products and services that are sufficient, reliable, affordable, and sustainable.¹⁰ Specific core global objectives of the energy policy include:

- Ensuring the availability of sufficient, reliable and affordable energy supplies for all Rwandans;
- Creating an enabling environment for increased private sector participation in energy supply and service provision;
- Encouraging and incentivizing more rational, efficient use of energy in public institutions, and amongst industrial and household end-users;
- Ensuring the sustainability of energy exploration, extraction, supply, and consumption so as to prevent damage to the environment and habitats;
- Promoting safe, efficient, and competitive production, procurement, transportation, and distribution of energy;
- Developing the requisite institutional, organizational, and human capacity to increase accountability, transparency, national ownership and decentralized implementation capacity for sustainable energy service delivery.

Collaborating with the private sector, the Government will also work towards meeting national, regional, and global targets to enhance access to modern energy services. Rwanda is a signatory to the United Nations Sustainable Energy for All Initiative (SE4ALL), and is in the

¹⁰Sustainable energy use is the practice of providing energy solutions in a manner that meets the needs of the present without compromising the ability of future generations to meet their needs (Renewable Energy and Efficiency Partnership, August 2004). Not all energy resources are renewable in human lifetimes. For this reason, wasteful or inefficient use of resources could well lead to reduced security and affordability for future generations of Rwandans.

process of preparing a detailed road map, Action Agenda, and investment prospectus. Rwanda is also a signatory to the Regional Strategy on Scaling up Access to Modern Energy Services adopted by the EAC Council of Ministers. In order to increase access, electricity and clean fuels must be available and affordable. For this reason, policies herein aim to create a sound enabling environment for;

- off-grid energy service provision including the development of distributed, small-scale renewable energy solutions and business models; and
- Lean fuels energy service provision, including the development of infrastructure and distribution for LPG and biogas.

2.4 KEY POLICY PRINCIPLES AND PRIORITIES

The following principles summarize Government's guiding approach to energy development. They reflect a need to balance and protect the interest of citizens and energy consumers, private investors, and other stakeholders. They give high-level policy prescriptions on how Rwanda's energy resources should best be exploited, distributed, and utilized. These foundational principles promote an enabling environment for successful achievement of commitments reflected in the ESSP and future sub-sector action plans in the development of specific policy directives and guidelines.

1) Building decentralized energy policy implementation capacity

A strong principle underlying the development and implementation of the energy policy is the need to ensure strong national ownership over decision-making and to undertake measures to empower local companies and Rwandan experts in fulfilling the vision of the sector. This entails having a much stronger focus on building domestic human, organizational, and institutional capacity. Local authorities are encouraged to include and monitor obligations for providing improved energy services and access to clean energy technologies. Moreover, energy issues should be regularly addressed in relevant integrated development Steering Committees and Joint Action Development Forums (JADF).

2) Promote value-for-money and increased market competition in energy development

Government shall establish transparent processes and guidelines for all energy project procurement. Given the increased role of the private sector in the delivery of energy projects and services, it is important to ensure that more competitive and transparent practices are put into place.

Under the policy, competitive bidding of all energy-related projects, including independent power production (IPP) generation activities, shall henceforth be the *default* procurement option. This is vital to realize more market transparency and to ensure value-for-money in the

use of public funds.¹¹ Provided a project still conforms to value-for-money principles, exceptions may be warranted in cases of:

- i. *Urgent need.* Ensuring continuity of supply or providing services rapidly due to emergency situations;
- ii. *Public security.* Where the project may directly pose a risk to public security or involves matters pertaining to state security;
- iii. *Technological uniqueness.* For example, when provision of the service necessitates technology for which unique intellectual property, trade secrets, or other exclusive rights are owned or possessed by a single firm or entity;
- iv. Other compelling reasons in the national or public interest.

Projects in these categories may be procured through unsolicited proposals through the signing of a MoU between a private party and the contracting authority.

3) “Smart” subsidies aligned to social protection principles.

In line with existing principles under EDPRS-II for improving the effectiveness of social protection interventions, a gradual shift away from indiscriminate subsidies toward “smart subsidies” shall be pursued for all energy related interventions. The latter term refers to direct mechanisms that targets specific groups including the poorest, most vulnerable end-users. Targeted “smart” energy subsidies and welfare support measures to ensure affordability of energy services should be primarily targeted to vulnerable groups within the limits of the state’s capacity.

4) Private operation of government owned power plants

In order to increase efficiency and create market opportunities for local business, where it is deemed appropriate, government owned power plants shall be considered for lease to the private sector for operation and management. Private operation of such projects tends to always deliver advantages in terms of value for money and more reliable power supply.

5) Promoting private sector participation

Meeting the goals under EDPRS II entails both significant absolute levels of investment in the sector and a much greater relative share projects being privately financed than ever before. Government shall encourage and facilitate private sector participation in the development of Rwanda’s energy resources and in all phases of energy project delivery, including development, construction, financing, installation, maintenance and operations. Increased participation by the local and foreign private sector is particularly encouraged in the electricity supply and clean cooking fuels industry. Government shall pursue a variety of actions to

¹¹It should be noted in this context that the application of a REFIT tariff for power procurement through IPPs would comply with this principle, as there would be little room for negotiation of the set and transparent terms and conditions.

enable marked growth in private sector as outlined in detail below.

i. Streamline investment promotion processes for IPPs.

IPP processes shall be streamlined by clarifying the exact steps, prerequisites, and outcome milestones for each major stage of the investment process, (i.e., obtaining an energy project concession). Resources shall be mobilized for establishing integrated IT systems for tracking project development progress across key energy sector players.

ii. De-risk investments through upstream resource assessments and pre-feasibility studies

Commercial investment in Rwandan energy projects is constrained by high up-front risk before energy resources are confirmed. Government will thus increase investments in better energy resource assessments and resource mapping to de-risk transactions and investments in the sector. Unless already taken into account under mechanisms, such as the feed-in tariff for specific renewable energy resources, Government may also invest in pre-feasibility or “proof of concept” studies as well as feasibility studies and demonstration projects for technologies not yet commercially “proven” or bankable.

iii. Accelerate and facilitate energy sector Public-Private Partnerships (PPPs)

PPP structures are particularly relevant for the energy sector, especially for complex activities where risks are high and innovation can be harnessed from private sector actors. Areas particularly suitable for PPP structures include: rural energy service provision such as off-grid and mini-grid systems.

iv. Empower local enterprises to engage in energy sector

Government shall strive to create more favorable conditions for local enterprises to do energy business in Rwanda including ensuring transparency and equity. For example, the legal and regulatory framework for developing off-grid solutions will be streamlined to attract more local private investors and operators. While provisions to ensure that local content is a feature of new energy investments is already incorporated into concession agreements, new policy measures include standardizing “local content” guidelines suitable for different categories of projects, incorporating clear language on requirements into PPAs, and systematically monitoring compliance for local content participation.

Rwanda’s energy sector can be viewed as encompassing: electricity, energy efficiency and demand-side management, electricity access, biomass, and petroleum. For each of these, the

following policy objectives define how it shall be sustainably developed in a manner that can achieve the overall energy sector goals and objectives. The policy objectives have also been elaborated to be consistent with the overall key principles of the energy policy.

2.5 ELECTRICITY

The main policy objective for the electricity sub-sector is to ensure sufficient, reliable, sustainable and more affordable power supply. This will be achieved through the following measures:

- i. Revise and upgrade the existing policy, legal, regulatory, institutional, and financial frameworks to support the rapid development of the electricity industry;
- ii. Diversify power generation resources over time and increase the share of clean power in the total mix over time;
- iii. Ensure supply is closely aligned to projected demand¹², and better align investment planning and funding mobilization more closely to a power generation road map and master plan, a least-cost power development plan, and an electricity sub-sector action plan;
- iv. Enhance regional cooperation and trade in electricity, including investment in transmission network development, to further improve security of supply;
- v. Streamline IPP processes and fast track project delivery by securing long-term funding for planned projects through a medium-term budget expenditure framework, revising and expanding the existing Renewable Energy Feed-In Tariff regime, developing new information management systems to streamline procedures, and building greater capacity in planning, procurement, and negotiating power transactions.

Additional, related policy objectives are outlined below.

Ensure cost-reflective electricity tariff

The policy aims to achieve a sustainable transition to a cost-reflective, yet affordable electricity tariff. Addressing this challenge shall be met through a four-pronged approach:

- i. Disaggregating tariffs by end-user categories in order to ensure that they fairly reflect the relative contributions to the cost base;
- ii. Increasing operational efficiencies and savings on the required revenues of the utility;
- iii. Reducing the long-run marginal cost of power generation through increased imports and exploitation of alternative technologies; and
- iv. Implementing loss reduction and demand-side management programs to shave peak demand load and grid reserve margin requirements.

¹²Peak demand is expected to exceed 400 MW by 2018 according to the latest estimations.

Strengthen national electric power system

In order to improve the quality and security of electricity supply and to drive down long-term costs, the GoR shall:

- i. Increase investments in generation capacity, transmission and distribution systems and rehabilitation;
- ii. Reduce technical and commercial losses in the power system;
- iii. Increase reserve margin between demand and supply to a necessary level;
- iv. Develop transmission lines connecting Rwanda to neighboring countries.

Optimize the power mix

The policy aims to:

- i. Increase the share of renewable energy in the power mix by exploiting indigenous resources (i.e. hydropower, geothermal, solar, and methane gas);
- ii. Refocus petroleum-based power generation to serve peak load and back-up power demands;
- iii. Manage the share between domestic production and imports in the total mix;
- iv. Revise and update periodically power generation road map and investment plan guided by a Least Cost Power Development Plan (LCPDP).

Enhance attractiveness of exploiting domestic energy resources for power generation.

Government will increase the attractiveness of domestic power generation to the private sector by:

- i. Initiating public-funded exploration and risk mitigation mechanisms;
- ii. Funding energy resource mapping, pre-feasibility studies, upstream exploration, and piloting of projects to gain a clearer picture of the extent to which domestic hydropower, peat, solar and wind resources can generate power on commercially viable, competitive terms;

Facilitate autonomous power generation

While autonomous generation investments are explicitly allowed for under the law, uptake has nevertheless been slow. The establishment of private or self-generation power plants for industrial or household purposes is explicitly allowed for under the Electricity law, with generation under 50 kW installed capacity currently exempted from all licensing requirements. Policy guidelines and regulations to more explicitly facilitate autonomous generation shall be adopted, particularly those geared toward mining and agro-industries.

For example, the current Mining Sector Strategy intends to pilot “green” energy solutions based on solar PV, micro-hydro, and bio-energy resources that could be developed by mining companies as self-generation investments. In order to further streamline and encourage such

activities, measures to simplify licensing regulations for mini-grids or small-scale power distributors (SPDs) shall also be extended to appropriate autonomous generation activities. Guidelines and new regulations concerning autonomous generation shall, however, continue to ensure the respect for existing laws on right of way and expropriation in the event that any distribution infrastructure falls on public lands.

2.6 ELECTRICITY ACCESS

The main policy objective for the sub-sector is to enhance access to sustainable, modern energy services for all Rwandans. This policy priority is reflected in political commitments and targets that Rwanda has made at the global, regional, and national level. To a large degree, making electricity services more affordable and extending consumer credit for grid connection fees is pivotal to reaching this objective. Policies and a supportive regulatory framework shall also be enacted to expand investment and private sector engagement in off-grid electricity service provision, including through partnerships and innovative business models.

Attaining energy access commitments will not only entail increased political will, but also the development of a robust monitoring and evaluation framework that takes into account a variety of criteria. The policy objectives in the sub-sector focus on:

- i. Greater clarity on, and harmonization of, preferential approaches between grid and off-grid energy access efforts for different target population groups;
- ii. Piloting new approaches and scaling up innovative partnerships to increase energy access through distributed renewable technologies;
- iii. Introducing more flexibility and competition through measures to simplify licensing and increase the attractiveness for private operators to service the off-grid electricity market;
- iv. Ensure 100% access to electricity in all schools, health centers and administrative offices by 2018;
- v. Scale-up innovative partnerships to increase rural access to appropriate off-grid solutions;
- vi. Introduce greater competition and flexibility in off-grid service provision.
- vii. Develop financial support mechanisms for off-grid service provision and consumption.

2.7 ENERGY EFFICIENCY AND DEMAND-SIDE MANAGEMENT

The policy objective of the energy efficiency and demand-side management is to constrain uncontrolled future energy consumption growth and to support realizing Rwanda's Green Economy vision. Given growing demand for electricity at household and industrial levels, and the fact that Rwanda's natural resources are more limited compared to other countries in the region, actions to manage demand for electricity is an important and more prominent thrust of the current policy. An increased focus on energy efficiency¹³, energy conservation, and demand-side management activities is sensible. Fundamentally, it is also cheaper to use energy more intelligently and efficiently than to meet demand by expanding energy production unnecessarily.

Rwanda has a pronounced peak demand load, which is both a key factor for power disruptions, because the existing power reserve margin is low, and a key driver for new generation capacity investment. Measures that encourage efficient end-use technologies, sound and optimally timed energy consumption practices, and other demand-side management activities will play a critical role in shaving peak demand and maintaining the affordability and reliability of energy services.

Energy efficiency will be promoted through a combination of approaches, including:

- i. Incentivizing demand side management through changes in the electricity tariff methodology;
- ii. Mandatory regulations, such as new codes and standards;
- iii. The introduction of economic incentives, such as subsidies for installation of solar water heaters and for industrial end-users to undertake energy efficiency audits;
- iv. Barrier removal programs, for example, examining systemic disincentives or reducing split incentives for energy-efficient technologies in buildings;
- v. Pursuit of bulk procurement strategies, for example, importation of LED and CFL lamps; and
- vi. Other measures to promote alternative sources of energy for cooking, water heating and purification, heating, cooling, and lighting.

Priority measures to be pursued in this area include:

Adopt new laws, regulations and codes that mandate energy efficiency measures

New laws and regulations will be developed to ensure that public institutions, households, and commercial businesses support the energy efficiency objectives. Among these shall include an Energy Efficiency Law as an umbrella framework to upgrade existing technical guidelines. Responsible institutions shall introduce new building codes, reflecting provisions

¹³Improving energy efficiency means using less energy to produce the same desired output.

for introducing of energy-smart and energy-efficient technologies and practices, including passive solar design and rain water tank storage.

Restructure electricity tariff methodology to incentivize efficiency

A free-standing “demand charge” tariff component for all customers served through medium-voltage lines will be initiated. This methodological change provides a stable, continuous incentive for industries to conserve power and to shift consumption away from peak periods.

Establish a demand-side management program within the Utility

A demand-side management (DSM) program or dedicated corporate unit shall be formed to undertake planning and monitoring of all activities designed to modify consumer demand patterns. The program will also implement load management programs that reduce demand spikes and encourage end-users to shift consumption away from peak times. This program shall also implement priority policies for reducing demand load under the direct control of the Utility itself. Other measures to intensify the provision of consumer information, education and technical advice towards the use and conservation of energy shall be implemented and overseen by the DSM program.

Encourage and incentivize energy audits among commercial and industrial end-users

Major users of energy, particularly industries, shall be encouraged and incentivized to carry out regular energy audits. The Rwanda Resource Efficient and Cleaner Production Centre has already supported local industry with the successful implementation of a number of audits that delivered bankable returns linked to savings on energy and other resource inputs. The scope of such audits will include the feasibility of fuel switching from thermal power to off-grid solar PV for agro-industries as well as measures to reduce leaks and inefficiencies associated with petroleum consumption for mechanical and pumping activities in industrial processes. MININFRA shall investigate the feasibility of developing an energy efficiency facility that would provide matching grants to large energy end-users for the purpose of undertaking energy efficiency audits and to provide incentives for investing in the implementation of the audit recommendations. The savings from such investments would be used to recapitalize the facility. In addition, advanced, high-efficiency power generation technologies which could include shifting to cogeneration facilities shall be investigated as part of the audits or whenever new feasibility studies are commissioned by the utility.

Develop a regional standards and labeling scheme for common appliances

Appliance rating or labeling schemes are a very cost-effective policy measure for achieving energy consumption savings. Providing information about the energy performance of an appliance, particularly in comparison against a minimum and maximum benchmark,

incentivizes consumers to purchase more energy efficient products. It is critical that consumers are better informed of the energy performance of appliances that they are considering to purchase. RSB in collaboration with RURA and MININFRA shall establish an ongoing working group to harmonize energy efficient labeling practices and standards for appliances sold and imported in Rwanda and the EAC.

Promote and remove barriers to the implementation of priority efficient lighting initiatives

Lighting is by far the most important use of electrical energy. Energy efficient lighting programs' impact will be enhanced through better program design, marketing plans, and leveraging market-based incentives and private sector participation to maximum advantage. An expansion of efficient lighting for public services, including street lighting in public institutions and administrative buildings, shall be supported through the new strategy and implementation programs.

Devise and implement "green" public procurement guidelines and strategies.

As a large energy consumer, government agencies and other public sector institutions play an important role in implementing national energy efficiency targets. RPPA, REMA, and MININFRA shall collaborate to develop clear energy efficiency criteria and guidelines that can be incorporated into sustainable procurement policies and processes. These shall focus on equipment with a high-energy footprint.

2.8 BIOMASS ENERGY

The main policy objective for the biomass sub-sector is to facilitate fuel-switching from traditional biomass energy carriers toward modern biomass energy technologies and cleaner fuel alternatives in order to achieve a more sustainable wood fuel balance and reduce consumption of non-renewable biomass, and to deliver related social, health, and environmental benefits. In addition to measures to promote switching to more sustainable biomass energy technologies at household level, such as biogas, LPG, and peat briquettes, among others, small-scale, commercially viable biogas projects including gasification of crop residues will be promoted through inclusion under an expanded REFIT regime. Existing biomass resources should be exploited in a manner that promotes greater sustainability of supply, while reducing the negative impacts of harvesting to the environment and Rwandan habitats.

MININFRA will develop strategies and action plans including capacity building and enhancing market transformation.

The implementation of sustainable biomass energy programs focused on cleaner cooking technologies shall be decentralized in order to accelerate delivery and improve impact. MININFRA will continue to provide technical assistance through REG Ltd to the districts.

With support and guidance of MINALOC, district authorities will be required to incorporate delivery of sustainable biomass energy technologies into their annual performance contracts. This will promote more ownership. Districts will play a pivotal role in education and awareness-raising, and the extension of government subsidy mechanisms and micro-finance schemes. MINALOC shall monitor district development plans more closely for meeting clean cooking targets and strategies. RSB shall elaborate updated national ICS standards with the support of REMA, MININFRA, and the private sector and other stakeholders.

Increase access to cleaner cooking technologies

In the medium-term, the policy vision foresees extensive fuel switching among households to modern energy technologies and carriers including biogas, LPG, “green charcoal”, and biomass pyrolysis stoves.

Measures to be adopted in biomass energy strategies include the following:

Social marketing/behavioural change models and partnerships with financial institutions

Since the economic rationale for some households to switch to cleaner cooking technologies is limited by the fact that are able to collect wood fuel and biomass residues at no cost, a much stronger emphasis will be placed on social and behavioural change campaigns in implementation approaches.

Updated technology standards

In cooperation with other stakeholders, technology standard for biogas digesters and installations shall be formulated and adopted building upon existing technical guidance. Through new technology standards and regulations, alternative options to increase consumer choice and affordability shall be promoted.

Subsidy reform

In cooperation with MININFRA, MINECOFIN shall reform the design, targeting and administration of subsidies for biogas and other clean cooking technologies in order to improve the impact and scale-up potential of existing programs.

Develop new policy and regionally-integrated market for sustainable liquid bio-fuels

A new bio-fuels policy shall be developed that harmonizes agricultural and land-use approaches and that takes into account a much stronger regional integration dimension to market development. A preliminary bio-fuel policy drafted by the former Institute of Scientific and Technological Research (IRST) in 2008 to promote bio-diesel exploration, production and use shall be updated and integrated into this policy in line with regional policy approaches.

Increasing the share of bio-fuels in Rwanda's energy mix will increase energy security by reducing dependency on imported petroleum products. Markets particularly suitable for bio-fuels include public and agricultural transport vehicles and agro-processing machinery by replacing petroleum fuels entirely with fuel produced from bio-crops.

2.9 PETROLEUM

Rwanda's petroleum sub-sector covers both upstream (petroleum exploration, development and commercial production) and downstream (transportation- for crude and refined products, refining, storage, distribution and marketing) activities. The sub-sector is characterized by three main challenges: unreliable supplies and uneven product quality, insufficient storage and distribution capacity, and high exposure or vulnerability to global price volatility. In a global perspective, petroleum exploration and development activities have become progressively more capital intensive, technologically complex, and environmentally sensitive. Thus, it is essential that national policies are aligned to international realities and best practice and sophisticated enough to ensure that international companies and investment partners with the right mix of expertise and technological know-how are enticed to operate in Rwanda in a manner that ensures environmental sustainability and mutually beneficial cooperation from the extraction of non-renewable, mineral rents.

The main policy objective for the sub-sector is to ensure safe, sufficient, reliable, sustainable and affordable supply of petroleum and LPG. This entails expanding domestic exploration and production, boosting investments in supply and storage infrastructure, and promoting sound management of downstream resources and markets. Existing policies on upstream development and downstream use have been developed by MINIRENA and MINICOM, respectively. Investments shall be facilitated by: proving Rwanda's national resources using public funds; developing streamlining procedures for resource exploration and joint ventures; increasing the transparency of the legal, regulatory and licensing framework; developing technical standards and environmental management protocols; and opening up the market to greater competition. A Downstream Petroleum Policy was adopted by Cabinet in late 2012. It gives guidance on the transportation (of both crude and refined products), refining, storage, distribution and marketing of petroleum products in Rwanda. In order to address current sub-sector challenges, the Rwanda Energy Policy complements these and reinforces the implementation of existing sub-sector policies through the following objectives:

- i. Accelerate regional cooperation and strategic infrastructure development;
- ii. Ensure adequate storage infrastructure to maintain appropriate strategic reserve levels;
- iii. Enhance the effectiveness of price stabilization mechanisms;
- iv. Improve data collection and enforcement of fuel quality standards;
- v. Improving Liquefied Petroleum Gas (LPG) market and distribution infrastructure.

CHAPTER THREE: POLICY PRINCIPLES ON CROSS CUTTING ISSUES

3.1 CAPACITY BUILDING

Vision 2020 calls for the creation of a Knowledge Based Economy built upon continuous upgrading of skills. Lack of capacity in both an institutional and technical sense is a genuine bottleneck to economic growth and achieving the sector vision under the EP. Building sustainable national capacity throughout the entire energy sector in both the private sector and across the government agencies is thus a critical cross-cutting theme.

Clear strategies and operational guidelines on skills development, transfer, utilization, and retention shall be adopted to better align curricula development in higher learning institutions and TVETs to the sector strategy and workforce gaps.

Based on previous assessments and the results of the stakeholder consultations, priority capacity building needs include strengthening and retaining staff resources and capacity in energy sector to formulate and oversee policies, programs, and projects.

3.2 REGIONAL INTEGRATION

Rwanda energy policy and strategies need to better understand how regional energy integration brings new energy security, challenges as well as opportunities. These issues shall be formulated in subsequent policies and guidelines concerning energy security. For example, regional power trading is expected to materially reduce the average cost of power and the carbon intensity of the grid. On the other hand, supply guarantees and third country guarantees on allocated power shares may, however, need to be put into place in order to achieve energy security in a scenario with dramatically increased power trading. In addition, while grid interconnections can mitigate the risk associated with excess supply in the event of inaccurate demand forecasts, exporting power will only make economic sense if Rwanda's tariff becomes more regionally competitive.

3.3 ENERGY DATA COLLECTION AND STATISTICS

Good data is required for energy policy formulation and integrated energy planning. Although proper data systems are costly, the lack of information and cross-cutting challenges that arise from a lack of data are widely seen as a major capacity constraint in the energy sector. MININFRA shall establish an energy sector information system or depository that can serve as a central mechanism for integrated energy data collection, management and dissemination. This system can be used as a key input to energy sector planning and models that take into account all available energy resources and primary consumption patterns to match investments with future demand.

Through this portal, government shall inform research and investment decisions by giving easy online access to data and information to the public. The portal shall include all available resource assessments and upstream feasibility studies that have been undertaken to date.

3.4 ENERGY STANDARDS

Stronger public awareness-raising to inform target audiences of existing technology standards and ensuring adequate enforcement of existing laws and regulations in a cost-effective manner is absolutely fundamental to creating an enabling environment for cleaner energy technologies and development pathways.

3.5 RESEARCH, DEVELOPMENT & TECHNOLOGICAL INNOVATION

In Rwanda, investments in energy-related research and development have been at very low levels, both by the private and public sector. As most energy technology is imported (e.g., up to 80% of all power related equipment, such as turbines for hydro projects) average total investment costs remain high. Investments in developing scientific and technological infrastructure, manpower build long-term capacity and ownership, and contribute to socio-economic transformation by reducing the cost of energy. Rwandan research institutions need support to develop appropriate energy technologies, efficiency measures, and locally appropriate guidelines for sustainable resource extraction and development.

The following policies will be adopted to advance research, development, technological transfer and innovation in the energy sector:

- i. MININFRA shall work with MINEDUC through NCST to drive this process. The institutions shall also collaborate with Rwandan Universities to organize Energy Research Symposium with private sector participation to enhance dialogue and cooperation on practical energy research and technological innovation matters;
- ii. To encourage private sector and academic institutions to undertake research in developing and adopting new energy technologies to inform future investment decisions, especially related to cleaner energy resources;
- iii. Industrial training and practical skills related to energy shall be promoted through technical and vocational colleges as well as through practical pupilage programs;
- iv. To develop specific mechanisms to encourage more academics and researchers, particularly in the higher education sector, to focus their research on topics aligned with national energy priorities.

3.6 ENERGY SECURITY AND DISASTER MITIGATION

Fuel supply shocks can result not only in economic, but also in political and social instability. In the Rwandan context, “energy security” encompasses the following policy imperatives:

- Promoting self-reliance through the development of domestic energy resources to the greatest extent feasible from an economic and technical perspective;
- Diversifying the energy mix (including power generation portfolio) to decrease reliance on any one single resource;
- Limiting the degree of power imports to within a reasonable threshold to mitigate supply risk linked to political insecurity or technical system failures beyond Rwanda’s control;
- Having a sufficient level of energy commodity reserve stocks or capacity;
- Improving the preparedness for, and resiliency to, exogenous market shocks, including price spikes;
- Ensuring a consistent availability of public funds committed to co-finance major energy infrastructure projects with the private sector, as part of financing plans and strategies;
- Gradually reducing reliance on external development partner contributions to be more self-reliant;
- Preventing catastrophic failure and mitigating the impact of a severe natural disaster that could cripple the economy.

In order to enhance energy security, the following actions shall be taken:

- i. A clear **disaster prevention and management plan** including specific anticipatory risk mitigation measures shall be developed for each sub-sector by the respective competent Ministry or Agency. While ensuring security over energy supplies falls under the mandate of MININFRA, all Ministries and agencies engaged in the delivery of energy services have a responsibility to undertake measures that uphold this principle. MININFRA shall ensure **mainstreaming of disaster prevention guidelines into operational policies as well as guidelines** to be followed by its implementation agencies;
- ii. A hydropower **climate-related risk assessment** shall be conducted to highlight major vulnerabilities to climate change, natural disasters, and other extreme weather events;
- iii. **Promoting a mix of energy supply and power generation options** by increasing investment in domestic resources, even if not at the lowest financial cost of production, and by expanding regional trade in all energy commodities to ensure sufficient supplies and reliable reserves.

3.7 INTEGRATED PLANNING AND SECTOR GOVERNANCE

As a complex sector encompassing diverse forms and carriers, it is important that clear linkages and investment strategies are made through integrated planning processes, both within the energy sector and other sectors. The benefits of more integrated planning processes include creating positive synergies and economies of scale between new infrastructure investments and minimizing unnecessary cost. The agricultural sector strategic plan, for example, implies a dramatic increase in the land under irrigation; this needs to be effectively coordinated with power system expansion, otherwise it could lead to grid instability. Thus, it is important that arrangements between energy and other sectors such as agriculture and mining be put into place in the long-term in order to ensure sustainable exploitation of scarce resources.

New investments in the electric power sector shall be in line with demand, based on: a sound forecast, taking into account complex factors such as demographic trends and industrial growth strategies; reserve margin requirements set in the Grid Code; the flexibility to meet sudden changes in demand and exogenous shocks; and the robust findings of a least cost power project development plan. Electrification plans shall be in greater alignment with industrialization, agro-processing, and urbanization strategies.

3.8 GENDER-BASED EQUITY, ENVIRONMENTAL SUSTAINABILITY AND CLIMATE CONCERNS

Exploitation of energy resources can lead to severe impacts on the environment and may result in greenhouse gas (GHG) emissions known to contribute to climate change. Likewise, climate change can have a severe impact on energy projects. The dominant modern energy source in the country, hydropower, is likely to be the most directly affected by climate change, because it is sensitive to the amount, timing, and geographical patterns of precipitation and temperature.¹⁴

Achieving the policy objectives related to environmental sustainability will entail elaborating clear planning criteria that influence the prioritization of new energy investments toward environmentally friendly and climate resilient energy infrastructure, promoting technological innovation and transfer, developing stronger national technology standards for energy products and services, and outlining clear environmental guidelines to be used for major energy investments and programs. Guidance toward harmonizing approaches to climate technology transfer and adoption shall be further taken from the EAC Climate Change Policy.

Among the priority actions to achieve this objective include:

¹⁴During 2004 and 2005, Rwanda suffered from a prolonged drought, drying up the seasonal rivers that were its primary source of electric power. The immediate impact of the situation was a doubling of electricity prices in the country.

- i. Introducing controls and systems in energy infrastructure planning and design processes to robustly address climate change and disaster risk management;
- ii. Progressively reducing the carbon intensity of the electricity grid¹⁵ through increased investment in and use of renewable energy resources such as micro-hydro, solar, and possibly geothermal power;
- iii. Promoting cleaner fuels and technologies for heating and cooking such as LPG, biogas, and modern biomass technology solutions in both households and institutions as well as more sustainable biomass energy consumption through promoting more efficient charcoal production practices, market transformation activities, fiscal reforms, and smart subsidies;
- iv. Aligning energy strategies to the green growth strategies and integrated infrastructure solutions, especially in secondary cities;
- v. Pursuing bilateral research and technology development cooperation with other governments and research centers.

More proactive efforts to increase the flow of climate finance into low-carbon energy projects ranging from renewable power generation projects to dissemination of improved cook stoves. This includes registration of projects and activities the UN Clean Development Mechanism (CDM) and Nationally Appropriate Mitigation Actions (NAMAs) falling under the United Nations Framework on Climate Change (UNFCCC) as well as voluntary carbon market channels.

The Rwandan Constitution assures equal rights between women and men, especially as it relates to national development policies. Gender concerns shall be mainstreamed across energy planning processes.

Guidelines for gender mainstreaming formulated by MIGEPROF shall be adopted in energy planning strategies. In practice, this means fundamentally recognizing that men and women can have different roles, responsibilities, and decision-making powers over energy usage. A more market-oriented approach to energy sector development and policy interventions shall also take gender differences into account in relation to end-user needs, preferences, and behaviors.

Measures to mainstream gender in national energy planning and policies include following:

- i. Considering gender issues at every stage of the energy project cycle and in all major sub-sector strategies and action plans developed;
- ii. Addressing energy concerns in a gender-sensitive manner shall be undertaken in the process of identifying and evaluating *appropriate* technologies for any given service;

¹⁵The current carbon intensity of the grid is roughly 0.52 tons of CO₂ equivalent emissions per Megawatt Hour.

- iii. Proactively targeting female-headed households in awareness-raising and behavioral change programs focused on sustainable energy and clean cooking technologies;
- iv. Undertaking education, outreach, and awareness-raising activities focused on identifying and altering cultural norms, behaviors, structures and practices that can lead, whether intentional or not, to inequitable energy access;
- v. Addressing knowledge gaps in gender and energy, through research and advocacy programs and providing information support to improve women’s access to energy services in Rwanda;
- vi. Developing credit enhancement and micro-finance programs specifically targeting women for driving investments in clean energy technologies, such as solar powered lamps, and promoting women as energy entrepreneurs;
- vii. Incorporating meaningful roles to women in the planning, design and execution of energy programs, including those relating to energy efficiency and conservation;
- viii. Encouraging girls to study sciences and mathematics and courses related to building knowledge of energy technologies and basic engineering.

CHAPTER FOUR: LEGAL, REGULATORY, AND INSTITUTIONAL FRAMEWORK

4.1 LEGAL AND REGULATORY FRAMEWORK AND IMPLICATIONS OF REVISED POLICY

The main laws and regulations connected to the exploitation and use of Rwanda's energy resources comprise the Investment Code (2008, pending revision, 2014), Electricity Act (2011), the Law Establishing EWSA (2010) and the Law Repealing EWSA (2013), the Law Establishing and Determining the Mandate of the Rwanda Utilities Regulatory Authority (2001) and as revised (2013), the Law on Mining and Quarry Exploitation (2008),¹⁶ and the Petroleum Law (2013). A set of other proposed laws, including the Gas Law and Law on Public-Private Partnerships are still in final draft, pending approval by Cabinet. The mandate to regulate business operations across all energy subsectors falls under the Rwanda Utilities Regulatory Authority (RURA). As an independent regulatory agency, RURA is obliged to regulate in an accountable, transparent and fair manner for the benefit of all stakeholders.

Ultimately, the existence of a clear legal and regulatory framework for the sector plays a fundamental role in boosting investors' confidence in Rwanda and attracting more private sector operators. The action agenda for strengthening the legal and regulatory framework to align with the policy includes revising current legislation and putting in place new laws, regulations, and technical guidelines and standards. This includes potential new laws specific to promoting renewable energy and energy efficiency. A legal study is currently being implemented to examine the consistency of the legal framework and its adequacy to attract more investment in cleaner energy investments. In the longer-term, consolidation and integration of various laws and regulations into a unified national energy law shall be pursued. New legislation shall be benchmarked with other East African countries, and attempts made to harmonize regional frameworks wherever possible.

4.2 INSTITUTIONAL FRAMEWORK

Given the complexity of the sector and its diverse resource base, the mandate of developing the sector is shared across multiple institutions. There is continuous need and efforts to streamline the sector institutional framework to enable integrated resource planning and support improved inter and intra institutional decision-making, avoiding duplication of efforts. The following section outlines some of the key actors in the energy sector and their respective roles, while making recommendations on institutional reform.

- **Ministry of Infrastructure (MININFRA)**

The Ministry of Infrastructure (MININFRA) is the lead Ministry responsible for developing energy policies and strategies, and for monitoring and evaluating projects and program

¹⁶ Under the national Mining Law, and Ministerial Order N°003/Minifom/2010 on Requirements for Granting the License for Purchasing and Selling Mineral Substances in Rwanda, peat is classified as a mineral substance. Furthermore, a quarry extraction license is required for commercial development and use in the context of an energy project.

implementation. It is in charge of setting an enabling policy and legal framework for the sector, including a suggested general approach to the optimal use of state subsidies in the sector, budget preparation, resource mobilization (together with MINECOFIN), and political oversight over government programs designed to expand energy access and service provision. With regards to petroleum, it is in charge of developing and managing petroleum related infrastructure.

- **Ministry of Trade and Industry (MINICOM)**

MINICOM is responsible for the development and oversight of the downstream¹⁷ petroleum subsector, including implementation of the downstream petroleum policy, establishing and developing petroleum-related legislation, setting the strategic reserve requirement, and creating an enabling environment for petroleum products trade in line with the national energy policy objectives.

- **Ministry of Finance and Economic Planning (MINECOFIN)**

The Ministry of Finance and Economic Planning leads on resource mobilization to support energy investment and related financing requirements. MINECOFIN ensures the fiduciary framework to manage grants, loans, and other concessional finance from development partners into the sector.

- **Ministry of Natural Resources (MINIRENA)**

The Ministry of Natural resources is responsible for ensuring the sustainability of natural resources exploitation, including water extraction, and for developing and managing compliance to the national environment policy and law. MINIRENA is in charge of developing and implementing policies on petroleum exploration and development until the point of resource extraction.

- **Ministry of Education (MINEDUC)**

The Ministry of Education and its affiliated research agencies (NIRDA and NCST), plays a role in the energy sector by building the competency and human resources base for sector development and by helping to link sector policies and strategies to research, technology development, and innovation. MINEDUC ensures that TVETs address skill shortages in the sector, including jobs related to electrical engineering and renewable energy technology installation and maintenance.

- **Ministry of Local Government (MINALOC)**

Local governments have the authority and mandate to coordinate the implementation of discrete enabling policies to drive local economic transformation. Districts are responsible for

¹⁷ In Rwanda's case, this refers to the marketing and distribution of petroleum products and natural gas.

maintaining the District's infrastructure. Specifically, they have direct responsibility for all decentralized service delivery, including those that may be related to energy at the grassroots (such as ICS, Biogas and many more). This includes national programs to scale up sustainable energy consumption currently being implemented by the electricity utility targeting communities.

- **Ministry of East African Community (MINEAC)**

The Ministry for East African Community Affairs is a coordinating body for EAC and Rwandan priorities within EAC Protocols, Treaties and Strategies. MINEAC follows commitments signed by Rwanda on energy projects and ensures Rwanda and Partner States deliver on them. The Ministry advocates on energy-related government positions and interests in regional meetings and forums.

- **Rwanda Energy Group Ltd (REG Ltd)**

The legal mandate of Rwanda Energy Group Ltd is to translate energy sector policies and programs into the implementation of tangible projects to achieve government's vision in the sector and to efficiently operate and maintain the country's power transmission system.

- **Rwanda Development Board (RDB)**

Rwanda Development Board plays the lead role in investment mobilization and promotion for the energy sector, acting as a gateway and facilitator. It actively promotes private investor participation in the energy sector, including local financial institutions. It leads on facilitation of foreign direct investment (FDI) into strategic energy generation projects, as well as other programs and activities involving cleaner, more energy-efficient technologies. RDB also issues Environmental Impact Assessments for all energy projects for which one is required. It is expected to also host a centralized authority or advisory agency for PPPs across government.

- **Rwanda Utilities Regulatory Authority (RURA)**

The scope of its mandate extends to public utilities involved in renewable and non-renewable energy, electricity, industrial gases, pipelines and storage facilities, and conventional gas extraction and distribution. As the regulator, RURA's principal mandate is to ensure consumer protection from uncompetitive practices while ensuring that such utilities operate in an efficient, sustainable, and reliable manner. RURA also has the important role of updating the electric grid code, ensuring quality of service standards for power, assessing and reviewing energy tariff structures, licensing all power generation, transmission, and distribution companies as well as retail petroleum filling stations and related storage facilities.

- **National Industrial Research Development Authority (NIRDA)**

Its scope will evolve around continuous research on energy mix to feed the growing industries and will also provide the necessary information after thorough research on which industries employ clean efficient energy needs.

- **Rwanda Environment Management Authority (REMA)**

REMA has the mandate to coordinate, oversee and implement environmental policy. Generally speaking, all infrastructure development is subject to environmental impact assessment. REMA is mandated to enforce environmental compliance in the development of energy resources.

- **Rwanda Standards Board (RSB)**

As an agency under the Ministry of Trade and Industry, RSB develops national technical regulations including national technology and performance standards. RSB plays an increasingly important role in establishing, publishing, and disseminating national standards for energy technologies such as biogas digesters and solar appliances.

- **National Commission of Science and Technology (NCST)**

NCST with aid from higher institutions of learning, will continue to oversee the scientific tools and provide modern necessary technology to be employed in the energy sector.

CHAPTER FIVE: POLICY MONITORING AND IMPLEMENTATION PLAN

The National Energy Policy will ensure high-level ownership and institutional co-ordination to achieve the EDPRS II and ESSP targets. An overview of the institutional division of responsibility is set out in the Policy Implementation Matrix. This demarcates clear lines of institutional accountability and demonstrates the political will behind the process of energy sector development and increasing private sector participation.

MININFRA and the eSWAP Secretariat shall regularly monitor and evaluate the implementation of the policy so as to ensure its benefits reach all Rwandans. They will oversee government-wide policy implementation and enforcement, while helping to continually refine guidelines and processes to promote integrated energy planning. In this regard, they will regularly monitor and engage with other Ministries and their agencies according to Institutional Responsibility/Policy Implementation Matrix provided in the Annex.

High level oversight of policy implementation will be the mandate of the Economic Cluster under the Chairmanship of MINECOFIN, and if necessary, the PS Forums shall be used to raise awareness of areas where policy implementation is lagging. In addition, additional technical-level working groups and subsector coordination mechanisms to be established under the Energy Sector Working Group will ensure continual dialogue and awareness of the key policy objectives among key stakeholders such as MINECOFIN, REG Ltd, RDB, RURA, MINIRENA, RSB, and representatives of private sector chambers or associations. The SWG will support MININFRA in policy monitoring, evaluating progress against sector performance and intended policy outcomes. This may include, but is not limiting to, initiating and/or endorsing impact evaluations and interim policy reviews in conjunction with regular performance assessments against sector delivery targets.

The financial implications of this policy are complex, since it involves an array of institutions and a number of measures that are both already budgeted, as well as new measures. The ESSP estimates that roughly US\$ 4 billion is required to finance Rwanda's energy goals over five years. MININFRA has elaborated an extensive draft MTEF for negotiation with MINECOFIN which fully incorporates all of the different elements envisioned in the policy and strategy, clearly articulated and disaggregated by energy sub-sector.

An appropriate mix of financing resources will be used to implement the policy and strategy. In order to reach sector targets, significant levels of new private sector investment are required. This will be leveraged through strategic public investments in upstream resource and project development activities, as well as through risk reduction tools. Among intended investment risk mitigation strategies include the provision of sovereign guarantees for those projects as deemed absolutely necessary to support strategic infrastructure by MININFRA and the RDB Strategic Investment Unit.

In addition, as outlined in the Investment Code, a number of new measures shall be instituted to enhance the attractiveness of investors to fund energy projects, and energy is treated as a

strategic sector. It is assumed that many energy projects in Rwanda will require a minimum amount of 30% equity, with the balance raised between commercial and concessional debt as well as grant funding, whether up front or paid upon delivery of predetermined output results. Wherever possible, climate finance mechanisms will be drawn upon to co-finance appropriate financing structures for specific investment projects and major government programs in the sector. Increased engagement between policy makers and domestic banks, pension funds, and insurance companies will be pursued in order to identify promising areas for domestic capital investment growth.

A more detailed financing strategy for the implementation of the policy is elaborated in the energy sector strategic plan.

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Annex I: Institutional Responsibility Matrix – Policy Monitoring Plan

| | MININFRA & Agencies | REG Ltd | MINICOM | MINECOFIN | RURA | RDB | MINIRENA | REMA | RSB | NICA | MINEDUC | MINEAC | MIGEPROF/ GMO | NCBS | NCST | MINALOC | MINIJUST | MINISANTE | MIDIMAR | RPPA | RNRA |
|--|---------------------|---------|---------|-----------|------|-----|----------|------|-----|------|---------|--------|------------------|------|------|---------|----------|-----------|---------|------|------|
| General/Cross Cutting | | | | | | | | | | | | | | | | | | | | | |
| Develop Energy Sector Action Plans | 🎯 | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | | ◆ | | | | | |
| Develop a medium-term human and institutional capacity development plan for energy sector | 🎯 | ◆ | ◆ | ◆ | | | ◆ | | | | ◆ | | | ◆ | ◆ | ◆ | | | | | |
| Mainstream and monitor gender equity directives and compliance to related legislation in energy sector programs and policies | ◆ | ◆ | | | | | | | | | | | 🎯 | | | | | | | | |
| Integrate climate change considerations into major energy infrastructure plans | 🎯 | | | | | | ◆ | ◆ | | | | ◆ | | | | | | | | | |
| Electrification | | | | | | | | | | | | | | | | | | | | | |
| Elaborate annual action plan to reach 100% access to electricity in schools, sector offices and health centres by 2017. | 🎯 | ◆ | | | | | | | | | ◆ | | | | | ◆ | | ◆ | | | |

| | MININFRA & Agencies | REG Ltd | MINICOM | MINECOFIN | RURA | RDB | MINIRENA | REMA | RSB | NICA | MINEDUC | MINEAC | MIGEPROF/ GMO | NCBS | NCST | MINALOC | MINIJUST | MINISANTE | MIDIMAR | RPPA | RNRA |
|---|---------------------|---------|---------|-----------|------|-----|----------|------|-----|------|---------|--------|------------------|------|------|---------|----------|-----------|---------|------|------|
| Energy Efficiency/Demand-Side Management | | | | | | | | | | | | | | | | | | | | | |
| Develop and adopt Law on Energy Efficiency | ⊙ | ◆ | | | ◆ | | ◆ | ◆ | ◆ | ◆ | | ◆ | | | | ◆ | ◆ | | | ◆ | |
| Establish an energy efficiency and demand-side management program within Utility | ⊙ | ◆ | | ◆ | ◆ | | | | | | | | | | | | | | | | |
| Establish a working group to harmonize energy efficient labelling and standards for appliances in the EAC | ◆ | ◆ | | | ◆ | | | ◆ | ⊙ | ◆ | ◆ | ◆ | | | | | | | | ◆ | |
| Petroleum | | | | | | | | | | | | | | | | | | | | | |
| Adopt Secondary regulations on downstream petroleum activities including enforcement of products quality standards and strategic reserve requirements | ◆ | ◆ | ◆ | ◆ | ⊙ | ◆ | ◆ | ◆ | ◆ | ◆ | | ◆ | | | | ◆ | | | | | ◆ |
| Geothermal | | | | | | | | | | | | | | | | | | | | | |

| | MININFRA & Agencies | REG Ltd | MINICOM | MINECOFIN | RURA | RDB | MINIRENA | REMA | RSB | NICA | MINEDUC | MINEAC | MIGEPROF/ GMO | NCBS | NCST | MINALOC | MINIJUST | MINISANTE | MIDIMAR | RPPA | RNRA |
|---|---------------------|---------|---------|-----------|------|-----|----------|------|-----|------|---------|--------|---------------|------|------|---------|----------|-----------|---------|------|------|
| Adopt Geothermal Resources Law and Secondary Regulations for Sustainable Geothermal Exploration & Development | ⊙ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | ◆ | | | | ◆ | | | | ◆ | ◆ | | | | |
| Biomass & Peat | | | | | | | | | | | | | | | | | | | | | |
| Improve national peat resource mapping and quality assessments | ⊙ | ◆ | | ◆ | | | ◆ | ◆ | ◆ | | | | | | | | | | | | ◆ |
| Facilitate bilateral R&D cooperation activities to optimize peat energy resource uses | ⊙ | | ◆ | | | | ◆ | | | | ◆ | | | | | | | | | | |
| Updated national ICS and biogas technology standards | ◆ | ◆ | | | ◆ | | ◆ | ◆ | ⊙ | | ◆ | | | | | ◆ | | ◆ | | | |
| Development of Biomass resource and supply | ◆ | ◆ | | ◆ | | ◆ | ⊙ | ◆ | | | | | | | | ◆ | | | | | ◆ |
| Biomass to Energy technologies' development | ⊙ | ◆ | | | ◆ | | | | ◆ | | ◆ | | | ◆ | | ◆ | | | | | |

Annex II: Prevailing legal and regulatory framework

No one single law or set of regulations governs the entire energy sector. Activities and investments are governed by a set of stand-alone laws and regulations specific to each individual subsector. Most but not all of the above references sub-sectors have their own law covering the exploitation, utilization, and sales of energy resource. The general legal framework or hierarchy includes several national laws that are indirectly applicable to activities in the energy sector, laws specific to a particular energy sub-sector, regulations in force for a particular sub-sector, as well as technical guidelines, codes, and standards in place that may or may not be legally binding. A high-level overview of the key laws and regulations applicable to each of these sub-sectors is provided below. It is not intended to be an exhaustive inventory, but rather a tool to inform decision-makers, investors, and researchers on the key legal and regulatory frameworks that shape governmental policy, program implementation, and investment incentives.

The principle laws and related regulations connected to the exploitation and use of Rwanda's energy resources comprise the Investment Code (2014), PPP Law (2014), Electricity Act (2011), the Law Establishing EWSA (2010) and the Law Repealing EWSA (2013), the Law Establishing and Determining the Mandate of the Rwanda Utilities Regulatory Authority (2001) and (2013) respectively, Organic Law on Environment (2005) and the Petroleum Law (2013). A set of other proposed laws, including the Gas Law, are still under development.

The mandate to regulate business operations across all energy subsectors falls under the mandate of the Rwanda Utilities Regulatory Authority (RURA). As an independent agency RURA is obliged to regulate in an accountable, transparent and fair manner for the benefit of all stakeholders.

Main Cross-cutting laws and regulations applicable to sector

01) Investment Code (2014). The RDB has been in the process of updating the investment code applying to all strategic and foreign investors in 2014. Energy is treated as a strategic sector and a number of specific fiscal and other incentives are outlined in the code to promote greater investment and private sector engagement in the energy sector.

02) Public Private Partnerships Law (anticipated 2014). Providing the legal framework for the implementation and management of PPPs, this law clarifies the rules governing Public-Private engagement and procurement. It provides a streamlined framework for PPP approvals and procurement as an alternative to public procurement methods. Ministries will need to undertake feasibility studies to show the viability and advantages of using a PPP procurement approach versus public procurement methods. The law provides for sector-specific rules for the procurement of PPP projects to be developed by relevant line ministries.

03) Organic Law on Environment (2005). Rwanda's National Environment Policy is legally codified in the Organic law n° 04/2005 of which was adopted in August 2005, determining the modalities of protection, conservation and promotion of environment originating in the Ministry of Natural Resources and with guidelines to be implemented by the Rwanda Environment Management Authority (REMA). Article 73 of the Environmental Law notes that industries that import equipment and which assist in eliminating or reducing atmospheric carbon dioxide and chlorofluorocarbons and those which manufacture equipment that reduce the pollution of the environment are subject to reduction of customs duty on the equipment, which shall be administered under the law concerning taxes and revenues. It should also be noted that the Environment Law affords an opportunity for the Treasury to establish regulations to reduce income taxes for individuals and persons undertaking activities that promote the environment. Ministerial Order N° 003/2008 lays out the procedures and requirements for undertaking EIA while Ministerial Order N° 004/2008 outlines the list of works, activities, and project types that are subject to completing an EIA.

04) Law Establishing RURA (2013): The Rwanda Utilities Regulatory Authority (RURA) is an autonomous public entity that was initially created by the Law N° 39/2001 of 13 September 2001 with the mission to regulate specified public Utilities including electricity and the extraction and distribution of gas from Lake Kivu. This law was replaced by Law N° 09/2013 of 01/03/2013 establishing and determining RURA's mission, powers, organization and functioning. The revised law gives RURA the mandate to regulate, among others, electronic technologies, renewable and non-renewable energy, industrial gases, pipelines, and storage facilities. The law gives the regulator the legal authority to contribute to energy policy making, licensing of energy service providers, and the protection of energy consumers. Chapter II article 7 gives the regulator the legal mandate to regulate tariffs and other charges related to electricity among other regulated utilities. RURA shall carry out regular reviews of tariffs and charges required by providers of regulated services, taking into consideration the costs of production and supply, the return on assets, the consumer's and the investor's interests and the desire to promote competitive tariffs. Under Ministerial Order 4/DC/04 OF 07/06/2004, RURA is allowed to collect 1% of the previous year's annual turnover of the electric power utility for its operations.

Electric power laws and regulations

Electricity Law (2011): The main legal instrument for the power sector is Law N°21/2011 of 23/06/2011 governing electricity activities in Rwanda, which is progressive and forward looking. The law aims to create an enabling environment for the development and distribution of electric power for the entire population and for all sectors. It covers the general market set-up, as well as the licensing regime for the production, transmission, distribution and trading of power within and outside of the national territory.

- **Market structure.** The electricity market shall be a market-based one based on free and equal access to the activities of electricity production, transmission and distribution. Electricity transmission and distribution activities shall be non-discriminatory, and based on tariffs approved and published by RURA; however, transmission or distribution through the grid may be denied where such grid is of a low capacity or where granting it would cause prejudice to existing grid users (Article 27 and 28).
- **Tariff setting.** Principles relating to determining electricity tariffs shall be prepared by the regulatory agency and approved by the Minister in charge of electricity (Article 29). After consultation with the Minister concerning the amount of the State subsidy, RURA sets tariffs in accordance with the regulations (Article 30). These must ensure that the investor has a normal return on his/her investments. The capital investment shall be determined on the basis of infrastructure and equipment value used for the project implementation (Article 32).
- **Power concession agreements.** MININFRA, through the Minister in charge of electricity, has the power to issue concession agreements related to electric power generation.
- **Licensing.** A license is required by all market participants undertaking generation, transmission, distribution, purchasing, or trading operations both within and outside the national territory. This shall be issued by RURA and payable against a fee as determined by the agency. (Articles 4 to 7). Licenses shall be granted within sixty (60) days after a concession has been obtained. Depending on the content of the license, the holder of a license for electricity production shall have the rights and responsibilities to construct, operate, maintain and manage his or her electricity production facilities, contract for delivery and sale of electric power generated in his or her production unit, and connect to the transmission and distribution grid.
- **Autonomous generation and wheeling.** The Law provides for the operation of a project meant for autonomous electricity production. Projects with an installed capacity of less than fifty kilowatts (50 kW) are exempted from a license altogether and not subject to any prior notification to the regulator. Under the Law Establishing RURA, activities of

production, transmission and distribution of electricity through transmission and distribution power plants and grids established by a company or a household for their own consumption, or for consumption by other companies thereto, shall be authorized (article 36). Where such power plants are established within private properties, there must be no violation of public and State private domain.

02) Law repealing EWSA: The law establishing EWSA (N°43/2000 of December 2010) merged RECO& RWASCO, the former national parastatal companies in charge of energy and water distribution, giving rise EWSA. A new policy vision to “corporatize” the utility, however, gave rise to the adoption of the Law Repealing EWSA (Law N°97/2013), which repealed the 2010 law and essentially reversed its intent. The new law mandates a separation between the electric power utility and the water and sanitation utility. All legal and financial responsibilities and obligations from EWSA have been fully transferred to the newly registered companies (REG Ltd and WASAC Ltd).

03) Regulations for electric power resources exploitation: With specific reference to the electric power sub-sector, RURA has as its core role to regulate electric power production, transmission, supply and distribution, as well as sales. In reviewing electricity tariffs and ensuring compliance to the adopted standards, RURA works to enforce fair competition between operators.

04) Rural Electrification licenses: A rural electrification license is not precisely defined in the Electricity Law. RURA has drafted a regulation for simplified licensing procedures in order to expedite off-grid and mini-grid based rural electrification.

05) Electricity licensing regulations: RURA is responsible for issuing permits and certificates to all electrical operators that satisfy the licensing requirements outlined in the Electricity Law (2011). The regulations on electricity licensing (**N° 002/energy/el/rura/2013**), which came into effect on 25 July 2013, establish a framework for undertaking electricity activities with a view to an efficient, effective, sustainable and orderly development of electricity supply operations. Chapter III of the regulations outlines the different categories of licenses required in this context, including production, transmission, domestic and international trade. These regulations do *not* govern concession licenses or agreements.

- **Production (generation) license:** A license holder shall have the right to generate electrical power and sell it to other licensees or large scale customers inside the country and to access transmission or distribution networks, however, prior to the approval by RURA of the contractual agreement between the license-holder and the relevant transmission or distribution company is required by law.

- **Transmission license:** License-holders for the transmission of electricity must comply with Article 17 and shall have the right to buy/transmit/sell electrical energy on their network to other Licensees or consumers connected to the transmission network inside the country. The license-holder shall also have the right to access the transmission network in accordance with any contractual agreement subject to prior approval by RURA. This transmission network can also be used for communication purposes as long as it does not negatively affect the performance of the transmission network. Articles 11 and 12 of these regulations stipulate the rights and obligations for license holders to undertake domestic and international trade (Regulation **No. 002/energy/el/rura/2013**, July 2013)
- **Distribution license:** In addition to needing to comply with Article 18 of the Law governing electricity in Rwanda, license holders for the distribution of electricity shall have the right to purchase electrical power from the transmission company or any other Licensee and to sell it to other Licensees or consumers inside Rwanda, consistent with license conditions set by RURA.

06) Regulations for electric power quality: In August 2013, RURA published the Rwandan Grid Code which establishes the rules and procedures that allow all participants to use the interconnected power system in a safe, reliable, efficient and economical manner. In connection with ensuring reliability, RURA is responsible for the compilation, approval, implementation, of the Grid Code which encompasses a set of technical guidelines for guaranteeing the principles above. RURA monitors and evaluates the quality of services provided by electricity service providers, assuring conformity to the Grid Code and licensing requirements. A Grid Code Advisory Committee shall be regularly constituted to recommend appropriate updates and revisions to the Code. Individual generation plants which do or potentially could threaten the stability of the grid and the power quality standards under the Grid Code would therefore be subject to rejection, revocation, or suspension of their licenses.

07) Regulations on Renewable Energy Feed-in Tariffs (REFIT): Law 09/2013 of 01/03/2013 establishing RURA gives it the legal mandate to establish and regulate electricity tariffs in consultation with the Minister in charge of energy and REG. Following the recommendations of a study conducted in 2012, a set of regulations determining feed-in tariffs for micro-hydro projects ranging from 50 kW to 10 MW were developed (Annex 1 of regulations 01/energy/rura/2012 of 09/02/2012). Tariff levels reflected a cost recovery plus return basis to encourage mobilization of private investors. RURA undertook a review of the existing regime in 2013 to better align tariffs to market realities, and drafted an updated regulation. This is reflected in, and has been incorporated into the EP objectives.

08) Draft regulations on solar water heaters installation: RURA drafted regulations on mandatory installation of solar water heaters and guidelines on installation, as well as rules for the accreditation of installers and the issuing of permits for conducting this trade. This builds upon technical guidelines that were published in November 2012 describing how solar collectors especially those larger than 4m² can be safely installed on roofs: *Guidelines for Solar Water Heaters Installation*. The guidelines target suppliers, installers and building consent authorities to improve the quality of installation of solar water heater systems, providing a range of options and performance-based solutions to end-users.

09) Electrical installations regulations: Regulation N° 002/el/energy/rura/2012 adopted by RURA in October 2012 covers requirements for undertaking electrical installations, aiming to protect people, properties, and the environment from hazards that can arise under both normal and faulty conditions. It applies to installations in all premises, whether residential, commercial, public or industrial and outlines the corresponding required permits, depending on the complexity of the installations.

Technical guidelines on utilization of energy solutions

01) Energy Efficiency Promotion: RURA adopted *Guidelines Promoting Energy Efficiency Measures* in May 2013, outlining specific measures to enhance efficient use of electricity. Technical guidance and a number of useful tips for saving electricity on common uses and appliances are provided to different targeted end-users such as business/industry, large public institutions, and residential consumers. All energy facilities are encouraged to meet Minimum Energy Performance Standards (MEPS) that effectively limit the maximum amount of energy that may be consumed by a single product per specified task. The guidelines stipulate that all energy consuming appliances and equipment bear labels and meet MEPS for efficient energy use and conservation.

02) Electrical power standards: Related to regulations on electrical installations, RSB has enacted over a dozen different power quality standards concerning electric and optical fiber cables, wiring, plugs and outlets, lamps and luminaries, etc. Any person or company involved in electrical installations works who fails to comply with the above regulations is subject to revocation or suspension of permits and operating licenses. All electrical installations should comply with the provisions contained in the following standards; RS 565-1: 2011 (Electrical Wiring of Premises-Part 1: Low-voltage Installations), RS 474-1: 2011(Power Installations exceeding 1kV a.c.–Part 1: Common rules) and any other relevant standards issued by RSB which may include the following:

| | Electrical engineering standard | Rwandan National Standard and Year of Adoption |
|----|---|---|
| 41 | Electric and optical fiber cables-Test methods for non-metallic materials-Part 201:General tests-Measurement of insulation thickness | IEC 60811-201:2012 |
| 42 | Electric and optical fiber cables-Test methods for non-metallic materials-Part 202:General tests-Measurement of non-metallic sheath | IEC 60811-202:2012 |
| 43 | Electric and optical fiber cables-Test methods for non-metallic materials-Part 203:General tests-Measurement of overall dimensions | IEC 60811-203:2012 |
| 44 | Electric and optical fiber cables-Test methods for non-metallic materials-Part 401:Miscellaneous tests-Thermal ageing methods- Ageing in an air oven | IEC 60811-401:2012 |
| 45 | Electric and optical fiber cables-Test methods for non-metallic materials-Part 412:Miscellaneous tests-Thermal ageing methods- Ageing in an air bomb | IEC 60811-412:2012 |
| 46 | Electric and optical fiber cables-Test methods for non-metallic materials-Part 501:Mechanical tests-Test for determining the mechanical properties of insulating and sheathing compounds | IEC 60811-501:2012 |
| 47 | Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V – Part 5: Flexible cables (cords). | IEC 60227 - 5:2011 Ed2 |
| 48 | Polyvinyl chloride insulated cables of rated voltages up to and including 450/750V - Part 7: Flexible cables screened and unscreened with two or more conductors. | IEC 60227 - 7:2012 Ed2 |
| 49 | Power cables with extruded insulation and their accessories for rated voltages from 1 kV(Um = 1,2 kV) up to 30 kV(Um= 36kV) - Part 1:Cables for rated voltages of 1 kV(Um=1,2kV) and 3 kV(Um=3,6kV) | IEC 60502 -1:2009 Ed2 |
| 50 | Electric toys - Safety | IEC 62115 :2011 Ed2 |
| 51 | Safety requirement for electrical equipment for measurement, control, and laboratory use - Part 1:General requirements | IEC 61010-2:2010 Ed2 |
| 52 | Uninterruptible power supplies(UPS) - Part 3:Method of specifying the performance and test requirements | IEC 62040 - 3:2011 Ed2 |
| 53 | Electrical installations of buildings -Selection and erection of electrical equipment - Earthing arrangement and protective conductors | IEC 60364-5-54:2011 Ed2 |

| | | |
|----|--|-----------------------------|
| 54 | Incandescent lamps -Safety specifications - Tungsten filament lamps for domestic and similar general lighting purposes | IEC 60432-2:2012 Ed2 |
| 55 | Household and similar electrical appliances - Safety - Part2 - 7: Particular requirements for washing machines | IEC 60335 -2 -7:2012 Ed2 |
| 56 | Electrical installations of buildings - Part 4-42: Protection for safety - Protection against thermal effects | IEC 60364 – 4 – 42:2010 Ed2 |
| 57 | Luminaires -Part 2 - 2: Particular requirements. Section two: Recessed luminaires | IEC 60598 – 2 – 2: 2011 Ed2 |
| 58 | Plugs, socket-outlets, and socket-outlets and couplers for industrial purposes -part1: General requirements | IEC 60309-1:2012 Ed2 |
| 59 | Luminaires - Part 2-3: Particular requirements - Luminaires for road and street lighting | IEC 60598 -2 - 3:2011 Ed2 |
| 60 | Incandescent lamps - Safety specifications - Part 3: Tungsten halogen lamps (non-vehicle) | IEC 60432-3:2012 Ed2 |

Laws and regulations for petroleum sub-sector activities

The petroleum industry is typically divided into three major components i.e. upstream, midstream and downstream ends. In Rwanda, upstream regulations are not yet developed since petroleum exploration and exploitation activities are yet to be commercially developed.

01) Law Regulating Petroleum and Petroleum Products Trade: Law N°85/2013 OF 11/9/2013 applies to the import, export, transportation, processing, storage, distribution, wholesale and retail sale of petroleum and petroleum products in Rwanda, including LPG. The law provides clarity on licensing categories, requirements, procedures to be followed. Any person or company may free participate in the trade of petroleum products as long as they are licensed. Licensees must meet quality standards set out by relevant regulatory authorities. Various requirements for maintaining a strategic reserve of stocks are outlined.

02) Petroleum (Exploration and Production) Law: The law provides provisions for licensing, divided between exploration licensing and production licensing. Upon discovery of a resource, the holder of an exploration license may apply for a production license. The law further obliges companies to prioritize the employment of Rwandan citizens for managerial positions and provides other conditions for capacity development. The main regulatory tool for the management of petroleum resources is a system of licensing companies to carry out petroleum exploration operations in return for the performance of explicit and enforceable obligations. The objective of the licensing system is to allocate petroleum exploration rights to those

best able to conduct exploration activities and, to carry out commercial exploration and production of petroleum resources in an efficient and responsible manner.

03) Law Establishing the National Standards Inspectorate, Competition, and Consumer Protection Authority (NICA). Under Law No. 61/2013 of 23 August 2013, a new competent authority shall be established to ensure adherence to quality standards and pro-competition measures. It is envisioned under the downstream petroleum policy that NICA shall be at the core of efforts to enforce technical standards for the sub-sector.

A number of **regulations** have been passed to manage the importation and storage of petroleum liquid fuels, petroleum depots, use of LPG, as well as oil pipelines. RURA, in collaboration with Kigali City Council (KCC), RSB, MININFRA and MINICOM developed guidelines for the construction of petrol stations and these are currently being enforced by KCC. The following are some guidelines regulating petroleum business in Rwanda:

01) Regulations on above-ground Petroleum Storage Facilities (N°006/Energy/RURA/2012) adopted by RURA on 8 June 2012 determine the modalities of constructing and managing petroleum storage facilities in Rwanda. Any person intending to construct an above-ground petroleum storage facility (e.g., bulk storage, filling plant, and pipeline) must first obtain a permit subject to fulfilling certain prerequisites. All tanks, pipes, valves and pipe fittings shall be designed and built in accordance with approved national standards (i.e. API STD 650) and have a safety factor adequate for the conditions of service. Guidelines are also given on the design and construction of facilities used to store petroleum products of over 150 m³ in capacity. Preference is given to vertical tanks consisting of not more than one compartment and use of elevated tanks for petroleum storage are discouraged.¹⁸ Owners or operators of above-ground storage facilities or tanks shall prepare a spill prevention control and mitigation plan prepared in accordance with applicable national Environment, Health and Safety (EHS) guidelines and relevant national standards. Other regulations promulgated by agencies such as the Rwanda Revenue Authority and the APSF concerning the taxation, labeling, safe storage and disposal of hazardous substances are also material to such facilities.

02) Regulations for fluid transportation pipelines have been prepared by RURA.

03) Regulations on LPG: On 7 May 2012, RURA adopted Liquefied Petroleum Gas Regulation (No.005/RURA/2012) which covers the importation, transportation,

¹⁸Where deemed necessary, a special permit must be issued.

construction, storage and distribution, wholesale and retail trade of LPG. Licensing started in June 2013, initially mainly targeting big LPG dealers, with a plan to apply this to LPG retailers as well. According to the regulations, no person shall conduct a business of importation, transportation, supply, storage, distribution, wholesale and retail supply and sale to industrial consumers of LPG and related activities except under and in accordance with the terms and conditions of a license granted by RURA.

- **Importation:** Section III stipulates that importation of LPG into Rwanda shall only be carried out by entities holding a valid license from RURA. Furthermore, the vehicle used for importation must meet the requirements of RS 573 and RS 579. Where no national standard exists, the relevant international standards approved by RSB shall apply.
- **Filling:** LPG may only be filled into cylinders by a valid license holder issued by RURA. A licensee shall at all times ensure that LPG is contained in a secure cylinder that conforms to RS 569, RS 570, RS 571, RS 572, RS 574 and RS 576. The standard capacities of LPG cylinders shall be as specified in RS 569 & RS 570 and cylinders shall be fitted with unified valves. Cylinders not falling in the categories specified above are not allowed to be filled with LPG.
- **Distribution:** A “special license” may be granted to operators involved in multiple aspects of the LPG supply chain (e.g., importation, bulk storage, transportation, distribution, wholesale and retail). Any person intending to construct an LPG facility (bulk storage, filling plant, and pipeline) shall, before commencing such construction, apply in writing to RURA for a permit.

Technical guidelines for petroleum sub-sector activities

01) Technical guidelines on petrol stations: RURA issued technical guidelines for the construction of new petrol filling stations in 2011. To ensure public safety and worker health and safety compliance, RURA provides ongoing technical advice during construction. The guidance is based on a national standard established by RSB on “Installations, modification and decommissioning of underground storage tanks, pumps/dispensers, pipe work at service stations and consumer installation.” The guidelines provide minimum standards for the construction and operation of filling stations, specifications for underground storage tanks, environmental protection measures, fire preventions and fighting, calibration of equipment, waste water management, among others. A filling station should have at least the following minimum specifications:

- One underground storage tank for each petroleum product sold at the station with a minimum capacity of 5 m³
- One digital dispensing pump (two-way) for each petroleum product sold at the station. All dispensing pumps should be covered.

- One service bay, wash bay
- Office premises
- One wastewater drainage system and firefighting equipment

Laws and Regulations under the Biomass subsector

There are no general guidelines on the exploitation of biomass energy resources in Rwanda save for a few regulations on charcoal harvesting and technical guidelines on construction of biogas digesters issued by RURA. Details are discussed below.

01) Technical Guidelines on construction of fixed domestic biogas digesters: In September 2012, RURA issued technical guidelines for the construction of domestic fixed dome biogas digesters to be used by local construction companies as well as public enterprises. The guidelines aim to ensure for the quality and required productivity of digesters as well as the safety of end-users. Specifically, they cover responsibilities of a biogas plant constructor, plant design and gas production optimization, plant siting, feedstock requirements, and construction methods including appropriate materials to be used. The guidelines should be used by all those constructing fixed-dome biogas digesters for the main fixed dome plant models in Rwanda plant of 4, 6, 8 and 10 cubic meters capacity respectively. Any deviation from this should be after approval by a skilled technical supervisor with appropriate accreditation and licensing.

02) Regulations on Charcoal Harvesting. A permit is needed to cut mature trees; however, such a permit is not needed for own use. At national level, cutting young trees is prohibited. While carbonization is most efficient during the dry season, as dry wood gives a higher output per unit input, some districts prohibit charcoal production in this period to prevent fire outbreaks. A wood transport permit is needed from district authorities to bring products to market. For charcoal, the permit is limited to a particular Sector.

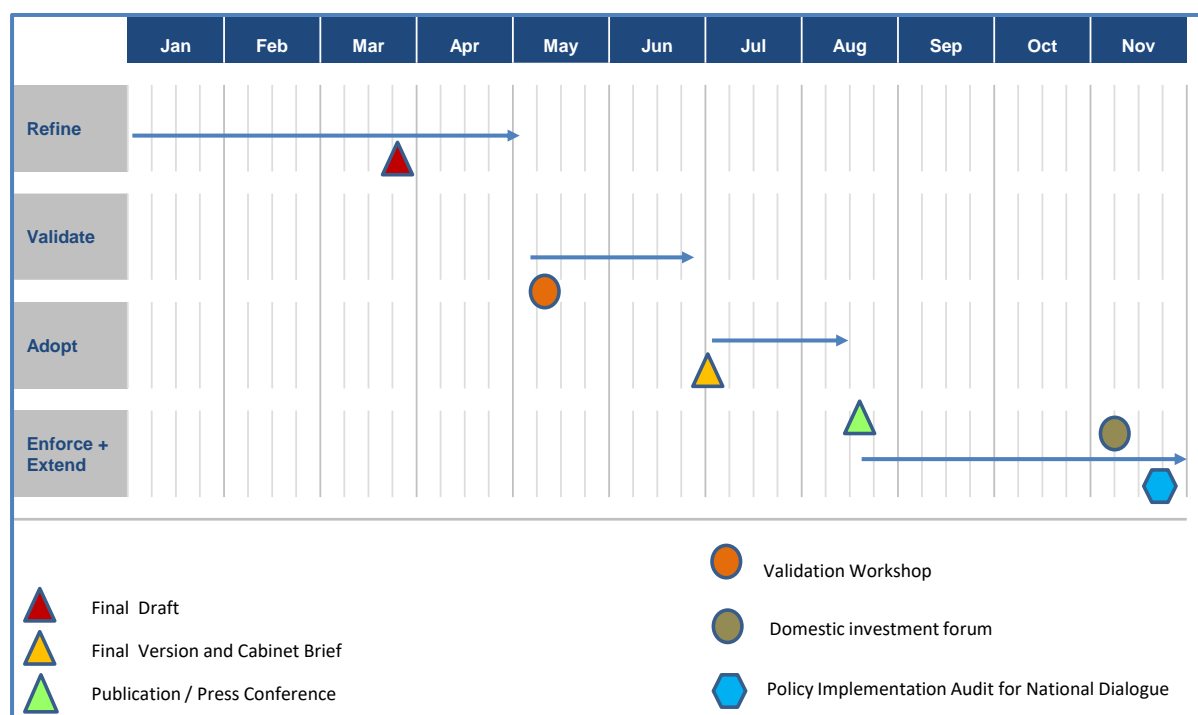
Technical Guidelines under the Biomass subsector

01) Technology standards for ICS. RSB has developed a technology standard for ICS.

02) Technical Guidelines on Construction of Cook Stoves. The former EWSA prepared informal technical guidelines on the construction of ICS, but compliance is not mandatory.

Annex III: Policy Road Map & Stakeholder Consultations

Perceiving a need to revise the existing energy policy (2011) to better align with new priorities and meet sector challenges, MININFRA initiated a process to update the policy in 2013. There was felt to be a strong need for the revised policy to reflect EDPRS-II targets, a new 5-year Energy Sector Strategic Plan (ESSP) drafted in 2012, as well as other major policy and regulatory shifts in the dynamic energy landscape. The policy was developed under a highly consultative approach involving all key stakeholders who were made aware of the road map and process for policy development. This road map, circulated in early 2014, indicated the main phases, activities, and timelines to be followed. The key stages were divided into: i) drafting; ii) refining; iii) validating; iv) adopting; and v) enforcing the policy. A high level-timeline for the road map is depicted below. Whilst the dates are no longer accurate due to delays in the finalization of the policy, it is presented here for illustrative purposes.



An initial policy “refining” retreat was held on 7 and 8 March 2014, in Musanze, where an initial draft was discussed among over twenty participants representing a core group of institutions involved in the sector. Policy priorities, challenges, and opportunities were discussed in small working groups. Following the retreat, a series of formal stakeholder consultation meetings were held over the course of April and May 2014. Approximately 50 different organizations from both within and outside of government were bilaterally consulted. These allowed for an exchange of views and receipt of critical inputs on the draft principles, goals, objectives, and strategic prioritization. The consultations were also a key

instrument for gaining stakeholders' clear appreciation for the new energy sector policy vision.

A national validation workshop was held on 12 June 2014 in Kigali at Lemigo Hotel, which was attended by roughly 75 participants from across government, civil society, development partners and the private sector. The meeting reached its objectives: (i) to give all stakeholders a clear understanding of the main policy objectives and vision for Rwanda's energy sector; furthering institutional consensus on the proposed key policy principles and objectives for each sub-sector; (iii) to harmonize inconsistencies, contradictions, and overlaps; and (iv) to identify any remaining gaps or critical views omitted from the final draft. On the basis of the validation workshop, a summary matrix of the policy was developed highlighting areas for further development and updating of the ESSP prior. A finalized version of this matrix is included in Annex IV.

Finally, an inter-ministerial consultation meeting was held in Kigali at MININFRA on 25 September at which time the final draft document was circulated for review and feedback, together with the updated ESSP. The purpose of the meeting was to ensure broad awareness of the final contents and to get final feedback prior to Cabinet submission and deliberations. A table summarizing the stakeholders and institutions consulted in the policy development process is below.

Consolidated List of Stakeholders Consulted

| | |
|--|-----------------|
| Private Sector Federation | Private-General |
| Energy Private Developers | Private-Energy |
| Rwanda Chamber of Industry | Private-General |
| Rwanda Renewable Energy Association | Private-Energy |
| Rwanda Mining Association-RMA | Private-Mining |
| Rwanda Mining Investment Forum-RMIF | Private-Mining |
| Petroleum Importers | Private-Energy |
| World Bank | DP |
| African Development Bank | DP |
| Belgian Technical Cooperation | DP |
| Japan International Cooperation Agency | DP |
| GIZ | DP |
| KfW | DP |

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| European Union | DP |
| World Vision | NGO |
| Action Aid | NGO |
| Care International | NGO |
| CIMERWA | Private-General |
| UTEXRWA | Private-General |
| RIG (PEC, REC, etc.) | Private-General |
| Ngali Energy | Private-Energy |
| BRALIRWA | Private-Manufacturing |
| Kabuye Sugar works | Private-Manufacturing |
| Ministry of Agricultural and Animal Resources | GoR-Ministry |
| Ministry of Finance | GoR-Ministry |
| Ministry of Foreign Affairs and Cooperation | GoR-Ministry |
| Ministry of Natural Resources | GoR-Ministry |
| REMA | GoR-Agency |
| Ministry of Gender and Family Protection /Gender Monitoring Office | GoR-Ministry |
| Ministry of Education | GoR-Ministry |
| Ministry of Commerce | GoR-Ministry |
| Ministry of Health | GoR-Ministry |
| Ministry of East African Community Affairs | GoR-Ministry |
| Ministry of Justice | GoR-Ministry |
| Rwanda Revenue Authority | GoR-Agency |
| Ministry of Local government | GoR-Ministry |
| Prime Minister's office | GoR-Other |
| Rwanda Utilities Regulatory Authority (RURA) | GoR-Other/Regulator |
| Rwanda Energy Group | GoR-Company |
| Rwanda Standards Board | GoR-Agency |
| Rwanda Development Board | GoR-Agency |
| National Women Council | GoR-Agency |

| | |
|--|------------------|
| Environmental and Natural Resources Authority | GoR-Agency |
| Nile Basin Initiative | Regional Org |
| CEPGL | Regional Org |
| NELSAP | Regional Org |
| SINELAC | Regional Org |
| City of Kigali | Local Government |
| University of Rwanda College of Science & Technology | Academia |
| IPRCs | Academia |

The following methods will be used to continue to inform and engage the public on the policy:

- Presentation of the policy document at the Energy Sector Working Group meeting and at a special meeting of the Private Sector Forum with energy investors.
- Posting of the document to the MININFRA website for easy download
- Distributing of the document at future energy seminars and workshops to be held with stakeholders
- Distribution of the document at investment promotion forums such as the Rwanda Power & Infrastructure Investment Forum
- Organize a series of sensitization workshops on the policy after its approval.
- Collaborate with MINAFET to distribute the policy to Embassies and consulates.
- Presentation to local districts via quarterly meetings organized by MINALOC.

In following summary table, a comprehensive overview of all National Energy Policy objectives and principles is provided. The table also highlights linkages between the energy policy and the EDPRS-II goals and cross-cutting thematic issues. Finally in the last column, it is shown how the policy directives are expected to be translated into headline implementation strategies under the Energy Sector Strategic Plan (ESSP). The legend further indicates how the policy actions and measures to be undertaken in support of the sub-sector objectives and global principles can be categorized.

Legend:

(P) A pure **policy** instrument, signifying a shift in approach, philosophy, or principle underlying strategic direction or implementation

(E) An **economic** instrument to affect desired policy outcome, including fiscal reform, public funding of a target investment program, investment incentives

(R) A **regulatory** instrument, including the adoption or amendment of a law or regulation to drive policy compliance, as well as the development of any related standards, codes, and technical guidelines.

(I) An **institutional** reform, such as a consolidation or re-organization of government agency mandates to implement the policy.

| EDPRS II | | NATIONAL ENERGY POLICY (EP) | | ENERGY SECTOR STRATEGIC PLAN (ESSP) | |
|---------------------------|--|---|---|--|---|
| | Overarching Goal | EDPRS II goals strongly linked to the energy sector | Overarching Goal | Core Objectives | High-Level Target Objectives (to be achieved by end of FY2018) |
| General (all Sub-Sectors) | <p><i>“Accelerate progress to middle income status and better quality of life for all Rwandans through sustained growth of 11.5% and accelerated reduction of poverty to less than 30% of population.”</i></p> | <p>Increased economic competitiveness, taking into account the role of energy as a productive input/catalyst.</p> | <p>Policy Vision:</p> <p><i>“To contribute effectively to the growth of the national economy and thereby improve the standard of living for the entire nation in a sustainable and environmentally sound manner.”</i></p> <p>Overall Goal:</p> <p><i>“To ensure all residents and industries can access energy products and services that are sufficient, reliable, affordable, and sustainable.”</i></p> | <p>Enhance access to modern, sustainable energy services for all Rwandans;</p> <p>Optimize the power generation mix in order to reduce long-run costs, promote energy security, and reduce the carbon-intensity of the grid over time.</p> <p>Create an enabling environment for increased private sector participation in energy supply and service provision;</p> <p>Encourage and incentivize more rational, efficient use of energy;</p> <p>Achieve cost-reflective provision of energy services, a gradual transition toward “smart subsidies,” greater market competition, and more transparent tariff-setting.</p> <p>Ensure the sustainability of energy exploration, extraction, supply, and consumption.</p> | <p>The electric power system equivalent installed capacity (domestic generation + imports) to 563 MW</p> <p>Increase household access to grid electricity to 48% and off-grid electricity to 22%.</p> <p>Achieve savings from energy efficiency measures of up to 50,000 MWh</p> <p>Reduce carbon intensity of the grid by 10% by 2018 and 25% by 2025 (from 2013 baseline).</p> <p>Ensure 80% of all households employ clean cooking energy technologies.</p> <p>Realize all EAC Regional Integration Policy priorities for energy sector.</p> |
| | | <p>Pursuit of a ‘green economy’ approach to economic transformation.</p> <p>Youth empowered and rural communities connected to economic opportunity through jobs and better infrastructure.</p> <p>An enabling environment for private-sector driven growth and socioeconomic transformation.</p> <p>Improved service delivery through accountable governance</p> | | | |

| EDPRS II | | NATIONAL ENERGY POLICY (EP) | | ENERGY SECTOR STRATEGIC PLAN (ESSP) | |
|------------------------|---|---|--|-------------------------------------|--|
| | Overarching Goal | EDPRS II goals strongly linked to the energy sector | Overarching Goal | Core Objectives | High-Level Target Objectives (to be achieved by end of FY2018) |
| Key Guiding Principles | <ul style="list-style-type: none"> Inclusive engagement and strong ownership by all stakeholders. Innovative approaches and home-grown initiatives fostered to address development challenges. Empower community and district-driven development and coordinate mutually reinforcing linkages between sector policy goals and decentralization strategies. Focus on emerging priorities, including “green growth” and overall sustainability. | | <ol style="list-style-type: none"> Promote integrated planning and streamline sector governance. Boost national ownership of Rwanda’s energy vision and build more decentralized implementation capacity (including through enhanced human, organizational and institutional capacity). Mainstream gender-based equity, environmental sustainability, and climate concerns into energy planning and sector strategies. Promote value-for-money and increased market competition in energy development. Transition from indiscriminate to “smart subsidies” aligned to social protection principles. | | |

| EDPRS II | | NATIONAL ENERGY POLICY (EP) | | ENERGY SECTOR STRATEGIC PLAN (ESSP) | |
|--|--|---|---|-------------------------------------|--|
| | Overarching Goal | EDPRS II goals strongly linked to the energy sector | Overarching Goal | Core Objectives | High-Level Target Objectives (to be achieved by end of FY2018) |
| Cross-Cutting Themes | <ul style="list-style-type: none"> • Capacity Building • Environment and climate change • Family and Gender • Regional Integration • HIV/AIDS and NCDs • Disaster Management | | <ol style="list-style-type: none"> 1. Regional integration 2. Energy technology standards, and related compliance and enforcement 3. Energy data collection and statistics 4. Energy research, development, and technological innovation 5. Energy security and disaster mitigation | | |
| Private Sector Participation/Engagement | <ul style="list-style-type: none"> • Private sector participation central to delivery strategy, particularly in energy sector. • Job creation and skills development through private-sector expansion and opportunity. | | <ol style="list-style-type: none"> 1. Streamline investment promotion processes for IPPs. 2. Accelerate energy sector Public-Private Partnerships (PPPs), taking advantage of new national guidelines and procurement procedures 3. Extend and expand investment incentives to private investors. 4. De-risk investments through financing risky upstream resource assessments and pre-feasibility studies. 5. Empower local enterprises to engage in energy sector deals and introduce more competitive, transparent approaches to service provision where appropriate. | | |

| EDPRS II | | NATIONAL ENERGY POLICY (EP) | | ENERGY SECTOR STRATEGIC PLAN (ESSP) | |
|-------------------|------------------|---|------------------|---|--|
| | Overarching Goal | EDPRS II goals strongly linked to the energy sector | Overarching Goal | Core Objectives | High-Level Target Objectives (to be achieved by end of FY2018) |
| Governance | | <ul style="list-style-type: none"> Reduce coordination failures through integrated planning and joint solutions to infrastructure development and service delivery. Strengthen citizen participation and demand for accountability. | | <ol style="list-style-type: none"> The shall convene and coordinate regular cross-sector planning meetings with regards to the National Energy Policy and Integrated Planning. Improve stakeholder communication, education, and public outreach mechanisms Revamp energy sub-sector coordination mechanisms and technical working groups. | |

| National Energy Policy Goal | Policy Objectives | Instruments & Corresponding ESSP Actions |
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| Electricity Sector | | |
| <p>Main policy objective:</p> <p>Ensure sufficient, reliable, sustainable and affordable power supply to all Rwandans</p> | <p>1. Reform the power sector in long-term to increase institutional accountability and operational efficiencies. Restructure EWSA into electricity utility, energy development, and water utility companies. (P)</p> <p>2. Transition to a cost-reflective yet affordable electricity tariff. (P), (E)</p> <p>3. Optimize the power mix so as to reduce long-run cost of service, diversify energy generation technologies, and gradually reduce the carbon-intensity of grid over time.</p> <p>Vision to reduce petroleum-based power generation over time so as to be used</p> | <p>1.1. EWSA restructuring and corporatization - a three phase process.</p> <p>2.1. Establish a “glide-path” to cost-reflectivity that reflects the principle of moving toward “smart subsidies” targeting strategic industries and vulnerable social groups vs. the indiscriminate subsidization of power.</p> <p>2.2. Achieve operational efficiencies in EUCL and implement energy efficiency and demand-side management programs to shave peak load and reduce required generation capacity.</p> <p>3.1. Ensure future energy demand is realistically forecasted and contribute to lowering the cost of electric power supply through improvements in analysis and planning effectively translated into National Power Master Plan and EAPP Power Master Plan.</p> <p>3.2. Power Master Plan and generation road map to achieve strategic balancing act between increasing net imports of expected demand, optimizing</p> |

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| | <p>only for peaking and back-up power by 2020. (P)</p> | <p>exploitation of domestic energy resources, and accelerating progress toward a regionally-integrated power market.</p> <p>3.3. Conclude economically advantageous trading agreements with regional power houses (net exporters) in line with technical constraints and energy security guidelines (i.e. import cap of up to a maximum of 20%.¹⁹</p> <p>3.4. Develop and enhance regulations facilitating regional trading arrangements.²⁰</p> <p>3.5. Gradually phase out expensive, petroleum-based generational capacity on a rental operational basis. Instead, build a utility-owned peaker power plant to cover peak demand and/or maintain a reserve margin to hedge against short-term power supply unavailability or import shocks.</p> <p>3.6. Short-term priority to be given to domestic methane gas for base load applications over hydro-based imports and petroleum-based generation sources. Develop other indigenous energy resources such as biomass and solar power subject to being as sustainable, affordable, and reliable compared to imports.</p> <p>3.7. Integrate findings of Strategic Environmental Assessment for the Energy Sector and other macro-</p> |
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¹⁹ Additional analysis by energy planning team is necessary to come up with justifiable target. A 30% target represents a big increase from status quo, while still maintaining a high level of energy security. Moreover, it is well in line with average import-export ratios of other countries in the region.

²⁰ Revised power tariff already paves way through unique transmission-related component.

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| | | <p>level climate risk and sustainability assessments into future power Master Plans and ESIA guidelines to be elaborated by REMA specifically tailed to power generation projects.</p> <p>3.8. Develop a strategy to access climate financing and incorporate into planning and budgeting processes to incentivise cleaner technologies and practices.</p> |
| | <p>4. Develop national electrical power system to serve growing demand in an economically efficient way and reduce technical and non-technical losses. (P), (E)</p> | <p>4.1. Utility to increase long-term investments in new generation capacity as well as transmission and distribution systems extension and rehabilitation.</p> <p>4.2. Accelerate implementation of system loss-reduction investment activities (technical and non-technical).</p> <p>4.3. Implement quick win supply-side energy efficiency measures, i.e. grid loss-reduction programs.</p> <p>4.4. Implement regional grid integration strategies and actions, taking into account required institutional, regulatory, technical, and investment reforms. Champion solutions associated with optimization of interconnected grids at regional level (e.g., EAC/EAPP technical meetings).</p> |
| | <p>5. Enhance the attractiveness of exploiting domestic resources for power generation and increase local private sector participation through government-funded risk mitigation mechanisms and IPP investment streamlining. Revise and</p> | <p>General</p> <p>5.1. Adjust REFIT tariff schedule subject to a set fixed price cap, 3 year review to see the impact on the utility and determine whether the REFIT tariff schedule should remain the same or be revised downwards, incorporate standardized PPA into the</p> |

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| | <p>expand renewable energy feed-in tariff (REFIT) mechanism.</p> <p>Government to prioritize funding of resource mapping, pre-feasibility studies, upstream exploration, and piloting to gain a clearer picture of the extent to which domestic hydropower, peat, solar and wind resources can generate electricity on commercially viable and competitive terms.</p> <p>(P), (E), (R), (I)</p> | <p>regulation, and add more clean energy resource types to be covered beyond hydropower such as grid-connected solar, biogas and landfill gas under an “avoided cost approach.</p> <p>5.2. Relevant technology standards to be developed by RSB. REMA to develop relevant environmental guidelines. REMA, RURA, and NICA, as appropriate to enforce compliance.</p> <p>5.3. Review investment procedures relevant to the energy sector, including the investment code and modalities of engagement.</p> <p>Peat</p> <p>5.4. MININFRA to undertake peat energy strategy and action plan including socio-economic impact assessment to ascertain optimal use for: power generation, direct industrial heat steam applications, or use as domestic charcoal substitute</p> <p>5.5. REG to undertake detailed national resource assessment (inventory) of existing bogs.</p> <p>Methane</p> <p>5.6. Consider splitting extraction and power generation components in IPP procurement.</p> |
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| | | <p>5.7. Prioritize technologies that allow for maximum sustainable extraction subject to value for money.</p> <p>Geothermal energy</p> <p>5.8. Upgrade existing legal and regulatory framework to unique needs of geothermal energy activities</p> <p>5.9. Government to de-risk by exploring the prospective geothermal areas until proven resources available, including carrying out step-wise exploration and ranking of all prospects.</p> <p>5.10. Operationalize a Geothermal Development Program to act as umbrella structure for coordinating all exploration and public-led investment activities.</p> <p>5.11. Manage tendering of PPP for development of up- and downstream facilities and for commercial exploitation of proven resources. Closely coordinate mining and energy concessions between relevant ministries. Conduct a feasibility study to evaluate viable direct applications of geothermal energy beyond power.</p> |
| | <p>6. Facilitate autonomous power generation through updated policy guidelines, streamlined licensing, and regulatory reforms. (P),(R)</p> | <p>6.1. Regulatory changes to encourage uptake of dedicated power plants for industry, geared toward mining and agro-industries.</p> <p>6.2. Scope of simplified licensing regulations targeting rural electrification activities to be extended to autonomous generation.</p> |

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| | | 6.3. Research optimal systems integration of solar energy in grid and undertake planning measures to increase transmission efficiency and stability in intermittent power supply. |
| Electricity Access | | |
| <p>Main policy objective:</p> <p>Enhance access to sustainable, modern energy for all Rwandans</p> | <p>1. Introduce short and long-term institutional reforms to increase sector coordination, accountability, and delivery effectiveness.</p> | <p>1.1. Increase household access to grid electricity to 48% and off-grid electricity to 22% based on analysis by REG Ltd and MININFRA.</p> <p>1.2. Prioritize connections to productive uses: either large users or small and medium enterprises. In the short term, all major off-grid energy access and rural electrification programs implemented by the Utility on behalf of MININFRA should be consolidated under the umbrella of the EARP.</p> |
| | <p>2. Ensure 100% access to electricity in all schools, Sector offices and health centres by 2018. (P) MINEDUC, MINALOC & MINISANTE to elaborate guidelines for budgeting responsibility for operations and maintenance and ongoing electricity services. (I)</p> | <p>2.1. EARP to examine feasibility of reaching target for each remaining unelectrified institution through on- or off-grid connection, whichever more economical.</p> <p>2.2. EARP to analyze costs and benefits of expanding access to other public services (e.g., administrative, community centers).</p> |
| | <p>3. Scale up innovative partnerships to increase rural access to appropriate off-grid technology solutions. (P), (E)</p> | <p>3.1. MININFRA shall develop, pilot, and scale-up innovative PPPs for off-grid energy delivery, following new process and project cycle under PPP Policy. Government shall support programs through in-kind</p> |

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| | | <p>assistance and other measures, including provision of new investment and fiscal incentives.</p> <p>3.2. Initiate grassroots awareness-raising campaign to promote sustainable off-grid electricity solutions, collaborating with existing civil society organizations and energy associations.</p> |
| | <p>4. Fiscal reforms to inject market-based incentives targeting urban and peri-urban citizens to switch from kerosene and wood fuels to solar lighting and clean cooking technologies, such as phasing out a tax exemption on kerosene, extending a VAT exemption for LPG. (E)</p> | <p>4.1. Study the market, fiscal and socio-economic impacts of phasing out subsidies on kerosene. Determine degree to which market demand for solar-home-systems and solar-powered lamps would be benefited from such fiscal reforms.</p> <p>4.2. Incorporate social protection principles into design of any fiscal reforms.</p> |
| | <p>5. Introduce greater competition and flexibility in off-grid service provision through measures to simplify licensing and stimulate Small-scale Power Distributors (SPDs). (R)</p> | <p>5.1. Adopt and enforce new secondary regulations under the Electricity Act to simplify licensing frameworks and processes for SPDs.</p> <p>5.2. Utility to publish National Electrification Plan put in the public domain and remaining valid for at least three years. This will encourage private investment in off-grid electricity businesses.</p> |
| | <p>6. Allow cross border electrification. (P), (R)</p> | <p>6.1. Facilitate regulatory frameworks for low-voltage cross-border electrification interconnection lines and service delivery.</p> |
| Energy Efficiency and Demand-Side Management | | |
| Main policy objective: | <p>1. Adopt new laws, regulations and codes that mandate energy efficiency measures in public institutions, households, and commercial businesses.</p> | <p>1.1. MININFRA to introduce an Energy Efficiency Strategy and Law as framework to support series of new regulations by RURA.</p> |

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| <p>Constrain unbridled future energy consumption growth and support realizing Rwanda’s Green Economy vision.</p> | <p>(R)</p> | <p>1.2. Integrate promotion of energy smart building technologies into monitoring and implementation of new government asset management policy.</p> <p>1.3. Introduce energy-smart and energy-efficient technologies and practices into Rwandan building codes, including mandatory installation of solar water heaters for large water consumers (e.g., hotels, integrated developments) in parallel to extending subsidy to end-users to incentivize switching. RHA to elaborate codes. RURA to ensure enforcement. Rwanda Housing Authority to oversee training, skills development.</p> |
| | <p>2. Restructure electricity tariff methodology to incentivize efficiency (R)</p> | <p>2.1. RURA to regulate a “demand charge” tariff component along with a time-of-use based scheme.</p> |
| | <p>3. REG Ltd to establish a dedicated demand-side management/energy efficiency unit to oversee implementation of relevant programs aligned to the policy. (I)</p> | <p>3.1. Develop a staffing and business plan as part of EWSA restructuring/institutional reform.</p> <p>3.2. Develop and outsource a comprehensive behavioral change marketing campaign targeting common sense energy management among high-consumption commercial and household end-users. Translate existing RURA guidelines into educational curriculae and public awareness programs.</p> <p>3.3. Water Utility Company shall retrofit existing water pumping systems with variable speed drives to reduce energy demand load and operational costs.</p> <p>3.4. Assess viability of other incentives for LV customers on pre-paid-meters (e.g., rebates) to shift demand patterns to smooth demand load during the day.</p> |

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| | <p>4. Promote and remove barriers to the implementation of priority efficient lighting initiatives through bulk procurement, social marketing campaigns, and targeted subsidies for retrofits. (P), (E)</p> | <p>4.1. REG Ltd EE/DSM Unit to manage bulk procurement and distribution of CFLs for residential customers (based on current consumption and end-user affordability) 4.2. REG Ltd EE/DSM Unit to manage energy-efficient lighting retrofits in public institutions in collaboration with MININFRA. 4.3. Districts empowered to take responsibility for the ongoing maintenance and running costs of street lighting through regulatory reforms. Technical support to be provided by REG Ltd EE/DSM Unit to conduct cost-effective street lighting retrofitting.</p> |
| | <p>5. Develop and adopt an EAC-wide energy standards and labeling scheme for common household appliances. (R)</p> | <p>5.1. RSB to establish a working group. Align regional standards to EAC under existing regional integration processes.</p> |
| | <p>6. Encourage and incentivize regular energy audits in industry and commerce. (P), (E)</p> | <p>6.1. Major end-users, such as industries, encouraged and incentivized to carry out regular energy audits. 6.6. MININFRA to develop a strategy and business model for an energy efficiency finance facility to bankroll audits (50/50 cost split) and retrofits. Facility would be initially capitalized by MINECOFIN through a reallocation of power tariff subsidy and DP contributions. Capital would be replenished on the basis of savings achieved. It would also establish energy performance benchmarks for industry.</p> |
| | <p>7. Institutionalize “green” public procurement guidelines and strategies</p> | <p>7.1. RPPA and REMA to develop clear criteria, guidelines for integrating energy and resource</p> |

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| | focused on equipment with a high energy footprint. (P) | efficiency into existing procurement policy and processes. |
| Biomass Sector | | |
| <p>Main policy objective:</p> <p>Facilitate fuel-switching from traditional biomass energy carriers toward modern biomass energy technologies and cleaner fuel alternatives in order to reduce non-renewable fuel wood consumption and related social, health, and environmental costs.</p> | <p>1. Consolidate institutional mandates and initiate stronger involvement of local districts (I)</p> | <p>1.1. MINALOC to promote improved charcoal production and improved cook stoves.</p> <p>1.2. Local districts to take more ownership of biomass program implementation, with the support and guidance of MINALOC.</p> <p>1.3. Better coordination and monitoring of local district development plans with respect to clean cooking targets and implementation strategies.</p> |
| | <p>2. Formalize charcoal production and supply to facilitate more effective regulatory control as well as mainstreaming improved harvesting and carbonization techniques. (P), (R)</p> | <p>2.1. Efforts to increase more formalization of sector including better-organized and consolidated charcoal producer cooperatives and associations.</p> <p>2.2. Better enforcement by RNRA of current regulations, including licensing regime, to stop illegal wood harvesting at the district level.</p> <p>2.3. MININFRA and MINALOC to ramp up support for capacity development of local charcoal producers in improved harvesting and carbonization methods. Ensure the delivery of ongoing technical assistance under a “train-the-trainers” model in every district.</p> <p>2.4. Carry out supply chain analysis to ensure more reliable, affordable, sustainable product on market.</p> <p>2.5. REMA shall continue to promote agro-forestry on local shumbas to reduce fuel wood pressure.</p> |

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| | <p>3. Increase access to cleaner cooking energy carriers (e.g., biogas, LPG, green charcoal, and biomass pyrolysis stoves) by promoting technology standards, introducing fiscal reforms where appropriate, and piloting new market transformation activities.</p> <p>(E), (R)</p> | <p>3.1. Rebalance budget to address clean cooking priorities as heavily skewed toward power sub-sector.</p> <p>3.2. Strategy to identify appropriate technologies for household cooking and ICS at different income levels/geographies.</p> <p>3.3. RSB shall elaborate updated national ICS standards with the support of REMA, MININFRA, and the private sector.</p> <p>3.4. Implementation strategy shall place more emphasis on social marketing/behavioural change campaigns and awareness raising through, inter alia, public demonstrations at “Umuganda” meetings.</p> <p>3.5. Promote more market-based PPP approaches to scaling up clean cooking programs. Evaluate feasibility of piloting similar PPP models program under concession agreements that can offer turnkey modern biomass cooking solutions.</p> <p>3.6. Implement green fiscal reforms</p> <ul style="list-style-type: none"> - enhance local skills development programs - expand partnership agreements with financial institutions in order to expand credit access to households in order to facilitate fuel switching. <p>3.7. Promote LPG by:</p> <ul style="list-style-type: none"> - Continuing VAT exemption - Providing incentives to retailers to improve LPG distribution infrastructure - Undertake a social marketing campaign. |
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| | | <p>3.8. Promote green charcoal through REG Ltd targeting peat and agriculture waste.</p> <p>3.9. Support biogas utilization by:</p> <ul style="list-style-type: none"> - Restructuring approach to the NDBP. More focus on institutions vs. households. - Reforming subsidies for biogas to be more means-tested and in line with system capacity, market demand. MINALOC to ensure more consistency of concessional financing terms across local districts. - RSB to define and adopt new national technology standard for biogas digesters. |
| | <p>4. Develop a harmonized, regionally integrated market for sustainable liquid biofuels. (P)</p> | <p>4.1. MINICOM and MININFRA shall promote and harmonize policies and market opportunities for regional biofuel industry development. Explore feasibility for regional biorefineries whereby feed stocks imported into Rwanda duty free from EAC.</p> |
| Petroleum | | |
| <p>Main policy objective:</p> <p>Ensure safe, sufficient, reliable, sustainable and affordable supply of petroleum and LPG.</p> | <p>1. Enhance attractiveness of Rwanda as investment destination for upstream oil and gas exploration and development. (P), (R)</p> <p>2. Institute an effective public-private hybrid model for maintaining strategic petroleum products. Recommend MINICOM review strategic reserve requirements to balance cost/security imperatives. (P), (R)</p> | <p>1.1. Implement National Petroleum Exploration and Production Policy adopted by Cabinet in 2013</p> <p>2.1. MINICOM to consider updating reserve requirement levels to reflect current market situation.</p> <p>2.2. Introduce incentives to incentivize retailers and wholesale fuel distributors to increase investments in gas (LPG) storage facilities.</p> |

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| | <p>3. Accelerate regional cooperation and strategic infrastructure development including new refining, pipeline transportation, and railway infrastructure. (P), (E)</p> | <p>3.1. Strategic joint investment in Hoima regional refinery and target participation in other multi-national investments, including bio-diesel blending facilities.</p> <p>3.2. Develop transportation infrastructure inter-connections for faster, more reliable supplies of petroleum and LPG. Study extension of refined petroleum pipeline to Kigali.</p> |
| | <p>4. Enhance effectiveness of petroleum price stabilization mechanisms, such as introducing new price control methodologies, expanding bulk procurement, and introducing hedging requirements for large public consumers (R)</p> | <p>4.1. Conclude bulk purchasing agreements for petroleum products with Tanzania, Uganda, and Kenya.</p> <p>4.2. Encourage and incentivize private investors to undertake bulk purchasing arrangements</p> <p>4.3. Adopt, enforce appropriate fuel pricing methodology.</p> <p>4.4. Encourage or mandated large fuel consumers to enter into fuel hedging arrangements.</p> |
| | <p>5. Introduce mandatory petroleum statistics (R)</p> | <p>5.1. Adopt regulation for mandatory submission to regulator of data related to petroleum products' trade, sales, and strategic stores.</p> <p>5.2. Closely track market growth and penetration rates for LPG through surveys, etc.</p> |
| | <p>6. Determine and enforce petroleum standards to ensure even product quality (R)</p> | <p>6.1. RURA shall set and enforce standards for all downstream petroleum products.</p> |

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| | <p>7. Implement market transformation activities, including possible revision of fiscal incentives to strengthen incentivize for LPG fuel-switching, targeting urban areas. (P), (E)</p> | <p>7.1. Implement a social marketing and behavioral change campaign to increase market uptake of LPG targeting middle-class households in urban areas. 7.2. Assist local importers with storage and distribution infrastructure investment and bulk purchasing arrangements in order to reduce LPG price. 7.3. TVETs to provide training in the production and /or assembling of LPG low cost stoves to match increased demand.</p> |
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