



Act. 3.2.: DIALOGUE WITH NATIONAL STAKEHOLDERS

National Round Table Forum

“The status of Energy in Rwanda”

– Report –

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- University of Alicante, Spain (Coordinator)

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- Moi University, Kenya
- University of Rwanda, Rwanda
- Mzumbe University, Tanzania
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FOREWORD

Energy deficit and energy poverty have become a major obstacle to growth and development in Eastern Africa. One of the major energy issues is price volatility and energy security. Eastern Africa suffers from high prices in the energy market and shrinking natural energy resources. Restricted access to energy resources is hampering the East African region from sustainable development.

The strategic framework for Rwanda's energy sector is established in the Energy Sector Strategic Plan (ESSP) and the National Energy Policy (NEP), which set targets up to 2017/18. These documents recognize the essential role of electricity access in accelerating economic development, as well as improving health outcomes and standards of living for people in Rwanda. The target for electricity access is for 70% of households to have access by 2017/18, to be met through a combination of on-grid and off-grid supply. While all households will require access to modern energy sources, the levels of consumption for some are too low to justify a grid connection. Off-grid options may offer the most economical and sustainable option for poor households, particularly given the settlement structures in Rwanda. With Economic Development and Poverty Reduction Strategy Two (EDPRS II) for 2013-2018, the target is 48% (With new rural electrification strategy approved by the Cabinet in May 2016, target is reviewed from 48% to 31-35%). This means that the total number of electricity connections will be around 1,200,000, the target access to electricity being 100% by 2020. This requires advancing technology which requires an ever-expanding range of ways for households to access electricity: a solar lantern that can also charge a phone or radio; a larger solar home system that can light an entire house and power appliances such as a television; and a grid connection that can power large-scale commercial and industrial use. The Government of Rwanda has undertaken partnership with the private sector in promoting competition which will help drive down costs and improve customer choice; and in building upon the significant private sector interest in investing in renewable energy such solar systems and mini-grids.

SUCCEED Network

Launched in October 2013, the three-year project SUCCEED Network is an ACP/EduLink project (contract number FED/2013/320-274) funded by the European Commission, which aims to promote East African university campuses as "living laboratories" for sustainability and energy efficiency, in particular by establishing a sustainable campus development platform to foster collaborative learning and action for energy access and efficiency, with the idea of contributing to solve the problems described above. The project will do this via a set of activities with the objective of improving institutional, academic and cooperation building which should result in a stronger institutional background, an enriched academic offer in renewable energy and energy efficiency, and an increased attractiveness for relevant stakeholders in order to establish new cooperation schemes in the field of energy.



OBJECTIVES OF THE NATIONAL ROUND TABLE

General Objective

Despite the energy emergency in the region, support from research institutes and academia is inadequate to address this situation. However, at the policy level, various countries have stressed the importance of energy access and quality research and innovations. This Roundtable aimed to bring together top management the Rwanda National Electric Agency, the Rwanda Energy Group (REG), managers from energy industries (EARP), and researchers from Higher Education Institutions, development partners and the development partners with the objective of exchanging ideas and discuss energy issues at a national level in Rwanda.

Specific objectives of the National Round Table

- To discuss problems and issues in the field of Energy affecting National Stakeholders, with the idea of identifying where the Higher Education System could contribute with specific services/input.
- To identify the issues and gaps that need to be addressed to enable government, stakeholders and private energy developers implement successful energy programmes and projects.
- To enhance awareness of the real needs of Science, Technology and Innovation (STI) related to energy access and efficiency in Rwanda.
- To encourage dialogue and strengthen co-operation links in the energy sector at national level among academia, researchers, industries and policy makers.
- To present the Succeed Network projects and their developments.
- To discuss the expected outcomes of the Roundtable Forum.

PROGRAMME

8:30 a.m.: Registration

Time	Presentation	Speaker
9:00 a.m	Welcoming Note by the CEO REG Ltd	Eng. Jean-Bosco Mugiraneza, CEO of Rwanda Energy Group Ltd
9: 15 a.m.	Rwanda Energy Sector Overview	Eng. Jean-Bosco Mugiraneza, CEO of Rwanda Energy Group Ltd
9:45 a.m.	Electricity Access Roll out Program (EARP)	Mbanzabigwi Niyibizi, Representative of EARP and Manager of Scaling up Energy Access Project (SEAP)

10:00 a.m.: Health break



Time	Presentation	Speaker
10:00 a.m.	Energy in Private Sector	Dr. Ivan Twagirashema, CEO, Rwanda Energy Private Developers (EPD)
10:30 a.m.	UR-SUCCEED Project and Energy Efficiency at the University of Rwanda	Prof. Bonfils Safari, Technical Coordinator UR- SUCCEED Project
10:45 a.m.	Discussions	
12:30	Closing Remarks	Eng. Jean-Bosco Mugiraneza, CEO of Rwanda Energy Group Ltd

PARTICIPANTS

The National Round Table brought together several relevant stakeholders in the field of Energy in Rwanda, including:

- Jean Bosco Mugiraneza, CEO, Rwanda Energy Group Ltd
- Dr. Ivan Twagirashema, CEO, Rwanda Energy Private Developers (EPD)
- Prof. Bonfils Safari, Technical Coordinator UR-SUCCEED Project
- Mr. Karara Alex, Technical Coordinator UR-SUCCEED Project
- Representative of CEO Mobisol Rwanda Ltd
- Representative of CEO Symbion Power Lake Kivu Ltd
- Manager of Scaling up Energy Access Project (SEAP)
- Representative of Rwanda Utilities Regulation Agency (RURA)
- Representative of the African Development Bank (AfDB)
- Representative of the European Union (EU)
- Members of the UR Energy Efficiency Unit (UREEU)

WELCOMING NOTE BY THE CEO REG LTD

Following the fruitful meetings with the CEO Rwanda Energy Group (REG), Eng. Jean-Bosco Mugiraneza and the the General Manager of the a US-Rwanda Company Symbion Power Ltd, Eng. Alex Kabuto, which took place in the meeting room of the Department of Physics, School of Science, College of Science and Technology respectively on 16 and 23 November 2016, participants recommended and it was agreed that another meeting involving other national stakeholders takes place at the headquarters of REG in the forthcoming days.

The meeting started by a welcoming note from the CEO REG Ltd who thanked participants for attending the workshop. He recognised the effort done by the Coordinator of UR-SUCCEEDP Project for creating a framework of collaboration between science of the University of Rwanda, Energy Industries and Development Partners. He also



acknowledged the valuable contribution by Development Partners and the Private Sector towards the development of Rwanda Energy Sector.

ROUND TABLE

DISCUSSION POINT: 'TITLE RT1' "Towards universal energy access by 2020 in Rwanda"

Presenter: Eng. Jean-Bosco Mugiraneza, CEO of Rwanda Energy Group Ltd

Moderator: Professor Bonfils Safari

PRESENTATION

The Government of Rwanda, under its latest Economic Development and Poverty Reduction Strategy (EDPRS II 2013-2017), envisions transitioning from a developing country to a middle-income country by 2020. But Rwanda's ability to achieve this ambitious goal is constrained by challenges in the power sector. Although Rwanda is endowed with a number of natural resources, including hydro, solar, and methane gas to power, and has plans to generate 563 megawatts (MW) of electric power from these sources, it currently only has about 209 MW of installed generation capacity to serve a population of more than 11.5 million people. The majority of its existing capacity comes from hydropower (approximately 59%) and thermal generation (approximately 40%). Most of the generation projects in Rwanda are the result of public-private partnerships between the government and independent power producers.

Since 2008, power supply has grown by 360% from 45 MW to 209 MW while peak demand has grown only 133% from approximately 119 MW in 2017. Rwanda is also part of the Eastern Africa Power Pool, and has plans to import up to 30 MW from Kenya in 2017. Based on current data, Rwanda's national electrification rate has reached 31% (3% off-grid, 28% on-grid). Over seven million people still lack access to electricity. Despite high resource potential and opportunities for cross-border export, Rwanda's power sector faces significant challenges, including a constrained transmission system. The annual consumption of electricity per capita is among the lowest in Africa, with approximately half of consumers using an average of less than 20 kWh per month.

The Ministry of Infrastructure (MININFRA) leads the country's national energy policy. The strategic framework for Rwanda's energy sector is established in the Energy Sector Strategic Plan (ESSP) and the National Energy Policy (NEP), which set targets up to 2017/18. These documents recognize the essential role of electricity access in accelerating economic development, as well as improving health outcomes and standards of living for people in Rwanda.

In an effort to reach the 100% access target, MININFRA developed a Rural Electrification Strategy (RES), which was approved by Cabinet on April 27, 2016. This strategy revised the target of providing 70% access to electricity by June 2018 with on-grid connections, to a target of 22% of households gaining access to a Tier 1 energy service (as defined in the SE4ALL Multi-Tier Framework) and 48% of households gaining access to on-grid or



at least Tier 2 energy service. RES has the objective of ensuring that Rwanda's households have access to electricity through the most cost effective means by developing programmes that will facilitate both the end users to access less costly technologies and increase private sector participation in the provision of these solutions. The Government will work with the private sector in implementing this Strategy. Particular focus will be on increasing competition within private sector which will lead to reduced costs and improved choice of technologies on the market. The Government focuses on supporting private companies to have access to different mechanisms and protecting consumers through establishing standards and carrying out awareness campaigns.

DISCUSSION POINT: 'TITLE RT2' "Electricity Access Roll out Program (EARP)"

Presenter: Mbanzabigwi Niyibizi, Representative of EARP and Manager of Scaling up Energy Access Project (SEAP)

Moderator: Professor Bonfils Safari

PRESENTATION

The Government of Rwanda, in collaboration with development partners, (African Development Bank, Belgian Embassy, EU, Dutch Embassy and World Bank) launched Rwanda Electricity Access Roll out Program (EARP) in 2009 as its flagship program to realize the primary targets of the EDPRS 1 (2009-2013), EDPRS 2 (2013-2017) for the electricity access.

Before the inception of EARP, the Government of Rwanda organized a round table with the Ministry of Infrastructure, Development partners to assess and coordinate their support to the Rwanda Energy Sector in accordance with the partnership principles. In July 2008, the Government of Rwanda signed a Memorandum of Understanding (MOU) with development partners sharing the common goal of enabling Rwanda to reach the targets of the EDPRS II, the Millennium Development Goals and the targets of Vision 2020. To this end, they intended to coordinate their support to Rwanda's energy sector in accordance with the provisions of this MOU.

In March 2013, EARP produced the National Electrification Plan that guides all the activities executed under EARP. The following categories for identification of projects were classified:

- i) Major Electrification of green field areas where there was no access earlier with particular emphasis on connection to Infrastructure.
- ii) Electrification of new areas where middle voltage (MV) and Low voltage (LV) extensions may be necessary.
- iii) Addition of new consumers in the close vicinity of the existing MV network and transformer station but need extension of LV network only.

A law repealing the previous utility, the Energy, Water and Sanitation Authority, paved the way for the creation of a corporate entity which was incorporated in July 2014 with



100% government shareholding. The Rwanda Energy Group Limited and its two subsidiaries, EUCL and EDCL, was entrusted with energy development and utility service delivery, while the Water and Sanitation Corporation has the mandate to develop and operate water and sanitation infrastructure and deliver related services in the country.

Rwanda's government is working to target 100% access to electricity by 2020 by passing by a transitional period of increasing of electricity access to more than 70% by 2018 with off-grid connections rising from 2% to 22%. The implementation of the national energy policies is facing a number of challenges:

- ❖ Supply shortfalls and high supply costs: due to insufficient generation capacity, the use of rental thermal generation has led to high electricity costs. Rwanda has the highest generation tariff in the EAC of about \$0.21/kWh.
- ❖ Low electricity rate in rural area: despite impressive gains, access rates remain low at about 25% nationwide from which 24% on grid and 1% off-grid. Significant investment is required in transmission and distribution in order to maintain the high connection rates.
- ❖ Insufficient capacity of Private Sector Investments: Private Sector Investments remain low in energy sector due to limited financial capability and return on investment which is not immediate.
- ❖ Limited technical capacity for the installation, operation and maintenance of clean energy technologies such as solar and biogas, particularly in rural areas.
- ❖ Dependence on biomass fuels in Rural areas of such as charcoal in urban areas and firewood in rural areas: This use of energy is often coupled with many problems such as deforestation, land degrade, various health and social problems as well as giving raise to emissions of greenhouse gases.
- ❖ Mind-set, behavioral and cultural rigidities among the population negatively impacts on the adoption of modern renewable energy technologies.

Strategies have been put in place to overcome those challenges:

- ❖ A Least Cost Power Development Plan (LCPDP) and an Integrated Resource Plan (IRP) are being developed to ensure the sustainable development of the electricity sector.
- ❖ The implementation of Rural Electrification Strategy (RES) approved in June 2016 supplements the Rwanda Electricity Access Roll out Program (EARP) mainly in remote areas while EARP focuses on productive users.
- ❖ A 3-year programme (Scaling up Off-Grid Energy in Rwanda, or SOGER) was launched in July 2016 with the aim to provide energy access to 77,000 people in rural communities through solar and hydropower mini-grids and solar-powered irrigation. Altogether, it is expected to create 7,000 jobs, especially for women and youth (Energy4Impact, 2016).



- ❖ Off-grid options, such as solar and biogas, are the most economical and sustainable options for poor households. Supporting biomass and other modern cooking sources will also support rural households.
- ❖ On January 1, 2017 Rwanda introduced cost cutting measures for poor households by cutting the tariff for the first 15kWh consumed per month by 50%. It also reduced industrial tariffs to bring them competitive with regional rates and brought in a time-of-use tariff for industrial customers in order to shift load to off-peak periods

Up to now EARP is still implementing the Rwanda Energy Sector Strategic Plan 2013/14 - 2017/18 that requires to be updated.

DISCUSSION POINT: 'TITLE RT3' "Energy in Private Sector"

Presenter: Dr. Ivan Twagirashema, CEO, Rwanda Energy Private Developers (EPD)

Moderator: Mr. Karara Alex

PRESENTATION

Dr. Ivan Twagirashema, EPD - Chairman acknowledged the vital role played by the government in encouraging private sector to invest in renewable energy and in rural electrification. He said that the main purpose of Public Private Partnership is to join efforts in terms of electrifying as many households as possible in a short period of time as well as to collaborate easily with the government. "It is significant for private companies to merge efforts to speak with one voice; this makes the process easier for the government to coordinate with private sector efficiently." he said. He highlighted that with the successful Public Private Partnership put in place they will move faster towards attaining energy sector projections that will fasten development through industrial and agricultural sectors. He noticed that this year the government of Rwanda in partnership with private sector signed power purchase and concession agreements with different firms to enhance energy generation. These firms include: SYMBION POWER Ltd which will produce 50MW from Lake Kivu Methane gas, IGNITE to provide solar energy solutions to 250,000 households and a Turkish Firm HAKAN to operate and transfer a 80MW Peat power plant to produce electricity.

DISCUSSION POINT: 'TITLE RT4' "UR-SUCCEED Project"

Presenter: Professor Bonfils Safari

Moderator: Mr. Karara Alex

PRESENTATION

Prof. Bonfils presented the SUCCEED Project, its vision, mission and list of activities done during the last three years. He said that though the project is at its end, the University will continue its activities related to energy efficiency at campus and outside campus. He called the public and the private sector to work together with the University through a partnership framework.



DISCUSSIONS

During discussions, participants appreciated the great progress made across a number of areas in recent years: a dedicated electricity utility established (Rwanda Energy Group); reinforcement of the national electric grid and its expansion; increased urban electric access and off-grid initiatives being implemented; an attractive investment climate established and a pipeline of projects developed.

Participants recognized the importance of the Rural Electrification Strategy (2016) which came to support the Rwanda Electricity Access Roll out Program (EARP) mainly in remote areas through Scaling up Renewable Energy Program (SREP), while EARP focuses on productive users.

Despite the strategies that have been put in place by REG/EARP to overcome challenges faced in the implementation of the Rwanda Energy Sector Strategic Plan 2013/14 - 2017/18, participants recognised the need to involve the large community and enhance public participation in development energy programs and projects and their implementation. To this end some strategic areas which need to be focussed on for a sustainable development were identified:

- *Networking*: Partnership between stakeholders by creating platforms which will boost interaction of stakeholders at national level and the University.
- *Resource mobilisation*: coordination/collaboration between stakeholders and mutual assistance in resource mobilization.
- *Research and development*: Promotion of research outcomes in renewable energy and dissemination of information to stakeholders and communities.
- *Capacity building*: government and stakeholders to engage into systematic capacity building process to create a critical mass of technicians at all levels and all District and Sector levels who are capable of installing, operating, maintaining, repairing renewable energy technologies in the country.
- *Internships for students both undergraduates and Masters*: this will help students and scientists of UR engage more in energy industries through knowledge and technology transfer systems in order to develop renewable energy technologies.
- *Consultancy*: involvement of university scientists in studies related to energy is a driver for a sustainable development.
- *Promotion of alternative energy*: public sensitization and mobilization towards the use of alternative energy such as Biogas, Solar and improved cook stoves especially for households far off the national grid in all Districts. This is in-line with the country's objective of reducing biomass dependency from the current 85%, to 55% by 2017, and 50% by 2020.

CLOSING REMARK

The CEO REG Ltd thanked all the participants for their attendance and active participation. He recalled that academic institutions train engineers and conduct research to inform national energy policy and strategies; technical institutions are engaged in a continuous capacity building process of personnel required for sustainable implementation of energy projects and programmes; development partners provide



financial support to energy programmes through grants, loans and also offer technical assistance; financial institutions provide loans to Government and to private developers of energy projects; and finally, end users on the other hand are the beneficiaries of energy services. Therefore, interactions from all stakeholders are strongly needed. The key strategic areas of action identified for the way-forward constitute an informal agreement amongst the workshop participants, and they were urged to pro-actively take steps to ensure that these actions were taken forward and implemented.

WAY FORWARD

Participants in the meeting agreed that further discussions are to hold on how to go forward including engagement with Rwanda Energy Group (REG), Rwanda Energy Private Developers and donors on the way of collaborating in promoting research and innovation and finding solutions on challenging problems related to sustainability.

ANNEX

Power Point Presentations:

- “Towards universal energy access by 2020 in Rwanda”
- “The Electricity Access Roll-out Programme (EARP) ”
- “UR-SUCCEED Project”

Policy documents available:

- Electricity Law Rwanda, 2011
- Rwanda Energy Policy, March 2015
- Energy Sector Strategic Plan 2013/14 - 2017/18
- Rural Electrification Strategy, 2016

<http://www.mininfra.gov.rw/index.php?id=86>

Sustainable Energy for All Rapid Assessment and Gap Analysis, 2014

http://www.se4all.org/sites/default/files/Rwanda_RAGA_EN_Released.pdf