

REPUBLIC OF RWANDA



MINISTRY OF INFRASTRUCTURE

BACKWARD LOOKING JSR FOR FY 2022/23 REPORT

ENERGY SECTOR

October 2023

KIGALI, RWANDA

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Abbreviations	
CODs	Completion Dates
EDCL	Energy Development Corporation Limited
ESSP	Energy Sector Strategic Plan
EU	European Union
FL	Forward Looking
FY	Financial Year
GOR	Government of Rwanda
HH	Household
HPP	Hydro Power Plant
ICS	Improved Cook Stoves
JSR	Joint Sector Review
LCPDP	Least Cost Power Development Plan
LV	Low Voltage
MAED	Model for Analysis of Energy Demand
MEPS	Minimum Energy Performance Standards
MOE	Ministry of Environment
MHPP	Micro Hydropower Plant
MININFRA	Ministry of Infrastructure
MTF	Multi-Tier Framework
MV	Medium Voltage
NEP	National Electrification Plan
NST	National Strategy for Transformation
OSCs	Off grid Solar Companies
PAPs	Persons Affected by Project
PV	Photovoltaic
RBF	Result Based Financing
REG	Rwanda Energy Group
RICA	Rwanda Inspectorate, Competition and Consumer Protection Authority
RPHC	Rwanda Population and Housing Census
RSB	Rwanda Standards Board
RURA	Rwanda Utilities Regulatory Authority
TL	Transmission lines
SE4ALL	Sustainable Energy for ALL
SDGs	Sustainable Energy Goals
SHS	Solar Home System
UNEP	United Nations Environmental Programme
WB	World Bank

INTRODUCTION

The energy sector plays a pivotal role in Rwanda's transformative and economic development agenda. To achieve these objectives, Rwanda has established targets within the National Sector Transformational Strategy (NST1) and the sector's strategic plan. These targets are also aligned with the long-term goals outlined in the National Determined Contributions (NDCs) and Sustainable Development Goals (SDGs).

The connection between the energy sector and various other sectors of the economy, including manufacturing, construction, mining and quarrying, agro-processing, transport, and tourism, presents both challenges and opportunities for Rwanda. Nonetheless, significant progress has been made to ensure that Rwandans have access to modern, sustainable, and affordable energy services. This is considered an integral part of the country's economic development, poverty eradication, and socioeconomic transformation efforts.

Rwanda recognizes that the absence of modern and affordable energy services can hinder income-generating activities and impede the provision of essential services like healthcare and education. These services are crucial catalysts for achieving economic development goals.

This Backward-looking energy joint sector review report highlights the key achievements realized in the Fiscal Year 2022/23 against national targets stipulated in various strategic documents such as Vision 2050, NST1, ESSP, and in alignment with NDCs and SDG Targets. The report also provides an in-depth analysis of success factors and implementation challenges in the implementation of NST1/SSPs. The report identifies areas where progress has been slower and outlines strategies to bridge the gaps and enhance performance.

2022/23 Backward Looking Review sections and main objectives:

Section 1: Reflection on current progress against 2022/23 targets, NST1, SSP and SDGs

- i. To assess progress in achieving sector objectives with focus on 2022/23 targets for: NST1 indicators (Annex 1.1), selected sector performance indicators (Annex 1.2), and their corresponding policy actions. This will include discussion on catch-up plans in relation to the overall NST/SSP 2023/24 targets and interventions to fast-track implementation of likely unfinished business in NST1 considering available resources.
- ii. To present and discuss budget execution performance (Annex.2.1) and (Annex.2.2) for FY2022/23.
- iii. To provide latest implementation status on SDGs indicators already monitored by sectors (Annex 3.1) and to highlight plans for monitoring the additional SDG indicators applicable to Rwanda and currently having clear computation methodologies, but not monitored at the moment using (Annex 3.2).

Section 2: Identification of priorities for the upcoming fiscal year (2024/25)

- iv. To highlight priority areas (maximum of five) for the 2024/25 fiscal year that will inform the planning and budgeting process for institutions in the sector with focus on likely unfinished business in NST1/SSPs.

Section 3: Reflection on the lessons learned from NST1 and SSP implementation to inform the elaboration of the next generation strategies

- v. To identify lessons learned and priorities (current and emerging) to inform the elaboration of the next generation of NST and SSPs

Section 4: Review of progress of previous JSR recommendations

- vi. To review progress against the implementation of recommendations from the last JSR meetings
- vii. Summary of discussions on implementation of 2021/2022 Office of the Auditor General (OAG) recommendations.

Methodology

Different sector stakeholder reports have been reviewed and used in the preparation of this backward-looking joint sector review report. In this case most of the stakeholders were engaged through technical working groups and a wider sector working group meeting. Through these meetings, participants provided inputs which were incorporated into one final report based on the terms of reference provided by the Ministry of Finance and Economic Planning.

Section 1: Reflection on current progress against 2022/23 targets, NST1, SSP and SDGs

1.1 Sector Performance against NST1 indicators

The two key energy sector indicators under NST1 include: Increased access to electricity and reduced biomass usage for cooking. The Government target is to provide universal access to electricity by 2024 and reduce biomass usage in cooking from 83% to 42% respectively.

During the fiscal year 2022/2023, 76,688 new Households and 414 Productive users were connected to the National electricity grid, which brought the cumulative total of 1,809,963 HHs. In addition to this, a total of 182,380 households were connected to off-grid electricity, which brought the cumulative total of 618,221 HHs. The total number of households connected to electricity equals to 2,427,500, standing at 71.9%, including on-grid 53.6% and off-grid 18.3% as of June 2023.

During the same period over 1,300,000 improved cookstoves were distributed. However, the sector performance in achieving this NST1 target of reducing the number of households using firewood is still a challenge as results of the 5th Rwanda Population and Housing Census (PHC) indicate 76.1% still depend on firewood for cooking while the targeted percentage is 42%.

1.2. Sector Performance against Sector Strategic Plan

1.2.1 Electricity Generation

A. Installed Capacity

The Government of Rwanda's target is to generate enough electricity to meet demand and maintain at least 15% reserve margin by 2024. Various generation projects are under development to achieve this target. The total installed capacity increased from 276.07 MW (June 2022) to 353.40 MW (June 2023). The additional capacity is a result of the commissioning of Hakan Peat to Power Plant where its installed capacity increased from 35MW to 70MW, Kavumu Mwanze 0.334MW, Ntaruka A 2MW and 40MW additional imports.

The planned target for FY 2022/23 was to increase the generation installed capacity from 276.07MW to 369.8MW. As indicated above, by end June 2023 the installed capacity had reached 353.4MW, the failure to achieve the 2022/23 target was due to delayed commissioning of Rusumo Hydro power plant (26.6MW) and Shema Power Lake Kivu methane gas plant (56MW).

B. Generation Capacity

Table 1: Installed Capacity by Source as of June 2023

Types	Installed Capacity (MW)	Percentage
Hydropower	109.662	31.03%
Import	46.1	13.04%
Methane Gas	29.79	8.43%
Peat Fired PP	85	24.05%
Shared	12	3.40%
Solar Power	12.05	3.41%
Thermal Power	58.8	16.64%
Total	353.402	100%

As indicated in the table above, Hydropower and peat fired power plants continue to dominate with the highest shares of the installed generation capacity of 109.662 MW equivalent to 31.03%, while shared and solar power contributes the least 3.40% and 3.41%. The renewable energy share of the installed capacity is 50.88% against 55.7% planned in the updated Least Cost Power Development Plan (2022-2040) and the plan is to achieve at least 60% by 2030.

C. Generation Share of different resources in GWh

The total energy generated increased from 1069.58GWh to 1199.33GWh with hydropower contributing the most followed by methane, peat and thermal. The renewable energy shares in the generation mix contributed 52.12%. The contribution of Peat increased significantly due to Hakan power plant 2nd unit and Methane also increased because Shema Power plant.

Table 2: Summary of energy mix during FY 2022/23

Details	Hydro	Methane	Thermal	Solar	Peat	Import	Share	Total
2021-2022	461.52	218.60	194.51	17.53	80.90	31.98	64.56	1,069.58
2022-2023	494.02	225.04	174.43	17.83	174.85	37.84	75.32	1,199.33
Contribution to energy Mix (%)	41.19	18.76	14.54	1.49	14.58	3.16	6.28	

1.2.2 Progress on other key ongoing generation projects by end June 2023

- ◆ 80MW Rusumo hydro Power Plant (26.6 MW Rwanda share) construction progress reached 98.7% end of June 2023 and is currently at the final stage of commissioning. The plant is expected to begin dispatching electricity this month of October with the first unit of 27MW which will be shared among three countries.
- ◆ 56 MW Shema Power Lake Kivu Methane gas power plant construction was estimated at 98% by end June 2023. Testing and commissioning is ongoing and is ready to generate power up to 37.5MW on demand as a pre-COD operation.
- ◆ 206 MW Rusizi III hydro power plant; The feasibility studies were approved subject to incorporation of comments from contracting states. Currently, mobilisation of funds and EPC firm is ongoing.
- ◆ 43.5MW Nyabarongo hydro power plant; Expropriation was completed by June 2023. On the other hand, Overall Detailed Design is at 73% while in June 2022 this was on 30%. Overall work progress stands at 19.8% from 4% report last year.

1.2.3 Other key generation activities implemented:

The least cost power development plan was revised and updated in June 2023 and key updates therein are realignment of CODs of power plants, updated demand assumptions/inputs considering the 5th RPHC and MAED Demand Analysis, integration generation resource assessment and Solar PV systems integrating storage.

1.3 Access to electricity

1.3.1 Grid Electricity Access

During the FY 2022/2023, 76,688 new customers were connected to the national grid against the planned 200,000 connections (2022/23 targets). The new connections include 414 productive use areas including; health facilities, schools, early child hood development centers, mines, coffee washing stations, industries/factories among others. This brings the total number of connections to the grid from 1,740,316 reported mid- August 2022 (5th RPHC Thematic Report) to 1,809,963 connections as of end June 2023 equivalent to 53.6% of the total connections.

The underperformance was largely attributed to the fact that, there was shortage of materials on the international market, poor performance of contractors and delayed procurement most especially the electrification projects in the Eastern Province.

According to the Energy Sector Strategic Plan (2018-2024), the target for grid connection is planned to be 52% of the connections by end June 2024. From end June 2023 results indicate that the target for grid connections has been achieved.

1.3.2 Off grid Electricity Access

Off-grid connections increased by 182,380 households against the planned 80,000 connections bringing the total connections through off grid to 618,221 households equivalent to 18.3% by end June 2023 from 460,559 households¹. This increment is attributed to the contribution of the subsidy program under the Renewable Energy Fund that addressed the affordability issue especially among low-income household.

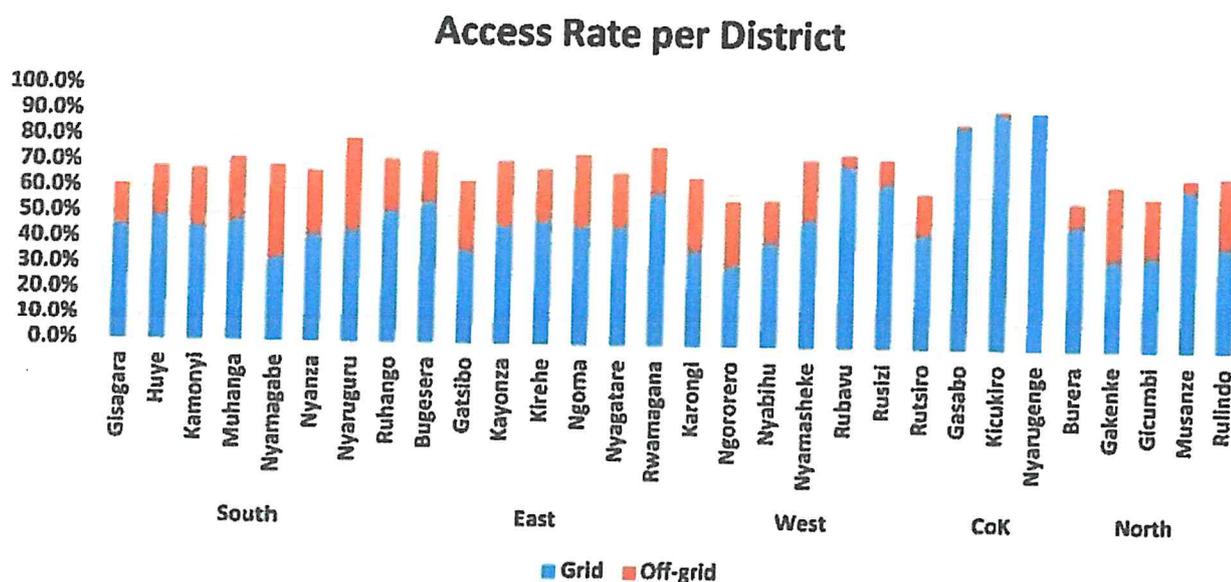
According to the ESSP (2018-2024), the target for grid connection is planned to be 48% of the connections by end June 2024. By end September 2023, the off-grid connection rate stood at 20%. Although there has been commendable performance in this subsector in the recent years, it faced several challenges during the starting period of ESSP (2017-2020) which included; affordability issues, COVID-19 and minimal investment in mini-grid systems.

¹ 5th RPHC Thematic Report

1.3.3 Productive use

By the end of June 2023, 414 productive users were connected to the grid against the planned 500. The cumulative number of productive users connected to electricity reached 8,828. The annual connections include 35 local administrative offices (Sector, Cells, villages, and other government facilities), 33 water facilities, 58 health facilities, 162 schools and the remaining include hotels, markets and factories.

Figure 1: Access Rate per District



Source: REG Annual Report 2022/23

In general, by end June 2023, the electricity access rate countrywide had increased to 71.9% from 66.7%² bringing the total number of connections to 2,427,500 households. The Government has committed to meet universal access to electricity, with an estimated 3.7 million households to be connected by the year 2024. To achieve this ambitious target, concerted efforts will be targeted towards electrifying districts which are lagging behind. In addition, due to resource constraints for grid connections, standalone solar systems and mini grids will be deployed as a temporary solution in some areas demarcated as grid areas as per national electrification plan.

² 5th RPHC – Thematic Report

1.4 Electricity Transmission and Distribution

By the end of June 2023, the total length of the transmission network, including 220kV and 110kV lines, was recorded at 1,158.00 km from 973.14 km across the country. During the report period 184.86 Km were commissioned against the planned target of 187.3Km. This was as a result of commissioning; 62.84 km of 220kV Rwanda-Burundi TL, 117.60 km of Rusumo - Bugesera-Shango TL and 4.42Km line evacuating Shema Plant connecting to Rwanda-DRC Interconnection line.

1.4.1 Key on going Transmission lines

❖ **Bwishyura-Kigoma-Rwabusoro transmission network:**

The 79.96 Km project will evacuate methane gas power from Shema Kivu Lake Power Plant to the existing high voltage transmission line (220kV Rwanda- DRC) and linking the existing substations of Bwishyura and Rwabusoro via Kigoma Substation. The project scope includes:

- (1) Construction of 4.42 Km line linking Shema Power Plant to the existing Rwanda-DRC line - completed;
- (2) Construction of 11/110 kV SPLK Substation - completed;
- (3) Construction of GIS Substation - completed;
- (4) Construction of 75.55 Km of 220 kV transmission line Bwishyura-Kigoma-Rwabusoro and Extension of Kigoma substation - estimated at 5% representing site assessment and topographic survey.

❖ **Bwishyura, Rubavu and Kibuye Substations**

These substations are part of 220kV Regional Interconnection Lines between Rwanda and DRC in addition to Birembo and Shango are already completed. The overall project progress is at 46%. Civil works, designs, electromechanical and procurement are at advanced stage for both Rubavu and Bwishyura substations. Site mobilization for the Kibuye substation is at an advanced stage.

Planned transmission projects under different stages of procurement:

- Bugesera Industrial Park substation (3*30 MVA) & 110kV TL Bugesera industrial park to Bugesera international airport substation
- 110kV Rwinkwavu-Kirehe TL and associated substations
- 110kV Rukarara-Huye-Gisagara TL and associated substations
- 110kV Gabiro – Nyagatare TL and associated substations
- 110kV D/C Rulindo – Gicumbi TL (cut in -cut out) and associated substations
- 110kV Nyabarongo I-Nyabihu line and substations extension of Nyabarongo and Nyabihu constructed

- 110kV Rwabusoro-Bugesera Industrial Park (IP) and extension of Rwabusoro/Bugesera IP substations constructed
- 110kV Nyabihu-Rubavu and extension of Nyabihu/Rubavu substations constructed
- 220kV Mamba-Gisagara and extension of Mamba/Gisagara substations constructed
- 110kV Bugesera-Gasogi and extension of Gasogi/Bugesera substations constructed

1.4.2 Key updated plans in Transmission

The transmission network development plan was revised and updated, and the key updates incorporated are the following:

- The total length of Existing Transmission Lines has been changed from 973.13km to 1,159.75 km.
- The operational timeline for some projects is changed according to LCDP.
- Shango SS has been completed including the 220kV Transformer and line bays.
- The 110kV Bugesera-Gasogi has been replaced by 220kV Kigoma-Rwabusoro i.e this project is now under projects with funds.
- Masaka substation is introduced in this version.
- Upgrade of Birembo SS
- Improving Substations System Automation and Security (To be remotely operable, have CCTV cameras, have fingerprint system, have ACs in Control Rooms, Public Lighting, Lightning arrestors for control Rooms, addition of Synchro check)

1.4.3 Distribution

During the financial year 2022/23, the distribution network expanded, by adding 257.88 Km of medium voltage (MV) lines and 260.7 Km of low voltage (LV) lines. This increased the total MV lines to 10,777.98Km and LV lines to 18,726.4Km bringing the total distribution network length to 29,504.38 Km, up from 28,985.8 Km recorded the previous year.

1.5 Street lighting

In line with Government's target of having streetlights along all national and main roads by 2024, EDCL committed to install streetlights with additional 631.85Km to the existing ones. Therefore, that initial scope was amended to include new priority sections and to rehabilitate/replace some existing section which brought the total length to 731.98 Km. So far, 650.74Km of streetlight have been constructed and energized. The overall project progress as of June 2023 was at 98.96% against the planned 100% from 65.6% recorded in June 2022. Key projects energized include; 33.5Km of Kigali-Kayonza; 65.7 Km of Kigali - Gatuna; 37.4Km of Huye - Kitabi; 52.6 Km of Kigali city replacement of luminaries; 86.6 Km of Kabgayi-Huye-Akanyaru;

51.2 Km of Base-Rukomo; 95.29 Km of Muhanga - Ngororero- Mukamira; 33 Km of Rubengera - Gisiza - Pfunda; 27 Km of Rusizi-Ruhwa; 89 Km of Rusizi-Karongi.

1.6 Sustainable use of Biomass and Other Clean Cooking Energy solutions

The Government of Rwanda plans to reduce dependency on biomass/traditional cooking technologies from 83.3% to 42% by 2024 (ESSP), the recent census indicated that an estimated 5% of total households use clean cooking technologies (LPG, Electricity and Biogas) and 38% of total households using improved cook stoves. Consequently, the Sector continues to carry out awareness campaigns on the use of alternative cooking technologies and dissemination of Improved Cook Stoves (ICS).

a) Dissemination of improved cooking stoves.

From July 2022 to June 2023, 833,611 Improved Cook Stoves were distributed through various initiatives against the planned 128,010 ICS, in the same regard, Implementation of the result-based finance clean cooking program has continued in partnership with BRD and EDCL funded by the world Bank. The project is targeting to provide over 500,000 households with clean cooking stoves by 2024. By September 2023, over 180,000HHs had benefited from this project. The Government in partnership with private sector has continued to conduct awareness campaigns across the country through electronic and print media to promote use of clean cooking solutions.

b) Implementation of clean cooking in institutions;

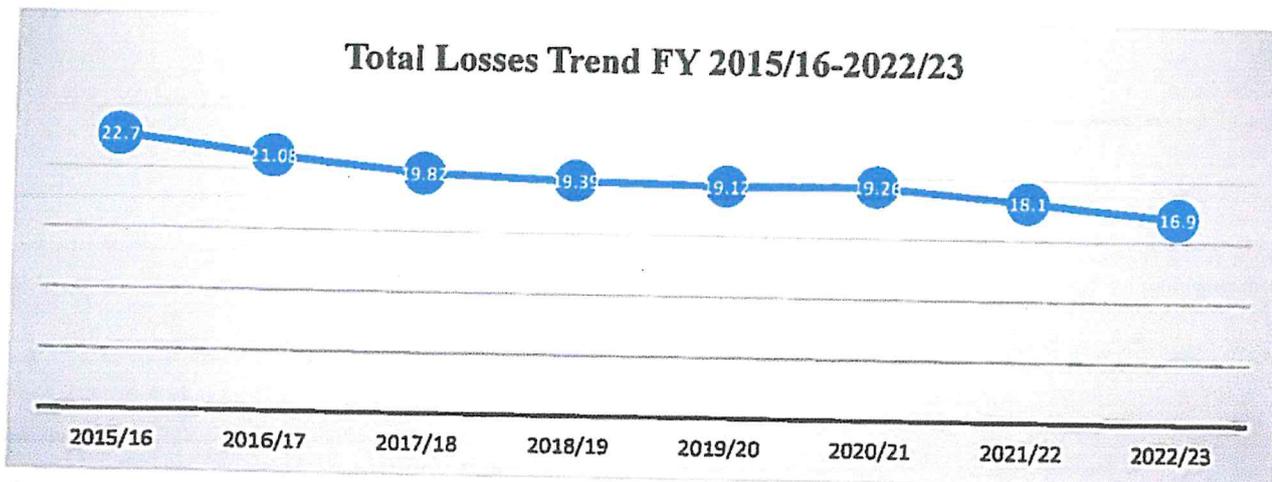
In the last fiscal year, 284 schools were planned to be provided with Improved cook stoves under a project funded by European Union Delegation and by end June 2023, ICS had been installed in all 284 schools. In addition, the Government has also secured funding from Danish government to support more schools to acquire clean cooking equipment and the project is expected to start this FY 2023/24.

1.7 Energy efficiency and increase security of supply

1.7.1 Electricity Loss Reduction and network performance

The average total power losses on the National Grid for this FY 2022/2023 were 16.9% against the planned 17%. Compared to 2021/22 performance the total losses reduced by 1.2% from 18.1% recorded in June 2022. The total losses are composed of 13.59% technical and 3.31% non-technical.

Figure 2: Trend of Total Energy Losses



Source: REG Annual report 2022/2023

During the FY 2022/2023, the entire country distribution network performance was as follow: The System Average Interruption Duration Index (SAIDI) reduced to 14.42 from 18.59 of the previous year and the average number of interruptions that a customer experienced, System Average Interruption Frequency Index (SAIFI) reduced to 21.71 from 45.67 of the previous year.

Table 3: Network Performance

DESCRIPTION	UNITS	BASELINE (July 21- June 22)	Target 2022/2023	Achieved July 22 - June 23
SAIDI	Hours / Year	18.59	17.7	14.42
SAIFI	Times / Year	45.67	36	21.71

Source: EUCL Annual Report 2022/23

1.7.2 Key network improvement projects

Completed:

- ❖ Improvement of Substations and Distribution network (JICA-III, Upgrade of Gasogi SS): overall progress was estimated at 100% by end June 2023. The project has been completed both substation and 20km of distribution lines.
- ❖ Upgrade of Eastern Province network from single phase to three phase: Completed with 182Km distribution next and 124 transformers upgraded

Ongoing:

- ❖ SCADA/Distribution Management System (DMS): Progress is at 29%
- ❖ Upgrade of Nyabarongo 110/30kV 20MVA Substation and associated feeders: Progress at 88%
- ❖ Upgrade of 1.6 MVA to 10 MVA Kirinda transformer: Progress 98%

1.8 Petroleum storage Reserves

The Petroleum strategic reserves stand at 118 million liters of oil storage capacity against 198 million liters targeted in 2024. Currently, works for Rehabilitation of Rwabuye Fuel Depot have been completed at 100%, testing and commissioning was completed and the depot is operational since September 2023. It is also worth noting that, in order to increase strategic stock for Liquefied Petroleum Gas (LPG), development of 17,100 m³ of storage facility in partnership with private sector is ongoing. Overall project progress is at 20% (leveling the site and construction of retaining walls). The project is behind schedule as planned due to delay in mobilizing the project financing.

1.9 Cross-cutting Areas

1.9.1 Capacity building

Capacity building for both individual and institutional development continues to be at the forefront of the energy sector. During the reporting period over 640 staff in MININFRA, REG with its subsidiaries EUCL and EDCL were trained in different disciplines. Currently, a capacity building plan for Energy sector has been approved to be funded under the Energy Access and Quality Improvement Project (EAQIP).

The Ministry of infrastructure in partnership with EU is implementing a capacity building programme to implement the functional review action plan of the energy directorate. The project is aimed at improving the capacity of the directorate to implement its mandate especially development of policy, strategy development and required studies.

1.9.2 Environment and Gender

A. Environment

The Government of Rwanda targets to reduce the number of households using tradition cooking technologies to 42%. In this regard, projects under the energy sector are being implemented to accelerate access to clean cooking solutions including; the result-based financing clean cooking project implemented by EDCL and BRD and supporting clean cooking solutions in schools funded by EU. GoR has also demarcated areas for off-grid and mini-grid connection to

electricity, there is an RBF programme in BRD with support of EDCL that provided subsidy to households in that area.

In addition, awareness campaigns have been conducted countrywide to promote use clean and efficient energy. In return, these initiatives are expected to reduce pressure on natural forests.

It is also important to note that all energy projects are required to conduct an Environmental Impact Assessment before implementation.

B. Gender

Promoting gender equality is a fundamental pillar of Vision 2050, an ambitious plan for Rwanda to achieve upper-middle-income status by 2035 and high-income status by 2050. This vision prioritizes the goal of achieving gender equality and inclusivity through a development model that embraces principles such as gender equality, pro-poor interventions, unity, and solidarity. This approach underscores the significance of gender as a key driver for sustainable transformation and development, emphasizing its role as an empowering factor in the pursuit of these economic goals.

Every year, the Ministry of Infrastructure develops the infrastructure Gender budget statement, this includes energy activities that are geared towards gender promotion especially in terms of energy services.

During financial year 2022-23 the call for proposal for Endorsing a Women in Science Research and Innovation Grant application for the project, titled: "Design, Fabrication and Testing of Solar Powered Induction Cooker" is ongoing.

1.10 BUDGET EXECUTION FOR THE FISCAL YEAR 2022/2023

The budget allocated to the energy sector totaled to 232 Bn(frw). During the last financial year, the development budget constituted 92% while recurrent expenditure accounted for 8% of the total budget. In addition, domestic resources accounted for 33.5% while 66.5% accounted for resources from external funding including both grant and loans.

By the end of June 2023, a total of 174.14Bn (Frw) equivalent to 75% of the allocated budget had been committed. As indicated in the table 4 below, domestic finance performed better than external finance. This was mainly due to delays in execution of projects financed externally as a result of lengthy approval processes during the procurement which resulted into poor performance of grid electrification projects and thus affecting the achievement of the corresponding annual connection targets.

Table 4: Budget Execution

No	Program/Sub Program	2022/23 Revised budget (Billion Frw)	Budget execution (Billion Frw)	% Execution
Recurrent				
1	Administrative And Support Services	17.28	16.82	97%
Development (Domestic)				
1	Electricity Generation	5.88	5.88	100%
2	Electricity Transmission and Distribution	39.32	39.32	100%
3	Energy Efficiency and Supply Security	13.74	13.74	100%
Total GoR		77.85	77.4	99%
Development (External)				
1	Grants	51.19	51.19	100%
2	Loans	104.81	47.19	45%
Total External Funds		156.00	98.38	63%
Grand Total		232.21	174.14	75%

1.11 IMPLEMENTATION STATUS OF SDG 7

The Sustainable Development Goal 7(SDG7) aims at ensuring access to affordable, reliable, sustainable and modern energy for all by the year 2030. The table 5 below indicates progress on implementation of indicators currently monitored by Rwanda under Goal 7.

Table 5: Implementation Status of SDG 7

SDG 7	Indicators	Baseline value		Progress value	Progress year	Data Source
Goal 7. Ensure access to affordable, reliable, sustainable and modern energy for all						
7.1.1	Proportion of population with access to electricity	27%	2016-17	71.9%	June 2023	Admin Report (MININFRA)
7.1.2	Proportion of population with primary reliance on clean fuels and technology	1.2%	2016-17	5.3%	2022/23	5 th RPHC/NISR
7.2.1	Renewable energy share in the total final energy consumption	53%	2016-17	50.88% (Proxy indicator)	2022/23	Admin Report (MININFRA)

Additionally, there are plans to monitor indicator 7.3.1 which is Energy intensity measured in terms of primary energy and GDP (megajoules/USD), the Ministry of Infrastructure in partnership with the International Energy Agency is implementing a capacity building exercise to train technical staff on Energy Balance data required to measure Primary Energy.

Section 2: Identification of priorities for the upcoming fiscal year (2024/25)

The key priority areas to be considered during planning and budgeting for the 2024/25 Fiscal Year will be:

- I. Scale up electricity access through both grid and off grid focusing mainly on districts with low access rates. There are ongoing electrification projects in the 3 districts with low rates i.e Ngororero, Nyabihu and Burera with an average progress of 20% and there are also similar projects across the 4 provinces at different stages of procurement and implementation.
- II. Implementation of on-going generation projects: Committed generation projects using hydropower, methane and other sources will be monitored for timely implementation
- III. Promote the use of clean cooking solutions to ensure households transit from using traditional to cleaner cooking technologies through implementation clean cooking result-based financing project and other initiatives
- IV. National grid network strengthening and expansion: The government will also focus on network upgrade initiatives, transmission system expansion and protection to reduce losses.
- V. Street Lighting: Continue with the installation of streetlights on the existing major national and urban roads.

Section 3: Reflection on the lessons learned from NST1 and SSP implementation to inform the elaboration of the next generation strategies

The energy sector has continued to record positive progress in terms of achieving sector targets as per NST1 and ESSP. This section will discuss in detail the achievement, the challenges encountered, lessons learnt, catch up plans to strategize on how to fast track in order to meet their targets before 2024.

1. Generation:

- a) The ESSP target was to generate enough capacity to ensure that all demand is met and a 15% reserve margin is maintained. The generation capacity increased from 218MW (2018) to 353MW (2023), this means that the current generation capacity is able to meet the current demand, however, given the number of generation projects in pipeline it will be necessary to work with different stakeholders in order to stimulate demand.

b) The Government of Rwanda continued to attract Private sector investment in the development of power generation projects which increased the availability of power however, some of these investments were acquired at high cost leading to a high-end user tariff and the need for Government subsidy. However, this is not a sustainable solution, the GoR is exploring ways to engage IPPs to restructure the expensive PPAs. Additionally, there is need for Government investment in future generation projects prioritizing a mix from cheaper power sources which will at the end dilute the existing agreements, thus leading to cost effective tariff.

2. Access:

There has been a considerable achievement in access from 32.7% in 2017 to 71.9% in 2023. This is attributed to considerable investment in electrification by the Government with support from different development partners, involvement of private sector in off-grid electrification, a favorable grid connection policy for low-income households, access financing for off-grid solar systems through the establishment of Renewable Energy Fund and subsidies to ease affordability of SHS especially to low-income households.

- ❖ The National Electrification Plan was developed and it is revised periodically to facilitate least cost planning of electrification projects by demarcating areas for grid and off-grid solutions.
- ❖ Although much has been accomplished, there are challenges which have delayed the achievement of different electricity access targets including; overdependence on international companies, procurement processes taking long especially on externally funded projects and shortage of materials on international market. The solution to the aforementioned challenges would be; development of local capacities, encourage investment in the manufacturing industries of electricity related materials, engage development partners on shortening the procurement processes.

3. Clean cooking:

This indicator is still behind however the Government of Rwanda has plans to reduce dependency on biomass/traditional cooking technologies from 83.3% to 42% by 2024 (NST1). Consequently, there has been significant increase in the usage of LPG especially in urban areas from 1% in 2017³ to 5% in 2023⁴. In addition, 1,352,972 ICS have been disseminated in partnership with private sector and other stakeholders.

³ EICV 5

⁴ 5th RPHC NISR Data

The Ministry also developed the Biomass Energy Strategy 2018/19 as well as Ministerial Guidelines on clean cooking to streamline implementation of clean cooking programmes with Government and different partners.

More efforts have been deployed to facilitate households and public schools to access clean cooking systems including Result based financing project targeting 500,000 households, ENI project targeting 500,000 households in Eastern Province and 284 public schools who have been provided with improved clean cooking systems.

Despite the above initiatives, there are significant challenges such as inadequate sector coordination with other sectors/institutions; inadequate penetration of clean cooking technologies, availability of real time clean cooking data to monitor progress of the subsector, affordability of ICS, availability of fuels, inadequate capacity of local companies to produce ICS and Fuel on mass scale and competition of carbon trading versus RBF affecting companies to participate in RBF programme.

There are ongoing initiatives to address the above challenges including, Government intervention in partnership with World Bank under the RBF Clean cooking project aimed at addressing the issue of affordability, improving the capacity of local manufacturers of clean cooking solutions as well as investment in exploration of methane gas for household and industrial use. More efforts are still needed to encourage local manufacturing of more efficient clean cooking solutions like accessories of LPG and Electrical cookers which are currently imported.

4. Insufficient Petroleum and LPG strategic storage reserves:

Rwanda being a net importer of petroleum products, it continues to face price fluctuation challenges due to changes in price on the world market. Thus, the lack of enough storage facilities exposes the country to these price fluctuation risks. The Government of Rwanda (GoR) target is to have 198 Million litres of oil strategic reserves capacity by 2024. Currently, there is 117 Million litres capacity and the gap to reach the 2024 target is 81 Million litres. In addition, GoR has partnered with the private sector to initiate the construction of a 17,100m³ facility for LPG storage. Furthermore, the Government is actively promoting and encouraging other private operators to consider building additional storage facilities for Petroleum products and LPG.

5. Emergency funds to support the sector in unplanned circumstances; During the implementation of NST1, the infrastructure sector specifically the Energy sector was hit hard by Covid 19 consequences where many activities were halted and flooding which affected mainly parts of Northern and Western province damaging electricity lines, substation and some power plants. With the aforementioned challenges, the Government

of Rwanda mobilized financing to repair the damaged infrastructure in order to ensure energy services delivery.

6. **Climate resilient infrastructure:** Energy infrastructures are capital intensive investment to develop, over the NST period strides have been made in developing these infrastructures which include; powerplants, substations, transmission and distribution networks. Though the component of environment impact assessment is always under scored during the development, it has observed that there is need to strengthen this assessment in order to incorporate climate resilient measures.

7. **Deep assessment of feasibility studies:** Over the 7 years, the energy sector has experienced delays in implementation of different projects resulting from inadequate assessment of the feasibility studies. There is need to build local capacity for technical teams that review feasibility studies.

Section 4: Review of progress of previous JSR recommendations

Implementation of Previous JSR Recommendations

In July 2023, the Ministry of Infrastructure organized the energy sector working group meeting that discussed the report for FY 2023/24 Forward Looking Joint Sector Review report. The meeting recommended that;

SN	Recommendation	Implementation Status
1.	To allocate more villages under National Electrification Plan for off-grid solar systems.	REG has allocated 2000 villages for off-grid and one Private Sector has covered all and EDCL will allocate more.
2.	To convene a meeting with OSC companies and discuss pending challenges.	A meeting with Off-grid Solar Companies was convened and different challenges were discussed including subsidy level review.
3.	To use other unconventional methods for financing low performing districts.	<ul style="list-style-type: none"> • Pre-financing has been considered to be used in some districts. • Low performing districts have been prioritized under the new financing from the WB and AIIB – ASCENT Programme.

4.	To discuss with different partners and stakeholders to ensure funding mobilisation for the electricity access gap estimated to be USD 600 M.	400M USD has been mobilized from WB and AIIB.
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Implementation of 2021/22 OAG Recommendations

Below is the summary of implementation status on OAG recommendation for REG, EUCL, EDCL and 4 projects implemented under EDCL. EDCL projects have a bigger share audit queries due to delayed implementation though it is important to note that only one query remains unimplemented. Above 80% of the queries have been either implemented or in progress as per the table below.

Table 4: Implementation Status of Auditor General's resolutions for FY 21/22

SN.	REG		EUCL		EDCL		EDCL Projects (4 projects)	
	Number	%	Number	%	Number	%	Number	%
Implemented	4	80%	25	83%	19	57%	38	69%
In Progress	0	0%	4	13%	12	37%	16	29%
Not implemented yet	1	20%	1	4%	2	6%	1	2%
TOTAL	5		30		33		55	

Source: REG Audit reports

Signed

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for
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