



# SUSTAINABLE ENERGY DEVELOPMENT PROGRAMME

## Semi-Annual Budget Monitoring Report

Financial Year 2023/24

March 2024

Budget Monitoring and Accountability Unit  
Ministry of Finance, Planning and Economic Development  
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## ABBREVIATIONS AND ACRONYMS

AFD	Agence Française de Development
AfDB	African Development Bank
CDAP	Community Development Action Plan
CGV	Chief Government Valuer
EIA	Environmental Impact Assessment
EPC	Engineering, Procurement and Construction
ERT	Energy for Rural Transformation
EXIM	Export-Import Bank
FAT	Factory Acceptance Test
GERP	Grid Extension and Reinforcement Project
GoU	Government of Uganda
HPP	Hydro Power Project
HSE	Health Safety and Environment
HV	High Voltage
IDA	International Development Association
IFMS	Integrated Financial Management System
IPC	Interim Payment Certificate
JICA	Japan International Cooperation Agency
KfW	Kreditanstalt für Wiederaufbau
KIL	Kilembe Investment Limited
KIS	Kalangala Infrastructure Services limited
KRECS	Kyegegwa Rural Electricity Cooperative Society Limited
kV	kilo Volts
LPG	Liquefied Petroleum Gas
LV	Low Voltage
MDAs	Ministries, Departments and Agencies
MEMD	Ministry of Energy and Mineral Development
MEPS	Minimum Energy Performance Standard
MLHUD	Ministry of Lands, Housing and Urban Development
MoU	Memoranda of Understanding
MPS	Ministerial Policy Statement
MV	Medium Voltage
MW	Mega Watts
NDP III	Third National Development Plan
OE	Owner's Engineer
PAPs	Project Affected Persons
PBS	Programme Budgeting System
PDHs	Physically Displaced Households
PIP	Public Investment Plan
PPDA	Public Procurement and Disposal of Assets Authority
PPP	Public-Private Partnership
RAP	Resettlement Action Plan
REP	Rural Electrification Programme
RoW	Right of Way
SDR	Special Drawing Rights



TX	Transformer
UEDCL	Uganda Electricity Distribution Company Limited
UEGCL	Uganda Electricity Generation Company Limited
UETCL	Uganda Electricity Transmission Company Limited
UREAP	Uganda Rural Electrification Access Project



## FOREWORD

At the start of this Financial Year 2023/24, the Government of Uganda outlined strategies to accelerate the country's economic growth agenda. Some of these strategies centered on enhanced domestic revenue mobilization and collection, and effective implementation of various initiatives to improve the efficiency and effectiveness of government programs and projects.

Within your programmes, I urge you to undertake a comprehensive reflective exercise to find out if indeed the interventions being implemented are achieving the true essence of efficiency and effectiveness. If not, why? How can this situation be remedied? Without efficiency and effectiveness, the impact and the ensuing sustainability from the interventions will not be achieved, thus reducing the opportunities for investment in new and more productive ventures.

The government is concerned that some programmes have stagnated at fair performance over the years, although they receive a considerable amount of their budgets annually. These monitoring findings form a very important building block upon which the programmes can begin the reflective exercise. I will be happy to hear your ideas on how the last-mile service delivery can be improved.

Ramathan Ggoobi

**Permanent Secretary/Secretary to the Treasury**



## EXECUTIVE SUMMARY

The overall semi-annual performance of the four sub-programmes (Generation, Transmission and Distribution, Renewable Energy Development, Energy Efficiency and Conservation) under the Sustainable Energy Development Programme was fair at 58.9%. The approved budget for the programme was Ug shs1,394.13 billion (bn). The budget release under the programme at half year was Ug shs 426.52bn and the expenditure was Ug shs 307.604bn. There was very poor disbursement on the externally funded projects, with only Ug shs 74.5bn (8%) of the total externally funded budget of Ug shs 922bn spent by half-year attributed to delayed works and procurement delays.

### Performance

The performance of the Generation Sub-programme was fair at 69.2%. The main planned outputs under the sub-programme included the completion of works at the Karuma Hydro Power Plant (HPP) and construction of Nyagak III. Although there were still some pending works at Karuma HPP the main works were substantially complete with the overall progress at 99.98%. Five of the six generation units (#1, #2, #3, #4 and #6) at Karuma HPP were commissioned by 31<sup>st</sup> December 2023 adding 500MW to the generation capacity. Limitations posed by the vandalized transmission infrastructure were resolved with the restoration of the 400kV Karuma-Kawanda transmission line to enable full evacuation of electricity from Karuma HPP.

Works at Nyagak III HPP progressed well during the first half of FY 2023/24, although the target to complete the project was not met. The new completion date was revised to 29<sup>th</sup> June 2024. Civil works at the powerhouse and penstock were at 95% and most of the electrotechnical installations (turbines, generators and gates) were completed.

The Transmission and Distribution Sub-programme performance was fair at 61.5% by half year FY2023/24. The main continued challenges to project implementation were Right of Way (RoW) bottlenecks, contractor cash flow challenges, and procurement delays. Several key milestones were reached with the addition of several transmission lines to the national grid. Notable among these were the completion of 83km of the Gulu-Agago Transmission Line, renovation of the vandalized 248km of the Karuma Interconnection Project, and energization of the Gulu-Kole transmission line. However, the works on other transmission projects under implementation were plagued by delays notably the Gulu-Nebbi-Arua transmission segment, the Kabale-Mirama Transmission Project. The implementation of other projects namely: The Masaka-Mbarara 400kV Transmission Project and the Kampala Metropolitan Transmission Project was still mired by procurement delays several years after the projects became effective.

Implementation of several electricity grid extension projects continued during the first half of FY2023/24. The defects liability monitoring period of Lots 1-6 and Lots 10-12 for several schemes under the Uganda Electricity Access Project (UREAP) were completed in the Eastern region (Kaliro, Iganga, Soroti, Serere), Northern region (Gulu, Nwoya, Lira, Alebtong), Southern (Butambala, Isingiro, Mbarara, Rukungiri) and Central Region (Nakaseke, Luweero, Nakasongola, Kiryandongo Wakiso) were completed. Works on Lot 7 which was intended to connect Bugala Island to the national grid via a marine cable were completed. Testing of the marine cable and commissioning of the newly constructed grid network on the island were ongoing.

Most works under Energy for Rural Transformation (ERT III) were completed, but some lines were delayed by the failure to fully acquire wayleaves in time. Overall on the project, the completed





schemes were lines 1, 2, 4, 11, 15, 18, 19 and 21. Works on lines 3 (87.7%), line 12 (89.9%), line 13 (88.9%) line 14 (71.7%) line 16 (64.4%) line 17 (83.3%) and line 20 (54.3%) were yet to be completed. Completion of these remaining works is to be undertaken using Government of Uganda (GoU) funds after the World Bank loan period expired.

Under the bridging of the demand-supply balance gap through the accelerated Rural Electrification Project, a total of 3,162km out of 3,449.1km of medium voltage, 6 598 out of 7,131.61km of low voltage, and installation of 3,041 out of 3,607 distribution transformers were completed and technically commissioned across different regions in the country.

The performance of the Renewable Energy Development Sub-programme was fair at 50% by half-year 2023/24 and the sub-programme is severely underfunded. The sub-programme has one intervention - to promote the use of new and renewable energy sources. Two solar drying systems were installed in the Busoga region and farmers were trained on the operation and maintenance of the systems. Additionally, six sites which include schools and firms were identified in Kabale, Kasese, Mbarara, Masaka and Jinja districts for installation of institutional biogas systems. Connection of the 4MW Busitema solar plant to the electricity was finally completed. However, work on the 15 solar mini-grids in Isingiro and Rakai did not progress, due to the departure of the previous developer.

The Energy Efficiency and Conservation Sub-programme performance was also fair at 55%. The planned interventions under the sub-programme - promotion of the use of energy-efficient equipment for industrial and residential consumers. During the half year, the preliminary electricity consumption data collection has been undertaken for all industrial and domestic consumers. Also, a survey was commissioned to collect data on the type of electric appliances imported into the country to enforce the Minimum Energy Performance Standards (MEPS). To promote electric mobility, a review of existing electric vehicle charging standards has been done and formulation of specifications was underway.

## Challenges

- i) Limited financial capacity of some of the contractors is becoming a persistent problem in the sector. The contractors for both Kabale-Mirama, and Kole-Nebbi-Gulu-Arua were under financial strain which was hindering the project works.
- ii) Transmission lines and rural electrification projects continue to experience delays due to land acquisition challenges. Delays on the remaining ERT III lines and work on several sections of the Mirama-Kabale and the Nebbi-Arua transmission segments are mainly attributed directly to this challenge.
- iii) Delays in the acquisition of designs of some project components further delays implementation. The root cause of this can be traced to inadequate technical investigations during the feasibility studies.

## Conclusion

Although the Sustainable Energy Development (SED) Programme takes up the largest share of the Energy Sector budget, it continues to grapple with several project implementation challenges. Most



of these challenges can be traced to delayed procurement of works, poor contract management on ongoing projects, and challenges in the acquisition of RoW for the electricity infrastructure. On a positive note, the incidents of vandalism on newly constructed electricity grid infrastructure have greatly reduced due to the vigilance of the security agencies. This has helped achieve the completion of several delayed grid extension and transmission projects. The budget allocation for funding interventions/outputs contributing to the promotion of renewable energy and energy efficiency remains very low for them to have a significant impact.

### **Recommendations**

- i) The programme-implementing institutions should undertake better due diligence during the procurement process to prevent the firms that lack the required financial capacity to undertake the works before contracts are awarded.
- ii) The land acquisition project under MEMD should be adequately capitalized to enable early acquisition of land before negotiations of financing for the projects can commence.
- iii) The programme-implementing agencies should conduct a more thorough review of the technical aspects of feasibility studies in the lead-up to project implementation. This will avoid design delays due to unforeseen site environmental, geological and geotechnical conditions.



## CHAPTER 1: BACKGROUND

### 1.1 Background

The mission of the Ministry of Finance, Planning and Economic Development (MFPED) is, “*To formulate sound economic policies, maximize revenue mobilization, and ensure efficient allocation and accountability for public resources so as to achieve the most rapid and sustainable economic growth and development.*”

The MFPED through its Budget Monitoring and Accountability Unit (BMAU) tracks the implementation of programmes/projects by observing how values of different financial and physical indicators change over time against stated goals, indicators, and targets (how things are working). The BMAU work is aligned with budget execution, accountability, and service delivery.

Starting in FY 2021/22, the BMAU is undertaking Programme-Based Monitoring to assess performance against targets and outcomes in the Programme Implementation Action Plans (PIAPs) of the third National Development Plan (NDPIII). Semi-annual and annual field monitoring of government programmes and projects is undertaken to verify the receipt and application of funds by the user entities and beneficiaries, the outputs and intermediate outcomes achieved, and the level of gender and equity compliance in the budget execution processes. The monitoring also reviews the coherency in implementing the PIAP interventions; the level of cohesion between sub-programmes; and the challenges of implementation.

The monitoring covered the following Programmes: Agro-Industrialization; Community Mobilization and Mindset Change; Digital Transformation; Human Capital Development; Innovation, Technology Development and Transfer; Integrated Transport Infrastructure and Services; Mineral Development; Natural Resources, Environment, Climate Change, Land and Water Management; Public Sector Transformation; Sustainable Development of Petroleum Resources; and **Sustainable Energy Development**.

This report presents findings from monitoring the Sustainable Energy Development Programme for the budget execution period of 1<sup>st</sup> July 2023 and 31<sup>st</sup> December 2023.

### 1.2 Programme Goal

The goal of the Sustainable Energy Development Programme is to meet the energy needs of the country by providing adequate, affordable, clean, and reliable energy for sustainable socio-economic growth and development. The SED Programme consists of 4 sub-programmes namely: Generation, Transmission and Distribution, Renewable Energy Development, and Energy Efficiency and Conservation.

The lead MDA for the implementation of the programme is the Ministry of Energy and Mineral Development (MEMD), with other key implementing agencies being the Uganda Electricity Transmission Company Limited (UETCL) and Uganda Electricity Generation Company Limited (UEGCL).



### 1.3 Programme Objectives

The specific objectives of the programme are:

- Increase access and utilization of electricity
- Increase the generation capacity of electricity
- Increase adoption and use of clean energy, and
- Promote utilization of energy-efficient practices and technologies.

### 1.4 Programme Outcomes and Indicators

The NDP III outlines outcomes and the targets to be delivered under each of the programme objectives. The indicators in Table 1.1 will be used to measure the progress toward the outcomes of the programme.

**Table 1.1: Sustainable Energy Development Outcomes and Indicators**

Outcome	Indicators
<b>Objective 1: Increase access and utilization of electricity</b>	
Increased electricity access	Increase the percentage of households with access to electricity from 50% to 80%.
	Increase grid reliability from 88% to 90%.
	Increase electricity consumption per capita (kWh per capita) from 100kWh to 578kWh.
	Increase the length of High voltage transmission lines (km) from 2354km to 4354km.
	Increase the length of the distribution network from 45,423.1km to 70,000km.
<b>Objective 2: Increase electricity generation capacity</b>	
Increased electricity generation capacity	Increase electricity generation capacity from 1,252.3MW to 3500MW
<b>Objective 3: Increase adoption and use of clean energy</b>	
Increased energy consumption	Increase primary energy consumption (million tonnes of oil equivalent) from 15.2 to 21.74 million tonnes of oil equivalent
<b>Objective 4: Promote utilization of energy-efficient practices and technologies.</b>	
Increased consumption of alternative clean cooking energy	Reduce total energy losses (%) on the distribution network from 19.6% to 12.6%.
Efficient energy utilization	Increase % of adoption of energy-efficient technologies from 30% to 50% across all consumer categories

*Source: NDP III*



## CHAPTER 2: METHODOLOGY

### 2.1 Scope

This monitoring report is based on selected interventions in the Sustainable Energy Development Programme. The monitoring covered interventions implemented during FY 2022/23 (1<sup>st</sup> July 2022 -30<sup>th</sup> June 2023). The interventions and respective outputs reviewed under each sub-programme; Ministry, Department, and Agency/(MDAs)/Vote/Local Governments are listed in Table 2.1

**Table 2.1: Interventions, Outputs, and Implementing Agencies**

Intervention	Outputs	Implementing Agency
Undertake preliminary development of large-generation plants	Construction of Nyagak III HPP	UEGCL
	Construction of Karuma HPP	
	Completion of defects liability Period for Isimba HPP	
Seek approvals for the construction of a nuclear power generation	Atomic Energy Amendment Bill prepared	MEMD
	Awareness of the nuclear energy conducted	
	Preparation for construction of a Centre for Nuclear Science and	
	Local content strategy for nuclear energy development prepared	
	Spent fuel and radioactive waste management strategy for Uganda	
	Bilateral and multilateral cooperation coordinated	
Expand and Rehabilitate the Transmission Network	Distance in km of high voltage lines added to the transmission grid.	UETCL
	Capacity of transformer capacity (MVA) added to the grid	
Expand and Rehabilitate the Distribution Network	No. of km of medium voltage lines added to the grid	MEMD
	No. of km of low voltage lines added to the grid	MEMD
Reduce End User Tariffs	No. of Last-mile connections made	MEMD
Promote the use of new and renewable energy solutions	Increased deployment of new renewable Energy solutions	MEMD
	Off-grid mini-grids based on renewable energy promoted	
	Development of grid-connected renewable energy systems	
	Electric transport solutions promoted	
	Net metering framework developed	
	Technical capacity in renewable energy solutions developed	
	Increased uptake in improved cook stoves	
Promote the use of energy-efficient equipment for both industrial and residential consumers	Utilization and adoption of efficient cooking techniques	MEMD
	Energy management among high energy consuming facilities integrated and energy efficiency /conservation potential	MEMD
	Awareness of energy efficiency and sustainable energy utilization created	MEMD
	Complimentary policies on energy efficiency developed	MEMD

*Source: Author's Compilation*



Monitoring involved analysis and tracking of inputs, activities, processes, outputs, and in some instances intermediate outcomes as identified in the Programme Implementation Action Plan (PIAP), Ministerial Policy Statements and Semi-Annual and Quarterly work plans, progress and performance reports of MDAs and LGs.

A total of 7 interventions in the MPS were reviewed. The 7 reviewed interventions translated into 90% coverage of the approved budget for the FY2022/23. The selected interventions monitored were:

- Undertake preliminary development of large-generation plants
- Finalize plans for the development of nuclear power generation
- Expand and Rehabilitate the Transmission Network
- Expand and Rehabilitate the Distribution Network
- Establish mechanisms to reduce the end-user tariffs
- Promotion of the use of new and renewable energy solutions
- Promote the use of energy-efficient equipment for both industrial and residential consumers

## 2.2 Approach and Sampling Methods

Both qualitative and quantitative methods were used in the monitoring exercise. The physical performance of interventions, planned outputs, and intermediate outcomes were assessed through monitoring a range of indicators. The progress reported was linked to the reported expenditure and physical performance.

A combination of random and purposive sampling was used in selecting interventions and outputs from the PIAPs, Ministerial Policy Statements (MPS), and progress reports of the respective Ministries, Departments, and Agencies for monitoring.

To aid mapping PIAP interventions against annual planned targets stated in the Vote MPS and quarterly work plans, a multi-stage sampling was undertaken at four levels: i) Sub-programmes ii) Sub-sub-programmes iii) Local governments, and iv) Project beneficiaries. Regional representation was considered in the selection of districts and outputs.

## 2.3 Data Collection and Analysis

### 2.3.1 Data collection

The monitoring team employed both primary and secondary data collection methods. Secondary data collection methods include:

Literature review from key policy documents including, Ministerial Policy Statements (MPS) FY 2022/23; National and Programme Budget Framework Papers; A Handbook for Implementation of NDPIII Gender and Equity Commitments, PIAPs, (NDP III), quarterly progress reports and work plans for the respective implementing agencies, Quarterly Performance Reports, Budget Speech, Public Investment Plans, Approved Estimates of Revenue and Expenditure, project reports, strategic plans, policy documents, aide memoires and evaluation reports for selected programmes/projects.

Review and analysis of data from the Integrated Financial Management System (IFMS); Programme Budgeting System (PBS); Budget Portal; Quarterly Performance Reports and Bank statements from some implementing agencies.



Primary data collection methods on the other hand include:

- Consultations and key informant interviews with Institutional heads, project/intervention managers, household heads, and service beneficiaries at various implementation levels.
- Field visits to various districts, for primary data collection, observation, and photography.
- Callbacks in some cases were made to triangulate information.

### 2.3.2 Data Analysis

The data was analysed using both qualitative and quantitative approaches.

Qualitative data was examined and classified in terms of constructs, themes, or patterns to explain events among the beneficiaries (interpretation analysis) and reflective analysis where the monitoring teams provided an objective interpretation of the field events. Quantitative data on the other hand was analyzed using advanced Excel tools that aided interpretation.

Comparative analyses were done using percentages, averages, and cross-tabulations of the outputs/interventions; intermediate outcome indicators, and overall scores. Performance of outputs/interventions and intermediate outcome indicators was rated in percentages according to the level of achievement against the annual targets. The sub-programme score was determined as the weighted aggregate of the average percentage ratings for the output/intermediate outcomes in the ratio of 65%:35% respectively.

The overall programme performance is an average of individual sub-programme scores assessed. The performance of the programme and sub-programme was rated based on the criterion in Table 2.2. Based on the rating assigned, a BMAU colour-coded system was used to alert the policymakers and implementers on whether the interventions were achieved or had very good performance (green), good performance (yellow), fair performance (light gold), and poor performance (red) to aid decision making.

**Table 2.2: Assessment guide to measure performance in FY 2022/23**

Score	Performance Rating	Comment
90% and above	Very Good	Very Good (Achieved at least 90% of outputs and outcomes)
70%-89%	Good	Good (Achieved at least 70% of outputs and outcomes)
50%- 69%	Fair	Fair (Achieved at least 50% of outputs and outcomes)
49% and below	Poor	Poor (Achieved below 50% of outputs and outcomes)

*Source: Author's Compilation*

### Ethical considerations

Introduction letters from the Permanent Secretary/Secretary to Treasury were issued to the respective MDAs monitored. Entry meetings were held with the Accounting Officers or delegated officers upon commencement of the monitoring exercise. Consent was sought from all respondents including programme or project beneficiaries. All information obtained during the budget monitoring exercise was treated with a high degree of confidentiality.



## 2.4 Limitations

- i) Limited credible outcome performance data in the programme institutions; in some cases, the analysis was done at the output level.
- ii) Lack of reliable and real-time financial data on donor financing which was not accessible on the Integrated Financial Management System (IFMS).
- iii) Limited access to credible expenditure data especially for agencies/subventions that still operated manual accounting systems.

## 2.5 Structure of the Report

The report is structured into four chapters. These are the introduction, Methodology, Programme Performance, Conclusion and Recommendations respectively.





## CHAPTER 3: PROGRAMME PERFORMANCE

### 3.1 Overall performance

#### Financial Performance

The overall budget release under the Sustainable Energy Development (SED) Programme was good at poor at 29.56%. The poor financial performance was due to a low disbursement under the Generation Sub-programme, in particular works on the Karuma HPP. The programme financing by 31<sup>st</sup> December 2023 is summarized in Table 3.1.

**Table 3.1: Financing of the Sustainable Energy Development Programme at 31<sup>st</sup> December 2023**

Sub-Programme/ Cost Centre	Budget (Ug shs Bn)	Release (Ug shs Bn)	Expenditure ( Ug shs Bn)	Release as % of budget	Expenditure as % of release
Generation	555.101	41.01	38.687	7.39	94.34
Transmission and Distribution	778.389	328.95	232.153	42.26	70.57
Renewable Energy Development	8.413	2.444	1.301	29.05	53.23
Energy Efficiency and Conservation	1.878	0.986	0.638	52.50	64.71
Finance and Administration	101.407	53.82	35.147	53.07	65.30
<b>Overall Performance</b>	<b>1445.188</b>	<b>427.21</b>	<b>307.926</b>	<b>29.56</b>	<b>72.08</b>

*Source: IFMS and PBS Quarterly Reports*

#### Physical performance

The overall performance of the programme was fair at 58.9%. There was an improvement in the works on the ongoing transmission projects and large hydropower generation projects (Table 3.2). The Transmission and Distribution Sub-programme works although hindered by RoW showed improved progress during the first half of the FY2023/24.

During the first half of the FY2023/24, the Gulu-Agago Transmission Line was energized. Under the Grid Extension and Reinforcement Project (GERP), the Kole-Gulu Line was completed and the two substations (Kole-Gulu) energized. There was significant progress on the Karuma HPP works and the commissioning of five of the six units had been completed bringing the total added generation to 500MW. The final commissioning tests were being undertaken on unit no.5.

**Table 3.2: Summary of Performance for the Sustainable Energy Development Programme by 31<sup>st</sup> December 2023**

Sub-programme	Performance (%)
Generation	69.2
Transmission and Distribution	61.5
Renewable Energy Development	50.0
Energy Efficiency and Conservation	55.0
<b>Overall Performance</b>	<b>58.9</b>

*Source: Author's Compilation*



## 3.2 Generation Sub-programme

The sub-programme objective is to ensure adequate generation capacity for economic development and it contributes to the programme outcome of “increased electricity generation capacity added to the grid”. The outcome indicator for the sub-programme is the generation capacity in MW added to the grid. The planned interventions under the sub-programme are: Undertake preliminary development of large generation plants and finalize plans and approvals for construction of a nuclear power generation plant.

### Performance

The overall sub-programme performance was fair at 69.2 % (Table 3.3). The interventions partly met the planned target of increasing the generation capacity by commissioning of additional 300MW at Karuma HPP against the planned target of 600MW. The total budget for the interventions under the sub-programme was Ug. shs 377.6bn, of which Ug. shs 511.65bn was released and Ug shs 511.66bn spent.

**Table 3.3: Performance of interventions under the Generation Sub-programme**

Intervention	Performance Rating	Remarks
Undertake preliminary development of large-generation plants		Fair performance of 68.3%. All work on units 1-5 was completed. 500MW of the generation capacity of Karuma HPP commissioned.
Finalize plans and approvals for nuclear power generation		Good performance of 70%. The Atomic Energy Bill was approved by the Cabinet, and the draft bill was under review. Bilateral cooperation on nuclear energy was signed.
<b>Average performance intervention</b>		<b>Fair performance at 69.2%</b>

*Source: Author's Compilation*

### 3.2.1 Undertake preliminary development of large hydropower generation plants

The intervention is jointly implemented by Uganda Electricity Generation Company Limited (UEGCL) and the Ministry of Energy and Mineral Development (MEMD). The planned outputs under the intervention were the construction of Nyagak III HPP, Karuma HPP, and the completion of Isimba HPP defects liability.

#### Performance of the intervention

The performance of the intervention was fair at 53.3%. The budget for the intervention was Ug shs 376.7bn, of which Ug shs 511.12bn was released and spent. The expenditure exceeded the budget due to the payment of pending invoices on the Karuma HPP works totalling Ug shs 150.87bn. The intervention partially achieved the main target of increasing the generation capacity by the addition of 300MW to the grid.

#### Construction works on Nyagak III HPP

Construction works on Nyagak III HPP were ongoing in Zombo District with overall progress at 93%. Completion of the project was delayed due to funding challenges because the private partners failed to obtain financing. The Government may be required to avail Ug shs 22bn in financing to



complete the remaining works. The structural works on the access roads, dam structure surge tank, pipe conduit, penstock anchor blocks, and penstock piping were complete.



**L-R: Completed dam structure at Nyagak III HPP; Newly installed control and switching panels in the Nyagak III powerhouse**



**The two installed turbines in the Nyagak III HPP Powerhouse**

Civil works on the powerhouse were at 85% with the casting of equipment foundations complete. The ongoing works included; masonry walls, a gantry yard, a main inlet valve, and wall construction for the tail race. Electromechanical work involving the installation of two spiral casings and draft tubes had been completed. The delivery to the site and installation of the transformers and turbine generators had been done. Progress on 34 blocks of staff housing was at 75% with electrical wiring, plastering, tiling, and plumbing completed. The construction of the power evacuation line had not commenced.

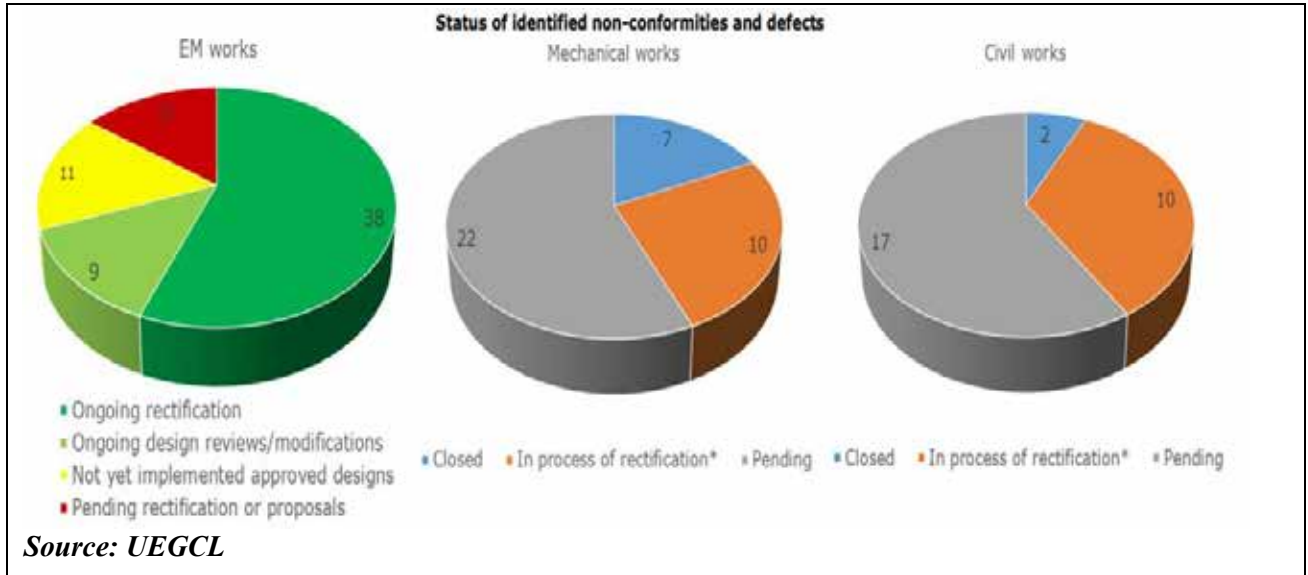
The major issue affecting the Nyagak III project was the delay by the project's private partners to obtain the planned loan financing whereas the project was at a critical stage of project implementation. This project needs a forensic audit to better determine the financial contribution the private partners have made.

### **Completion of Karuma HPP works**

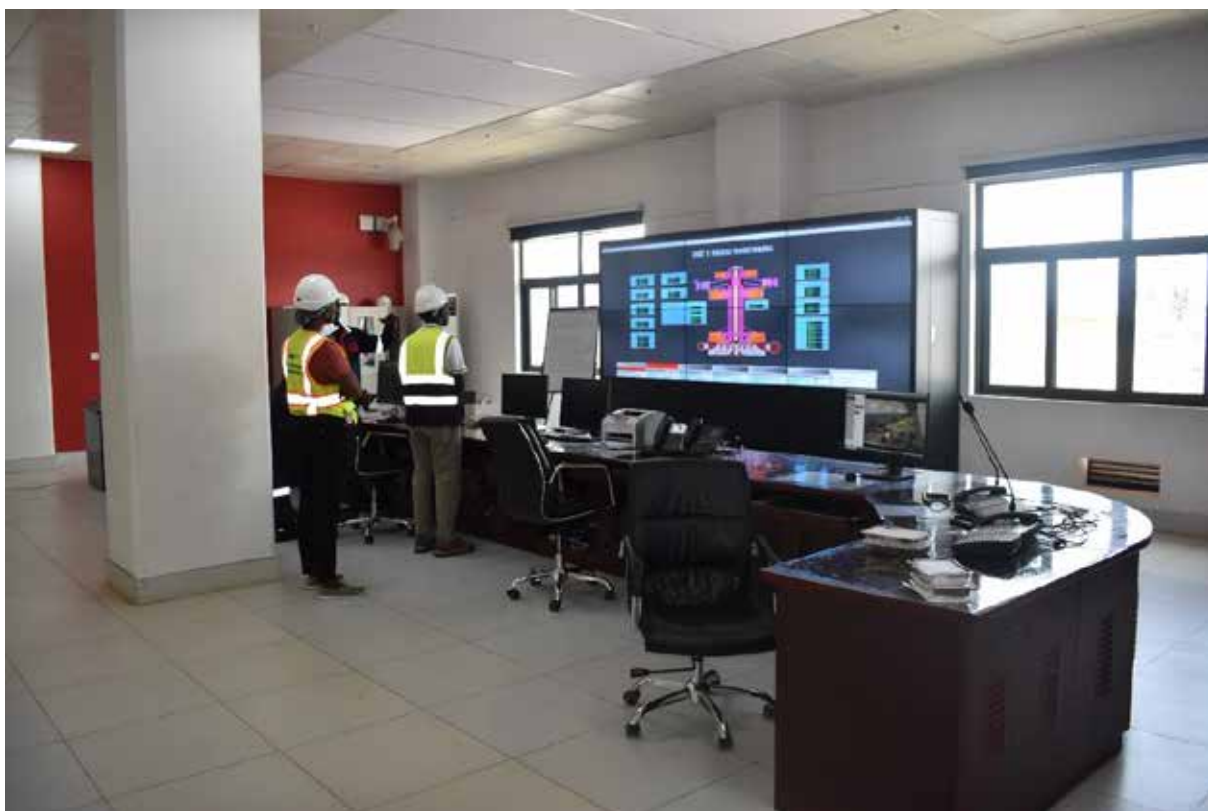
Construction works for Karuma HPP progressed from 99.9% at the end of FY2022/23 to 99.98% in the middle of FY2023/24. The project contract period was granted a final extension up to August 2024 to allow the completion of the remaining works. The total gross certified payment to the contractor is USD 1,382,606,092; which equates to 98.86% of the original contract price of USD 1,398,516,759. The project is delayed by 60 months, with time progress at 120 months of the original 60-month contract duration.

All major civil, electrical and electromechanical works at Karuma HPP had been completed at the project. Unit start-up commissioning of five units (#1, #4, #3, #2 & #6) was completed and the totalling up to 500MW was successfully synchronized on the national grid with all necessary tests done. The sixth unit (unit #5) suffered stator winding damages during wet commissioning and the required repair works involving the replacement of the damaged insulation in the generator windings were close to completion.

Delays in clearing the identified snags was hampered by the contractual disagreements between UEGCL and Sino Hydro, and an adjudicator to the contract had not been nominated by MEMD to resolve some of the long outstanding issues. The total number of defects on the project concerning the dam works is 126 in total (68 for the civil works, 39 for mechanical works, and 28 for electromechanical works). Progress of rectification for the different categories of defects is illustrated in Figure 3.1.



**L-R: Completed spillway and dam structure; Inside the completed powerhouse building at Karuma HPP**



**Completed Karuma HPP control room showing the plant operator's work station and screen**

The major snags still to be resolved on the project were the replacement of the damaged log boom and the contractor submitted a design which the Owner's Engineer rejected as it was found to be technically inadequate. The continued accumulation of trash due to the lack of the log boom was frequently clogging the intakes to the turbines.

The overall completion progress for the transmission component of the project was 100%. The pending works on the 73.1km Lira-Karuma transmission line were completed and the Lira substation energized. The project experienced a major incident of vandalism of 5 towers have now been reconstructed. The five other towers that were identified to be defective during inspection were also redone and the transmission line eventually energized on 26<sup>th</sup> October 2023.

Progress of the work on the Employer's Permanent Camp was as follows: Completion of Zone A of Employer's Permanent Camp, the main buildings of Zone B of Employer's Permanent Camp were also completed. The pending works were landscaping and construction of the four gatehouses for the different facilities at 85% progress. Works on the leisure facilities such as the children's park, and sports facilities such as the football field were ongoing with the concrete surface completed for the tennis and basketball courts. Construction of the water treatment and storage system and the laying of the water transmission network was completed. The wastewater treatment systems were also completed and the system was operational.

The Community Development Action Plan for Karuma HPP did not receive any funding during the first half of FY 2023/24. Construction of the 119 resettlement houses at Lapono Village for the vulnerable project-affected persons on the Karuma HPP had not commenced. The MEMD was procuring a consultant to undertake an Environmental and Social Impact Assessment (ESIA) at the proposed construction site. The commencement of this construction was long overdue and some of the vulnerable PAPs have since died.



### **3.2.2 Finalize plans and approvals for construction of a nuclear power generation plant**

The planned outputs under the intervention are: Atomic Energy Act, 2008 finalized; Awareness of nuclear energy conducted; Preparation for construction of a Centre for Nuclear Science and Technology conducted; Spent fuel and radioactive waste management strategy for Uganda prepared and implemented; IAEA cooperation coordinated.

#### **Performance of the intervention**

The performance of the intervention was fair at 70%. The siting for the planned nuclear generation plant was completed and the community engagement commenced. The Nuclear Unit under MEMD also continued to engage and receive technical support from the International Atomic Energy Agency (IAEA). The budget allocation for this intervention was Ug shs 0.8bn, of which Ug shs 0.535bn was released and Ug shs 0.535bn spent.

#### **Amendment of the Atomic Energy Act, 2008 finalized**

Cabinet reviewed the final draft principles for amending the Atomic Energy Act, 2008, and approved it on 12<sup>th</sup> June 2023, subsequently, 8 technical meetings have been held to review the draft bill.

#### **Awareness of the nuclear energy conducted**

One sensitization seminar was conducted at Soroti University on the Centre for Nuclear Science and Technology. Engagement of PAPs for the Buyende Nuclear Power Project in Buyende District was undertaken and 1,200 PAPs participated in the engagement.

#### **Human resource development plan for the nuclear power plant finalized**

Data for modelling human resource requirements for the nuclear power programme was collected. A retreat on the human resource planning framework for nuclear facilities was conducted in collaboration with the Ministry of Public Service.

#### **Bilateral cooperation on nuclear energy co-ordinated and implemented**

Bilateral meetings were held to discuss cooperation proposals from Hunton Andrews, GNE Advisory, Worley and Replanet Africa. A Memorandum of Understanding (MoU) on capacity building for the nuclear industry in Uganda was signed between the MEMD and Lesedi Nuclear Service (Pty) Ltd.

#### **Nuclear Fuel supply strategy implemented**

The draft Nuclear Fuel Supply Strategy for Uganda was revised following the approval by the Cabinet of Energy Policy for Uganda, 2023 with revised electricity generation targets. Feasibility studies and ESIA for the Centre for Nuclear Science and Technology (CNST) were undertaken. A field activity for uranium exploration was undertaken in Lwensankala, Sembabule District in September 2023. Pitting and trenching were carried out within the uranium anomaly, samples were collected and taken to the laboratory for analysis.



## Nuclear waste management strategy for Uganda prepared and implemented

A virtual International Atomic Energy Agency (IAEA) expert mission reviewed the Spent Fuel and Radioactive Waste Management Strategy for Uganda in September 2023 and the Terms of Reference (ToRs) for siting a Centralized Radioactive Waste Management Facility were updated. A member of staff participated in the IAEA training on Borehole Disposal of Disused Sealed Radioactive Sources (DSRS) in Kuala Lumpur, Malaysia, from 4th to 15th September 2023.

## IAEA Technical cooperation coordinated

Regional animal disease diagnostic centres in Moroto and Tororo Districts were monitored. Ten IAEA-supported technical cooperation projects in the fields of agriculture, safety, uranium exploration, energy and water resources were implemented. A detailed analysis of the performance of the Generation Sub-programme interventions is in Table 3.4.

**Table 3.4: Performance of the Generation Sub-programme by 31<sup>st</sup> December 2023**

Intervention	Output	Annual Budget (Ug shs)	% of budget received	% of budget spent	Semi-Annual Target	Physical score (%)	Remark
Undertake preliminary development of large-generation plants	Construction of Nyagak III HPP	22.95	60.77	99.9	100.00	70.00	Nyagak III works progressed to 95% with dam works and most electro-mechanical works completed
	Construction of Karuma HPP	451.46	3.28	97.4	100.00	70.00	Overall progress at 99.98%. Units 1, 2, 3, 4 and 6 were commissioned.
	Completion of defects liability period for Isimba HPP	14.63	62.89	93.7	100.00	65.00	The defects liability period expired in March 2023 and the contractor is to continue fixing previous defects.
Finalize plans and approvals for nuclear power generation	Amendment of the Atomic Energy Act, 2008 finalized	0.49	51.32	54.5	50.00	70.00	A review of the draft bill was ongoing.
	Awareness of the nuclear energy conducted	0.49	51.32	54.5	50.00	70.00	1,200 PAPs sensitized



Intervention	Output	Annual Budget (Ug shs)	% of budget received	% of budget spent	Semi-Annual Target	Physical score (%)	Remark
	Human resource development plan for nuclear power plant finalized	0.49	51.32	54.5	50.00	70.00	Steering team for technology centre created and MoU signed and to oversee implementation.
	Bilateral cooperation on nuclear energy coordinated and implemented	0.49	51.32	54.5	50.00	70.00	MoU on capacity building signed.
	Nuclear fuel supply strategy developed	0.49	51.32	54.5	50.00	70.00	Collection of uranium samples.
	Nuclear waste management strategy for Uganda implemented	0.49	51.32	54.5	50.00	70.00	ToRs for siting waste management updated.
	IAEA Technical cooperation implemented	0.49	51.32	54.5	50.00	70.00	10 IAEA-supported projects monitored
		<b>492</b>				<b>69.2</b>	<b>Output performance</b>

Source: Field Findings and MEMD Q4 Reports

### Challenges under the Sub-programme

- Several major defects have not been addressed on Karuma HPP even after the commissioning of five of the planned six-generation units. One of the long pending works is the log-boom that has not been installed and whose proposed designs had not been approved.
- The programme has not handled social issues on the project promptly and to date the resettlement of the displaced project-affected persons who were to be relocated to Lapono has not been undertaken since 2013.

### Conclusion

Overall, although the Generation Sub-programme continued to make progress towards increasing the power generation capacity on the grid. The commissioning of Karuma HPP is in the final stages and by 31<sup>st</sup> December 2023 five of the six generation units had been commissioned. The commissioning of the last unit (No.5) was underway and the final tests were ongoing. The UEGCL and MEMD should ensure that the remaining works and the pending defects are addressed conclusively.





## Recommendation

Appointment of an adjudicator to help resolve the implementation challenges on the Karuma HPP needs to be done as soon as possible by MEMD and UEGCL so that the contentious issues on the project can be resolved.

### 3.3 Transmission and Distribution Sub-programme

The sub-programme is responsible for promoting; increased investment in power transmission and rural electrification. The sub-programme contributes to the programme outcome of “*increased access and utilization of electricity*”. The outcome indicators for the sub-programme are; increased electricity access and reduction in losses on the grid.

The planned interventions under the sub-programme are: to expand and rehabilitate the transmission network, expand and rehabilitate the distribution network and reduce end-user tariffs. The sub-programme performance was fair at 61.5% with a budget of Ug shs 778.389 bn, while the released funds amounted to Ug shs 328.95 bn and the total expenditures was Ug shs 232.153bn.

#### Performance of interventions

The overall performance of the interventions under the sub-programme showed great improvement at 52.7% (Table 3.5). Some of the highlights under the sub-programme include the completion of all the Lots under the African Development Bank-funded Uganda Rural Electricity Access Project (UREAP), including the grid interconnection with Bugala Island. The Gulu-Agago and Kole-Gulu Transmission segments were energized therefore adding Gulu town to the transmission grid.

**Table 3.5: Intervention performance for Transmission and Distribution Sub-programme**

Intervention	Performance Rating	Remarks
Expand and Rehabilitate the Transmission Network		Good performance at 77%. Gulu-Agago and Gulu-Kole transmission lines energized. Works on the Gulu, Nebbi and Kole substations were substantially completed.
Expand and Rehabilitate the Distribution Network		Good performance of 70. Several km of MV and LV were completed countrywide
Reduce End User Tariffs		Poor performance. Only 12,478 free connections were made out of the planned 300,000 annual target.
<b>Overall intervention performance</b>		<b>Fair performance at 52.7%</b>

*Source: Authors' Compilation*

#### 3.2.1 Expand the Transmission Network to Key Growth Areas

The intervention is the responsibility of Uganda Electricity Transmission Company Limited (UETCL) and MEMD. The performance indicators under the intervention were: the number of kilometres of high voltage lines added to the grid, and the distance in km of the rehabilitated transmission network. The major planned outputs under the intervention were the following transmission projects:



- Entebbe-Mutundwe Expansion Project
- 132kV Mirama-Kable Transmission Project
- Grid Expansion and Re-enforcement Project
- Gulu Agago Transmission Project
- Masaka-Mbarara Expansion
- Kampala Metropolitan Transmission Project
- Kikagati-Nshongezi
- Power supply to industrial parks II

The intervention performance was poor at 40%. During the first half of FY2022/23, the long-delayed Lira-Karuma Transmission Line was completed and energized. In quarter 4 of the FY, the works on the Mutundwe-Entebbe Transmission Project were completed and the project energized. Works on other ongoing projects such as the Kabale-Mirama, Gulu-Agago, and Kole-Gulu-Nebbi-Arua transmission projects were progressing at a slow pace and were behind schedule due to the failure of contractors to adequately mobilize for the works.

### **Entebbe-Mutundwe Expansion Project**

The Entebbe-Mutundwe Expansion Project's objective is to provide reliable and quality power to Entebbe town and its environs. The scope of the project is the construction of a new 132kV substation at Entebbe town, an extension of the Mutundwe 132kV busbar and a 24 km double circuit 132kV transmission line from Mutundwe substation to the new Entebbe substation.

The budget was Ug shs 16.539bn of external funds. By 31<sup>st</sup> December 2023, disbursement stood at Euro 10.442 million (69.62%) for the loan component, while for the grant component, Euro 5.747 million (93%) had been disbursed. The loan expiry on 24<sup>th</sup> October 2023 affected the final payments to the contractors on the project.



**Completed 132/33kV Entebbe Substation**

Overall progress was 100 % with most of the works completed by 30<sup>th</sup> June 2023. The extension of the Mutundwe 132/33/11 kV substation by two-line bays and construction of a new 132/33kV double bus bar substation at Entebbe with two-line bays was completed and substations were energized in May 2023. The rectification of the pending snags on the transmission lines and the substations was affected by the inability of UETCL to pay the pending invoices due to the expiry of the loan period. The MFPED has yet to approve an extension of the loan expiry period to 24<sup>th</sup> May 2024 to allow clear the pending invoices totalling Euros 700,000.

### **Construction of 132 kV Mirama-Kabale Transmission Project**

The scope of the project is to construct an 85km transmission line from the Mirama substation and connect it to a newly constructed substation at Kabale, and construction of rural grid extension lines in the region. The funding for the project is GoU (Ug shs 40bn) and Islamic Development Bank (IsDB) loan of USD 83.75 million (USD 37.82 million for the transmission component and USD 45.93 Million for the rural grid extensions). The project budget for FY2023/24 was Ug shs 69.85bn, of which Ug shs 11.71bn was released and Ug shs 11.702 bn spent.

By 31<sup>st</sup> December 2023, USD 11.768 million (31.1%) of the total loan amount of USD 37.82 million had been disbursed. The low disbursement is because the progress of the ongoing transmission works was slow and other works for the substations just commenced in July 2023.

There slow progress of works on the transmission line continued during FY2023/24 and the planned completion date of February 2024 will not be met. The contractor was struggling with cash flow constraints which was affecting the contractor's ability to mobilize for the works and order for the remaining tower materials. The progress of the works on the T-line was as follows:

260 of the planned 294 foundations were completed, and 157 of the planned 294 towers were erected. The stringing of 14km out of the planned length of 85km had been undertaken.



**Top: Ongoing civil and earthworks at the 132/33 kV substation site**



**L-R: Completed resettlement house on the Kabale-Mirama Transmission Project; Part of a strung section on the Mirama-Kabale Transmission Project in Ntungamo District**



The contract for Lot 2 (Kabale 132/33 kV substation and extension of the 132kV Busbar at Mirama Substation) works started on 3<sup>rd</sup> July 2023 and overall progress was at 22%. The earthworks at the Kabale substation were at 90% complete while detailed design for the electrical equipment was still ongoing with progress at 70% and civil engineering designs at 23%. Manufacturing of equipment such as the surge arrestors and the disconnectors was completed. The manufacturing of the power transformers was ongoing and was expected to be completed by February 2024. The RAP implementation on the project was at 96% with 2434 of the 2,534 PAPs paid. The acquisition of the 5.45 acres for the Kabale substation had been fully done to enable works to commence.

### **Grid Extension and Re-enforcement Project**

Under the World Bank-funded Grid Extension and Re-enforcement Project (GERP), works were ongoing to connect West Nile to the national grid through the construction of 294 km of 132kV double circuit transmission line from Kole, through Gulu and Nebbi, to Arua as well as new four substations at Kole, Gulu, Nebbi and Arua with a transmission interconnection from Gulu to Olwiyo.

The project budget for FY2023/24 is Ug shs 35.63bn, with Ug shs 0.209bn released and Ug shs 0.124bn spent during the FY. The loan disbursement at the end of the FY was SDR 47.885 million which is 74.4% of the total loan amount.

By half year 2023/24, the overall progress of the transmission works (Lot 1) was at 90 % which was a slight improvement from 86% at the end of FY2022/23. A total of 864/897 foundations had been constructed (96%) and 837/897 towers erected (93%). Stringing was 45% complete with 129/289km having been strung. The T-line works were experiencing delays due to RoW and a total of 80km of the T-line cannot be strung due to outstanding RoW issues. Also, 15 tower foundations and 9 towers could not be constructed due to RoW.



**Top Left: Tower stringing on the Gulu-Nebbi transmission segment at Acwera village, Nebbi district**  
**Right: Tower erection on the left bank of the Nile at Packwach**  
**Bottom Left: Works on plant house and switchyard at Nebbi substation**

The overall progress of construction of the Kole and Gulu substations (Lot 2) increased from 93% in the previous to 96% with all electromechanical and electrical equipment works completed. The Kole and Gulu substations were energized on 29<sup>th</sup> November 2023 and 17<sup>th</sup> November 2023 respectively. The major pending works at these two locations were the drainage works and the switchyard roads.

Progress of construction of Nebbi and Arua substations (Lot 3) increased from 92.2% at the end of FY2022/23 to 94%. All major electrical and electrotechnical equipment had been installed at the tow substations and pre-commissioning testing was ongoing at the Nebbi substation.

Compensation of Project Affected Persons (PAPs) was at 93% (3,307/3,566) complete. The Kole-Gulu T-line section corridor acquisition stood at 99%, while the Gulu-Arua section was at 90% (2,312/2,556) of the PAPs paid. Construction of the 65 resettlement houses for physically displaced households that opted for in-kind resettlement was at 75.5% complete. The overall progress of the works is very unsatisfactory due to the contractor's cash flow challenges with work on 6 houses yet to commence.

## Gulu-Agago Transmission Project

The scope of the project includes FY2021/22, construction of an 83km transmission line connecting Gulu substation to a newly constructed substation at Agago commenced. The funding of the project is a 40 million Euro loan from KfW and the aim is to evacuate electricity from Agago and Achwa hydropower plants.

The project budget during the FY 2023/24 was Ug shs 108.9bn, of which Ug shs 50.7bn was released and spent. Most of the released funds were for payment of deemed energy to the Achwa HPP developer. The total amount disbursed on the loan by half year 2023/24 was Euros 16.246 million (41%) of the EUR 40 million loan.

Overall project progress of the works for the transmission line (Lot 1) was 99%. All of the planned 254 towers of the line were erected and the stringing of the planned 83km of the T-line was completed. The transmission line was energized on 18<sup>th</sup> November 2023 and the major pending aspects of the project were the snags and supply of the O&M tools. The substation works were behind schedule and the T-Line had been energized without completion of the new Agago substation. However, the busbar extension works at Gulu and the Agago HPP were complete.



L-R: Completed Gulu-Agago T-Line; Ongoing works on the Agago substation switchyard

The overall progress of substation works (Lot 2) was at 98.4%. The extension bays at the Gulu substation and Agago HPP switchyard were energized on 18<sup>th</sup> November 2023. Testing and commissioning of the new Agago substation was ongoing at 81% progress. The new planned completion date for the substation was set to 31<sup>st</sup> January 2024.

The RAP implementation was at 98%, with 464 of the 473 PAPs paid. There was no progress in the payment of PAPs during the first half of FY2023/24. Additionally, construction of the resettlement houses had not progressed well and completion of the seven pending hoses was extended to 29<sup>th</sup> February 2024.

## Masaka-Mbarara 400kV Transmission Line Project and Associated Sub-stations

The project is jointly funded by Kreditanstalt für Wiederaufbau/German Development Bank (KfW), Agence Française de Développement(AFD)/ French Development Bank, and the Government of Uganda. The KfW loan is Euro 35 million, while the AFD loan amount is Euro 37.1 million.



The project scope comprises: the construction of a 132km long 400 kV double circuit transmission line between the 220kV Masaka substation and the 220kV Mbarara North substation and the addition of two new line bays at both Masaka and Mbarara substations.

The project budget was Ug shs 99.7bn, while Ug shs 13.734bn was released and spent during the FY. The disbursement on the AFD loan was EUR 120,687 (0.3%) while that on the KfW loan was Euro 111,907(0.3%). The loan periods for both funders were due to expire before construction works commenced. The MFPED requested loan extensions up to 30<sup>th</sup> June 2026 for the KfW loan and 31<sup>st</sup> December 2026 for the AFD loan and approvals were still being awaited.

Disbursement of the loan funds was still very low due to delays in the procurement of the Engineering, Procurement and Construction (EPC) contractors. The delays in the procurement have arisen due to whistle-blower complaints to the Inspectorate General (IGG) and Public Procurement and Disposal of Public Assets Authority (PPDA) investigations. UETCL was therefore in the process of seeking a no-objection from the funder to consider the selection of the second-best evaluated bidder.

Due to the long delays in the project, MFPED awaits a response from KfW, seeking an extension of the loan until 30<sup>th</sup> June 2026. An extension was also sought on the AFD loan until 31<sup>st</sup> December 2026. The RAP implementation was at 71% (1,879 of the 2,650 PAPs) compensated. A total of 211(37%) of the original land titles were received from the PAPs out of the expected 572 land titles. The sub-division of 83 out of 162 titles was completed by the consultant and returned to UETCL.

### **Kampala Metropolitan Transmission System Improvement Project**

The Kampala Metropolitan Transmission System Improvement Project aims to reinforce the electricity grid in the Kampala metropolitan area for a reliable future supply of electricity. The project funding is a loan of Japanese Yen (JPY) 13.659bn from the Japan International Corporation Agency (JICA), the cost of the Resettlement Action Plan is to be covered by GoU counterpart funding. The loan signature date was 26<sup>th</sup> April 2018.

The scope of the project includes: Construction of a new Mukono 3x125MVA, 220/132kV substation; new Buloba 2x125MVA, 220/132kV substation; a new Kawaala 2x40MVA 132/33kV substation; 1x20MVA 132/11kV Upgrade), Mutundwe Substation reconfiguration to double Busbar (upgrade), procurement of a new mobile substation 1x20MVA, 132/33kV; procurement of a new 1x250MVA 220/132kV power transformer for Bujagali Substation; Reconductoring of Mukono-Kampala North; Kampala North-Lugogo; Kampala North- Mutundwe transmission lines to High Temperature Low Sag(HTLS) Conductor.

The disbursement on the loan by 31<sup>st</sup> December 2023 was JPY 2,741 million (20%) of the JPY 13,659 million. The budget for FY2023/24 was Ug shs 61.82bn, while the release was Ug shs 0.429bn and the expenditure was Ug shs 0.427bn.

The contracts for Lot 1-Construction of Buloba Substation and associated transmission lines and upgrading of Mutundwe and Bujagali substations was in August 2023 and Lot 2- Construction of the new Mukono substation and associated transmission lines, upgrading of Kawaala Substation and reconductoring Mukono-Kampala North; Kampala North-Lugogo; Kampala North- Mutundwe transmission lines were signed on 7<sup>th</sup> August 2023.



The contractor has undertaken mobilization for the project, and the following activities commenced: Topographic survey for New Mukono, Buloba, Mutundwe, Kawaala, and Bujagali substations; Geo-technical investigations at Buloba substation completed.

The contract for Lot 3 - supply of a mobile substation (132/33-11kV) was signed on 19th May 2023 and an advance payment had been made to the supplier. The design was 66.5% complete and the manufacturing of the auxiliary transformers, 33kV switchgear, trailer and LV panels was ongoing and estimated at 30%. The order for the production of control and protection panels and 132kV XLPE cable jointing material.

Implementation of the RAP was progressing well and 131(92%) of the 141 PAPs were compensated. The corridors of the transmission line and substations along the Mukono, Kawaala and Buloba project areas were demarcated and the substation land was procured. The extra land required in Mukono was acquired.

### 3.2.2 Establish mechanisms to reduce the end-user tariffs

This intervention aims at increasing the number of consumers connected to the grid through the implementation of the free connections policy and provision of a credit support facility in support of wiring for on-grid households & small and medium enterprise (SMEs) connections and three-phase connections for commercial enterprises. The output indicator for this intervention is the number of new connections undertaken. This intervention is being undertaken by MEMD and Uganda Electricity Credit and Capitalization Company (UECCC).

The intervention performance was poor at 8.3% and under the free connection policy<sup>1</sup>, only a total of 12,478 out of 300,000 planned connections were made country-wide using GoU funding and financial support from several development partners<sup>2</sup>. The budget for the free connections policy was Ug shs 7.896bn of which Ug shs 3.282bn was released and Ug shs 1.327bn spent. The connections materials purchased using AfDB funding under UREAP were delivered and connections were expected to increase drastically in the second half of the FY. A detailed report on the breakdown of the free connections made using the different funding sources by the various service providers in FY2022/23 is given in Table 3.6.

**Table 3.6: Free electricity connections for the period 1<sup>st</sup> July 2023 to 31<sup>st</sup> December 2023**

Service Provider	Funding Initiatives							Grand Total
	AFD	AfDB	EXIM BANK	GoU	IDB	KfW	KUWAIT	
KIL	-	-	489	3	-	67	-	559
KIS	-	-	-	41	-	-	-	41
KRECS	-	-	334	59	-	-	-	393
UEDCL	-	-	12	318	38	345	72	785
UMEME	9651	38	-	-	-	890	-	10579
WENRECO	-	-	-	121	-	-	-	121
<b>Grand Total</b>	<b>9,651</b>	<b>38</b>	<b>835</b>	<b>542</b>	<b>38</b>	<b>1,302</b>	<b>72</b>	<b>12,478</b>

<sup>1</sup> Potential beneficiaries are those who require either a no-pole or one pole service for connection to the grid

<sup>2</sup> World Bank, Islamic Development Bank, African Development Bank, Kreditanstalt für Wiederaufbau (KfW)





Source: MEMD

### 3.2.3 Expand and Rehabilitate the Distribution Network

This intervention aims to undertake grid expansion and densification, evacuation of small generation plants and quality of supply projects. The expected outputs under this intervention are to expand and rehabilitate the distribution grid in rural areas and, off-grid and mini-grid distribution lines constructed.

The performance of intervention improved and works under several projects progressed during the first half of the FY2023/24: Energy for Rural Transformation III; Uganda Rural Electrification Access Project; Demand Gap through the Accelerated Rural Electrification Programme and the newly launched Electricity Access Scale Up-Project (EASP).

#### Energy for Rural Transformation III

The components planned under the project are: off-grid energy access for grid extensions and connections, off-grid energy access for solar PV installation for public institutions in rural areas provision of credit facilities to enhance electricity access and quality standards enforcement support, and lastly, institutional strengthening and impacts monitoring to finance transaction advisor (TA) and capacity development to accelerate electricity access and support the Government to carry out an impact monitoring and evaluation of ERT III.

The project completion date was extended from 30<sup>th</sup> June 2023 to 30<sup>th</sup> June 2024 to allow the completion of the pending works on some lines. The progress of the project was affected when the funder halted works for the grid extension lines in October 2022 due to contractors undertaking works before PAPs were compensated. The loan period for this project expired and the remaining works are being completed using GoU funding.

The completed lines under the project were Line 1 (Mubende), Line 2(Kiruhura and Mbarara), Line 11(Gomba and Butambala), Line 18 and 19 (Ibanda and Ntoroko). Works on the following lines were at different levels of implementation and progress is summarized in Table 3.6.

Line	Status
Line 1 (Mubende)	Completed
Line 2 (Kiruhura and Mbarara)	
Line 3 (Terego, Yumbe, Koboko and Moyo Districts)	Completion level - 87.7%; PAP Compensation – 97.19%
Line 4 (Arua and Nebbi Districts)	Completion level - 95%; PAP Compensation – 97.19%
Line 13 (Masaka, Rakai, Kyotera, Lwengo and Lyantonde Districts)	Completion level – 88.9%; PAP Compensation – 91.36%
Line 15 (Kamwenge and Kitagwenda Districts)	Completion level – 99.3%; PAP Compensation – 97.8%
Line 16 (Ntungamo and Rwampara)	Completion level – 64.4% PAP Compensation – 95.61%



Line	Status
Line 17 (Kanungu and Rukungiri Districts)	Completion level – 83.4% PAP Compensation – 91.58%
Line 21 (Kalaki, Soroti, Amuria, Dokolo and Kaberamaido Districts)	Completion level – 95%; PAP Compensation – 95.3%
Line 12 (Mukono District)	Completion level – 89.8%; PAP Compensation – 76.5%
Line 14 (Mubende, Kibaale and Kagadi Districts)	Completion level – 71.7%; PAP Compensation – 70.67%
Line 20 (Kole, Lira, Agago, Alebtong and Otuke Districts)	Completion level – 54.4%; PAP Compensation – 89.7%

Source: MEMD Q2 Reports

### Bridging the Demand Supply Gap through the Accelerated Rural Electrification Programme (BDSGAREP)

Under Bridging the Demand Gap through the Accelerated Rural Electrification Programme (BDSGAREP)<sup>3</sup>, the government was targeting to electrify a total of 287 sub-county headquarters and surrounding areas in all the regions of the country.

The total contract sum for the project is USD 212,669,840.08 with USD 133,219,483.75(76%) disbursed by the end of 31<sup>st</sup> December 2023. The budget for FY2023/24 is Ug shs 91.97bn, while the release was Ug shs 99.62bn, and expenditure Ug shs 63.04bn. The project got supplementary GoU funding of Ug shs 48.96bn.

A total of 6,598.12km of low voltage distribution lines and 3,162.92km of medium voltage distribution lines had been constructed, and a total of 1,666 transformers were installed on the completed networks. Works on the 11kV distribution schemes under the project totalling 310km of medium voltage lines, 798 low voltage lines, and 179 distribution transformers had not yet commenced due to delays in reviewing the contractor's proposed costs.

**Table 3.8: Progress of BDSGAREP as at 31<sup>st</sup> December 2023**

Region	Parameters	Length (km)		Stringing		Tx Installation
		MV	LV	MV (Km)	LV (Km)	
Eastern Region	Approved As-pegged Scope	1,088.72	3,064.58	1,088.72	3,064.58	700
	As-Built Scope	1,088.72	3,064.58	954.66	2,734.37	567
	%ge progress	100.00%	100.00%	87.69%	89.22%	81.00%
Central Region	Approved As-pegged Scope	926.65	1,673.85	926.65	1,673.85	480
	%ge progress	100.00%	100.00%	81.74%	78.97%	81.25%
South Western Region	Approved As-pegged Scope	731.78	1,711.76	735.17	1,750.37	475
	As-Built Scope	731.78	1,711.76	685.09	1,586.97	418
	%ge progress	100.00%	100.00%	93.19%	90.66%	88.00%
Northern Region	Approved As-pegged Scope	788.08	989.55	774.98	959.69	297

<sup>3</sup> Funding by a USD 212.669 million loan from China-EXIM Bank



	As-Built Scope	788.08	989.55	765.74	954.95	291
	%ge progress	100.00%	100.00%	98.81%	99.51%	97.98%
Overall Total	Approved As-pegged Scope	3,535.23	7,439.73	3,525.52	7,448.49	1,952
	As-Built Scope	3,535.23	7,439.73	3,162.92	6,598.12	1,666
	%ge progress	100.00%	100.00%	89.71%	88.58%	85.35%

Source: MEMD Q2 Reports

## Uganda Rural Electricity Access Project

Under the Uganda Rural Electrification Access Project (UREAP)<sup>4</sup>, the scope is to construct a total of 1,427km of medium voltage lines, 1,170.7km of low voltage lines, installation of 500 transformers, and a 33kV submarine cable connection to Bugala Island in Kalangala District and 10,739 last mile connections at commissioning.



One of the two installed switching station for Bugala marine cable at Bukakata

The project consists of Lots 1-7 and Lots 10-13 for additional works. Lot 9 is for the supply of last-mile connection materials (meters and service cables).

The project financing mix is comprised of a loan of USD 100 million and a grant of Euro 11.205 million. The disbursement rate of the funds stood at 83.76% for the loan and 96% for the grant. The total budget for the project during

FY2023/24 is Ug shs 27.69bn, with Ug shs 20.284bn released and Ug shs 20.074 b spent.

The overall progress of UREAP stood at 90% for Lots 1-7 and 90% for the additional Lots 10-13. The total length of lines constructed under the project was 1,780.6 km for MV and 2,646.53km for LV, and cumulatively 99,077 connections were completed within the UMEME service territory. Works on all the lines were on schedule and completed but the planned connections on the newly constructed lines had not commenced due to late delivery of the necessary connection materials (meters and cables). The long-delayed installation of the 7km marine cable from Bukakata to Bugala Island under Lot 6 was also finally completed and the testing of the system was ongoing.

## Electricity Access-Scale up Project (EASP)

The project's total financing is USD 638 million, which includes an IDA loan of USD 331.5 million, an IDA grant of USD 112.5 million, and GoU funding of USD 10 million. The rest of the financing is from a number of grants. The project consists of 4 components:

<sup>4</sup> Jointly funded by GoU and African Development Bank (AfDB)



1. Grid Expansion and Connectivity to scale up of last-mile national grid and mini-grid connectivity under the Electricity Connections Policy.
2. Financial Intermediation for Energy Access Scale-up to support the Uganda Energy Credit Capitalization Company (UECCC) scale-up and expand the scope of its existing line of credit facility.
3. Energy Access in Refugee Host Communities to support the provision of energy access in Refugee Host Districts.
4. Project Implementation Support and Affordable Modern Energy Solutions to finance the establishment and operations of the Project Coordination Unit (PCU) at the MEMD, and the PIUs at MEMD and UECCC.

The project became effective in July 2023 and the budget for FY 2023/24 is Ug shs 84.501bn, while the release was Ug shs 75.02bn and expenditure was Ug shs 13.331bn. The project had commenced procurement of consultants to undertake the design of the planned grid extensions and also for independent verification of the free connections. The overall performance of the Transmission and Distribution Sub-programme is summarized in Table 3.9.

**Table 3.9: Performance of the Transmission and Distribution Sub-programme by 31<sup>st</sup> December 2023**

Intervention	Output	Annual Budget (Ug shs)	% of budget received	% of budget spent	Annual Target	Cum. Achieved Quantity	physical Score (%)	Remarks
Expand and Rehabilitate the Transmission Network	Distance in km of high voltage lines added to the transmission grid	284	24.4	100	2250	1800	80.00	Agago-Gulu and Kole - Gulu T-Lines energized.
	Transformation capacity added to the grid (MVA)	189	24.4	100	155	100	64.52	
Expand and Rehabilitate the Distribution Network	No. of km of medium voltage lines added to the grid	214	69.9	55	857	700	81.73	UREAP Lots 1-12 completed.
	No. of km of Low voltage lines added to the grid	92	69.9	55	959	700	73.03	



Intervention	Output	Annual Budget (Ug shs)	% of budget received	% of budget spent	Annual Target	Cum. Achieved Quantity	physical Score (%)	Remarks
Reduce End User Tariffs	No. of last-mile connections made	8	41.6	40	150000	12478	8.32	Low rate of connections under the free connections policy.
							<b>52.7</b>	<b>Overall performance</b>

Source: Field Findings and MEMD Q1&2 Reports

### Sub-programme challenges

- Delayed completion of transmission and distribution infrastructure as a result of RoW issues due to the slow compensation process.
- Poorly undertaken feasibility studies on several projects lead to technical challenges during implementation further, driving up the costs.

### Conclusion

The progress of implementation of interventions under the sub-programme by the end of FY 2023/24 was fair at 52.7%. Several key milestones were achieved including the energization of the Gulu-Agago T-Line which enabled the evacuation of the electricity from Achwa HPP. Also, Kole-Gulu T-line was energized connecting Gulu to the transmission grid and all the schemes under UREAP were completed.

Incidents of vandalism that were derailing the progress of projects were not observed on any project. However, the programme continued to grapple with challenges arising from compensation and procurement delays.

### Recommendation

The Government should capitalize on the recently created land acquisition project to enable an early and smooth land acquisition process even before project funding can be secured

### 3.4 Renewable Energy Development Sub-programme

The objective of the sub-programme is to increase the adoption and the use of clean energy with an intermediate outcome of increased consumption of alternative clean cooking energy. The planned interventions under the sub-programme in FY2023/24 was increased promotion use of new and renewable energy solutions.



## Performance

The overall performance was fair at 50%. The sub-programme had a total budget of Ug shs 1.878bn, of which Ug shs 0.986bn (52.5%) was released and Ug shs 0.638bn (33.9%) spent by 31<sup>st</sup> December 2023.

The planned outputs under the intervention are: increased deployment of new renewable energy solutions; off-grids based on renewable energy solutions promoted; development of grid-connected renewable energy systems; net metering framework developed and technical capacity in renewable energy solutions developed; increased uptake of improved cook stoves.

**Table 3.10: Performance of Interventions under the Renewable Energy Development Sub-programme by 31<sup>st</sup> December 2023**

Intervention	Performance rating	Remarks
Promote the use of new and renewable energy solutions		Fair performance of 50%. The construction of the solar arrays for 15 mini-grids stalled. 10 sites were identified for the installation of institutional cook stoves.
<b>Average output performance</b>		<b>Fair performance of 50 %</b>

*Source: Author's Compilation*

### Increased deployment of new renewable energy solutions

The monitoring of the 6 mini-grids in Kasese and Rubirizi under the WWF /EU project and currently in the process of transferring operations to another developer. Carried out surveys and technical studies of the islands on Lake Victoria for the development of mini-grids in Buvuma, Kalangala and Wakiso districts.

The procurement of a consultant to support the development of standards for institutional biomass cooking stoves and biogas was ongoing and the World Bank had given clearance for the bidding process to begin. The procurement of the 15 solar water pumping demonstration systems was ongoing and drafting of specifications was completed.

The Renewable Energy Conference 2023 and expo was held at Speke Resort Munyonyo from the 18<sup>th</sup> -20<sup>th</sup> November 2023. The conference attracted policymakers, the private sector, and academia among others to help promote the use of renewable energy technologies that are available on the market.

### Off-grids based on renewable energy solutions promoted

Works on the 15 planned mini-grids in Southern Uganda had stalled, although the works on the distribution networks were completed. MEMD is procuring another implementing partner after the departure of the previous developer - Winch Energy.

### Net metering framework developed

Grid interconnection of the 516KW solar plant at Kololo Ceremonial grounds is in process and the licensing process on the net metering basis embarked on technical meetings with the utility



operator (UMEME) and the Electricity Regulatory Authority held. The Electricity Regulatory Authority was undertaking consultations with stakeholders on the draft framework for net metering.

### Technical capacity in renewable energy solutions developed

Two staff were trained in Wind Energy. The training covering policy, technology and project development aspects of wind energy was organised by India's Ministry of New and Renewable Energy (MNRE), under the Indian Government's Technical and Economic Cooperation (ITEC) Programme.

### Increased uptake of improved cook stoves

Site identification for regional product development and demonstration centres for improved cookstoves was conducted in Eastern and Northern Uganda. Potential sites included vocational training institutions, schools, and universities. The ten (10) sites were identified and the procurement was initiated for five (5) sites that include: 1. Rwantsinga High School, Rubaya Sub-county, Kashaari County in Mbarara District, 2. Nyakasura School Nyakasura School Kabarole District, 3. St. Michael High School Rugazi, Rubirizi District, 4. Bukedi College, Kachonga Kapisa Parish, 5. Mother Kevin Senior Secondary School, Walukuba, Jinja City. The performance of the outputs under the Renewable Energy Development Sub-programme is summarized in Table 3.11.

**Table 3.11: Performance of the Renewable Energy Development Sub-programme by 31<sup>st</sup> December 2022/23**

Planned Output	Annual Budget ( Ug shs)	% of budget received	% of receipts spent	Semi-Annual Target	Cum. Achieved	Physical Performance (%)	Remarks
Increased deployment of new renewable energy solutions	0.38	52.5	64.7	50.0	40.0	80	Procurement of 15 solar pumping systems was ongoing.
Off-grids based on renewable energy solutions promoted	0.27	52.5	64.7	100.0	40.0	40	Works on the 15 mini-grids in the south stalled.
Net metering framework developed	0.27	52.5	64.7	100.0	50.0	30	
Technical capacity in renewable energy solutions developed	0.27	52.5	64.7	5.0	2.0	40	2 officers trained in wind energy
Increased uptake of improved cook stoves	0.27	52.5	64.7	100.0	60.0	60	10 institutions selected for institutional cook stoves



Planned Output	Annual Budget ( Ug shs)	% of budget received	% of receipts spent	Semi-Annual Target	Cum. Achieved	Physical Performance (%)	Remarks
Total	1.45					50.00	Overall performance

Source: Field Findings and MEMD Q4 Reports

### Challenge

The main hindrance to the sub-programme performance is the low budget allocation. The sub-programme activities have remained at a scale that will not have a significant impact due to the low level of funding.

### Conclusion

The sub-programme continues to struggle to deploy and promote renewable energy solutions on a large scale due to funding constraints. The ambitious planned installation of 15 solar mini-grids in Rakai and Isingiro stalled, and the MEMD was yet to get another developer to complete the project. However, the Renewable Energy Conference was successfully held in November 2023 bringing together stakeholders in the renewable energy sector to promote participation in the field.

### Recommendation

The MEMD should allocate more funding in the Medium-Term Expenditure Framework (MTEF) for the implementation of the sub-programme activities such as increased use and deployment of renewable energy to reduce the reliance on biomass.

## 3.5 Energy Efficiency and Conservation Sub-programme

This sub-programme aims at promoting energy-efficient practices and technologies. The planned intervention under this sub-programme in FY2023/24 is the promotion of the use of energy-efficient equipment for both industrial and residential consumers. The planned outputs are: utilization of alternative and efficient cooking techniques; promotion of energy management among high energy consuming facilities; awareness of sustainable energy and sustainable energy created; and complementary policies on energy efficiency developed.

### Performance of the Intervention

The sub-programme performance was fair at 55% (Table 3.12). The sub-programme was poorly funded with a total budget of Ug shs 2.413bn, of which Ug shs 1.231bn was released and Ug shs 0.670bn spent by the 31<sup>st</sup> December 2023.





**Table 3.12: Performance of Interventions under the Energy Efficiency and Conservation Sub-programme by 31<sup>st</sup> December 2023**

Intervention	Performance Rating	Remarks
Promotion of efficient equipment for both industrial and residential consumers		Fair performance of 55%. Two energy efficiency standards were drafted
<b>Average output performance</b>		<b>Poor performance of 55%</b>

*Source: Author's Compilation*

### Utilization of alternative and efficient cooking techniques

The consultant was hired to prepare a strategy and action plan to accelerate the penetration of eCooking in Uganda's cooking mix. Site identification for regional product development and demonstration centres was conducted in Eastern and Northern Uganda. Potential sites included vocational training institutions, schools, and universities.

### Promotion of Energy management among high energy-consuming facilities

Preliminary data about electricity consumption for consumers served by Umeme Limited was obtained.

### Minimum Energy Performance standards developed

Surveillance testing of lighting appliances was conducted in partnership with the Uganda National Bureau of Standards (UNBS) and the market survey preliminary data collection was initiated. The survey seeks to obtain data on appliances imported into the country.

### Electric Mobility Promoted

Stakeholders for the master plan development were identified for Kampala Metropolitan. Stakeholder entities included the Kampala Capital City Authority (KCCA), and the municipalities of Mukono, Entebbe, Kira and Nansana. Existing standards for Electric Vehicle Supply Equipment (EVSE) were identified and analysed for adoptability. Energy policy provisions for electric vehicle charging were also assessed. The procurement of pilot charging infrastructure commenced with the development of specifications. The performance of the Energy Efficiency and Conservation Sub-programme is summarized in Table 3.13.

**Table 3.13: Performance of the Energy Efficiency and Conservation Sub-programme by 31<sup>st</sup> December 2023**

Output	Annual Budget (Ug shs)	% of budget received	% of receipts spent	Semi-Annual Target	Cum. Achieved	Physical Performance (%)	Remarks
Utilization of alternative and efficient cooking techniques	2.103	15.5	53.2	50.0	30.0	60.000	Sites for 6 demonstration centres were identified.



Output	Annual Budget (Ug shs)	% of budget received	% of receipts spent	Semi-Annual Target	Cum. Achieved	Physical Performance (%)	Remarks
Promotion of Energy management among high energy-consuming facilities	2.103	15.5	53.2	50.0	30.0	60.000	Data on all energy consumers collected
Minimum Energy performance standards developed	2.103	15.5	53.2	50.0	30.0	60.000	UNBS and MEMD conducted a preliminary survey.
Electric mobility promoted	2.103	15.5	53.2	50	20.0	40.000	Procurement of pilot charging infrastructure ongoing.
<b>Total</b>	<b>8.41</b>					<b>55.00</b>	<b>Overall performance</b>

Source: Field Findings and MEMD Q4 Reports

### Challenges

- i) Small and medium enterprises lack access to energy-efficient equipment due to the high initial acquisition costs.
- ii) The consistent low-budget MTEF allocations to the programme have hindered the large-scale implementation of projects that have a significant impact.

### Conclusion

Overall performance of the sub-programme was fair at 55%. Although there is a need to optimize the use of energy in homes and enhance efficiency by the industries to save on costs, the level of funding to the sub-programme currently is not adequate for the interventions to have a high impact. Several standards have been developed over the years so that energy consumers are exposed to efficient technologies but the scaling up of existing interventions needs to be done so that there is increased coverage to have an impact.

### Recommendations

- i) The MEMD should support industrial and domestic energy consumers to enable them to access the most efficient technologies to tie in with the planned energy efficient standards.
- ii) The Electricity Regulatory (ERA) should model the tariff so that there are incentives for those high energy-consuming industries that embrace energy-efficient machines and processes.



## CHAPTER 4: CONCLUSION AND RECOMMENDATIONS

### 4.1 Programme Conclusion

The overall performance of the Sustainable Energy Development (SED) Programme was fair at 58.9%. Universal access to electricity remains one of the Government's priorities, the level of access throughout the country increased with the completion of several rural grid extension schemes under the rural electrification. The Government has also made progress in extending the transmission grid to areas that previously were not connected such as Northern Uganda, and works to connect the West Nile region are in the final stages of completion. Completion of works at Karuma HPP was in the final stages with five of the six generation units successfully synchronized to the electricity on the grid.

Implementation challenges due to inefficiency in procurement, and difficulty in acquisition of RoW/wayleaves continued to hamper the ongoing power projects. An emerging issue in the sector are the poorly undertaken feasibility studies which lead to serious unexpected technical challenges, this needs to be addressed going forward. On a positive note, the previously rampant cases of vandalism on the ongoing power projects have been controlled due to the vigilance of the security agencies which has enabled better project performance.

### 4.2 Recommendations

- i) The programme-implementing institutions should undertake better due diligence during the procurement process to prevent the firms that lack the required financial capacity from being awarded the contracts.
- ii) The land acquisition project under MEMD should be adequately capitalized to enable the early kick-start of land acquisition before the negotiation of financing for the projects can commence.
- iii) The programme-implementing agencies should conduct a more thorough review of the technical aspects of feasibility studies in the lead-up to the implementation of projects. This will avoid design delays due to unforeseen site environmental, geological and geotechnical conditions.



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## ANNEX

### Annex 1: Interventions, Outputs and Implementing Agencies

Intervention	Output	Implementing Agency
Undertake preliminary development of large-generation plants	Construction of Nyagak III HPP	UEGCL, MEMD
	Construction of Karuma HPP	
Seek approvals for the construction of a nuclear power generation	Energy policy, plans, regulation and monitoring	MEMD
	Atomic energy promotion and coordination	MEMD
	Membership to IAEA	MEMD
Expand and Rehabilitate the Transmission Network	Distance in km of high voltage lines added to the transmission grid.	UETCL
	Capacity of transformer capacity (MVA) added to the grid	
Expand and Rehabilitate the Distribution Network	No. of km of medium voltage lines added to the grid	MEMD
	No. of km of low voltage lines added to the grid	MEMD
Reduce End User Tariffs	No. of Last-mile connections made	MEMD
Promote the use of new and renewable energy solutions	Increased deployment of new renewable energy solutions	MEMD
	Off-grids based on renewable energy solutions promoted	
	Net metering framework developed	
	Technical capacity in renewable energy solutions developed	
Promote the use of energy-efficient equipment for both industrial and residential consumers	Utilization of alternative and efficient cooking techniques	MEMD
	Promotion of Energy management among high energy-consuming facilities	
	Minimum Energy performance standards developed	
	Electric mobility promoted	
	Utilization of alternative and efficient cooking techniques	

*Source: Author's Compilation*







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