

End-review of Norwegian Support to Rural Electrification Projects in Uganda

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REPORT

CLIENT
NORAD

SUBJECT
End-review of Norwegian Support to Rural
Electrification Projects in Uganda (UGA 3049
10/0021 and 10/0039)

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REPORT

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CLIENT	Norad	PROJECT MANAGER	Joakim Arntsen
CONTACT	Elisabeth Clemens, Norad	PREPARED BY	Irene Koksæter, Geofrey Bakkabulindi, Ingar Flatlandsmo, Joakim Arntsen

SUMMARY

The end review of two rural electrification programs implemented by the Rural Electrification Agency (REA) in Uganda during the period 2010-2014 with financial support from the Norwegian Embassy (UGA-10/0021 and UGA-10/0039) has established that the projects have over-achieved on the number of connections and achieved their purpose and objectives. However, the review also reveals several shortcomings in quality, progress and documentation, and establishes that there is room for improvement related to (i) quality of the implementation, (ii) inclusion of cross-cutting issues, (iii) cost-efficiency of some projects, and (iv) long-term sustainability with regard to operation and maintenance.

Specifically, the end review has established the following:

- **Progress.** All eight project were constructed as planned, commissioned and handed over to the respective grid operators. The projects had been in operation between 5 to 7 years at the time of the review. However, one contract was formally not yet completed. REA still retained payment to the Contractor of the Apala-Kiru project due to an outstanding technical issue.
- **Implementation.** Several shortcomings in quality, progress and documentation during construction were documented by the Monitoring Consultant. Construction supervision was generally insufficient with limited site presence and follow up of Contractors, as well as limited documentation provided by Supervision Consultants. The program monitoring confirmed that contracts were procured competitively in a fair and transparent manner. REA has provided annual reports as per the agreements, but not submitted final reports for the two agreements.
- **Monitoring.** The setup with independent monitoring of procurement, implementation and financial management was an effective measure to reduce reputational-, financial- and other compliance risks. There was overlap, however, between the role of the Supervision Consultant and Monitoring Consultant, with the latter also doing technical project supervision. Technical advice from the Monitoring Consultant was to a lesser degree followed up during project implementation by the Contractor at site.
- **Environment and climate.** The National Environment Management Authority (NEMA) approved REA's Environmental and Social Management Plan (ESMP) in 2010. The plan also included occupational health and safety issues. REA included implementation/supervision of the ESMP in the various contracts. Despite the planning, the end review has not been able to verify to what degree the ESMP was implemented during construction. Both annual and monitoring reports document environmental and social performance vaguely.

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- **Gender and women's rights.** Gender planning was integrated from the initial project planning and an international consultant was hired to identify concrete possibilities for integration of gender activities in the projects. REA established an internal task team. Despite extensive planning at the onset of the project, the results and monitoring reports reviewed reflected no gender-specific activities undertaken during implementation.
- **Wayleave compensation.** Despite a relatively timely property valuation process, payment of compensation was significantly delayed. REA finally received budget for compensation payments from the Ministry of Finance in June 2018 (Financial Year 2017/18) and started making payments in February 2019. At the time of the review, 85% of the more than 14,500 people entitled to compensation had been paid. Both the valuation and payment processes appear to have been executed in a structured and orderly manner. However, the lack of prompt compensation payment was a source of discord and tension between claimants and grid operators.
- **Financial management.** Through regular monitoring in the 2012 to 2016 period, the Monitoring Consultant concluded that REA's financial management was satisfactory. REA confirms that there have been no movements on the project grant account since end of 2016. The Agency has not paid the retention fee to the Contractor for Apala-Kiru which amounts to USD 300,987. All other projects have been closed off and retention fees paid. It is recommended that the Embassy requests a final financial statement for both agreements, and requests repayment of any unspent disbursed funds.
- **Relevance.** The projects were considered highly relevant and in line with both governing principles of Norwegian energy development assistance, as well as Ugandan strategies and plans, at the time of planning and implementation.
- **Achievement of the overall Goal.** To assess the overall Goal of the program (improve economic and social development) an impact level analysis is required. A socio-economic baseline study was carried out in 2014 to establish a baseline against which results and impacts of the electrification could be measured. Unfortunately, the end review concludes that the errors and inconsistencies of the baseline study are so fundamental and substantial that it cannot be used for analytical purposes. However, site observations and interviews indicated that there have been some positive developments with businesses, job creation and growth in the electrified villages.
- **Achievement of Purpose.** The end review has established that the Purpose of the program (extend power to district headquarters, businesses, production units and households) has been accomplished. The projects have been constructed according to the plans and overachieved on the planned number of customer connections.
- **Customer connections.** Overall the projects have had a high uptake of new connections and the overall long-term customer connection goal has been achieved with more than 24,000 connections achieved 5 to 7 years after commissioning of the lines. The only project that has not achieved its connection target is the Rackoko-Lalogi line operated by PACMECS.
- **Unit costs.** Five of the eight rural electrification projects have relatively cost-efficient costs per connection, both compared to similar projects in Mozambique and benchmarked against World Bank data, 5-7 years after commissioning. However, three of the projects are very costly due to a low number of connections compared to the total investment cost. The Kabale-Kisoro line in the far south (USD 3,155), as well as the two northern projects Apala-Kiru (USD 3,854) and Rackoko-Lalogi (USD 7,387), have significantly higher connection unit costs.
- **Cost-benefit analysis.** A simplified cost-benefit analysis (CBA) has been conducted, based on data collected during the field visit and from other comparable projects in the region and projections based on our experience. Year-by-year connection data were unfortunately only available for three of the eight projects and the CBA had to be limited to these three projects. The Gulu-Adjumani-Moyo line is found to be economically beneficial, with an IRR of 18% (well above the 10 % shadow cost of capital assumed for Uganda). With an IRR of 12 percent, the economic performance of the Mubende-Kyenjojo line is also found to be positive given the applied assumptions. However, the Rackoko-Awere-Lalogi line is found to be a poor investment from an economic perspective with an IRR of only five percent (i.e. the resources invested in this project would have been better spent on other development projects). It is concluded that without far greater efforts to increase the number of connections, an investment of this size cannot be justified in scarcely populated areas of Northern Uganda.

- **Cost efficiency.** Competitive procurement is necessary to assure cost-efficiency in construction projects. It has been established that the contractor procurements were conducted in a fair and transparent manner. It is likely that the technical supervision and monitoring could have been more cost-efficient with more clarity around roles and responsibilities of the Supervision and Monitoring Consultants.
- **Sustainability.** Major sustainability concerns for the projects relate to operation and maintenance, including (i) low number of connections and low electricity consumption creating a small revenue base for the grid operator, (ii) high level of equipment failures and outages on the lines for several possible reasons (quality, operation and maintenance), and (iii) vulnerable governance structures of the cooperatives. Lack of sustainability appears to be a more critical issue in the northern projects with few customers on lines operated by PACMECS.
- **Future support.** To ensure cost-efficient and sustainable electrification, future Norwegian support to rural electrification in Uganda could consider:
 - i. Off-grid alternatives to grid electrification in rural areas with a low population density.
 - ii. Strengthening of results in areas that have already been electrified with Norwegian support, rather than expansion in new areas, through inclusion of more load centres, connection of additional customers, and possibly capacity building to the local grid operators to strengthen operation and maintenance.
 - iii. A holistic approach to rural electrification including implementation of development initiatives to stimulate productive use of electricity and job creation in parallel with the rural electrification.

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1 Introduction

This is the end review of two rural electrification programs implemented by the Rural Electrification Agency (REA) in Uganda in the period 2010-2014 with financial support from the Royal Norwegian Embassy in Kampala (the Embassy).

1.1 Background

The agreement for construction of *two rural electrification projects* (UGA-10/0021) was signed between the Norwegian Embassy and the Uganda Ministry of Finance, Planning and Economic Development (MoFPED) on 4th June 2010, and agreements for construction of *six rural electrification projects* (UGA-10/0039) were signed 29th July 2011 and 6th December 2011. Under each agreement several addenda were subsequently agreed and signed, as presented in the two tables below.

Table 1 Overview of agreement and addenda for UGA-10/0021

UGA-10/0021 Two Rural Electrification Projects			NOK 46.7 million
04.06.2010	Agreement	Two rural electrification projects	NOK 35.1 million
05.08.2011	Addendum 1	Extension of scope	NOK 1.6 million
28.06.2012	Addendum 2	Connection subsidy	NOK 10 million
19.11.2014	Addendum 3	No-cost extension until 2015. Utilization of outstanding balance funds (NOK 2.3m)	

Table 2 Overview of agreement and addenda for UGA-10/0039

UGA-10/0039 Six Rural Electrification Projects			NOK 196 million
29.07.2011	Agreement	Three rural electrification projects in South-West	NOK 112 million
06.12.2011	Addendum 1	Three rural electrification projects in North	NOK 84 million
	Addendum 2	No-cost extension until 2015. Utilization of unused funds (NOK 12.4m) for additional scope	

The overall objectives of the two programs were similar. The Goal was to “meet the rural population’s need for improved economic and social development in a sustainable way through increased access to affordable electricity services”. The Purpose was “to extend power from the national grid to district headquarters, administrations, businesses, production units, and households, not yet served by the grid”.

The figure below shows the location and scope of the projects.

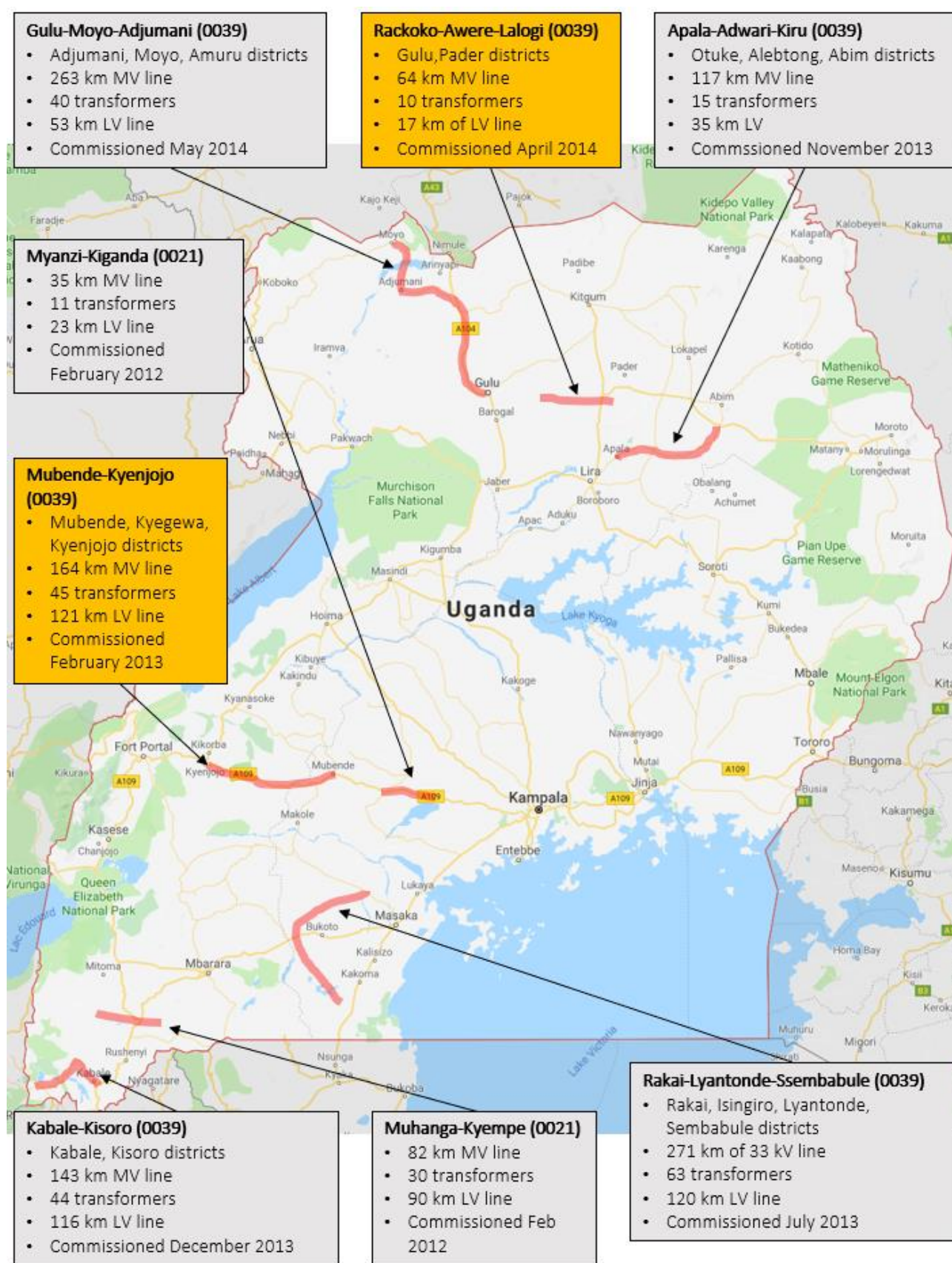


Figure 1 Project locations and key data (the two projects with orange text boxes were visited by the Consultant)

Initial customer connections were also part of the scope. This is presented and discussed in detail in chapter 4. More detailed project data is found in Annex A.

1.2 Report purpose and scope

The purpose of this end review, as stated in the Terms of Reference, is to “assess whether the projects have fulfilled objectives set in the Agreements with Addenda including the financial management of the projects”.

The Terms of Reference specify that the following issues under Scope of Work are the most important to assess:

- Relevance and impact
- Effectiveness and cost efficiency
- Particular technical issues

This was further discussed and elaborated in the kick-off meeting between Norad and the Consultant on 7th August 2019, where it was agreed that the end review should give particular attention to the assessment of:

- **Connections.** Collect as much connection data as possible and analyze the development of new connections in all the projects since their commissioning. Use the connection data as basis for a simplified cost-benefit consideration of projects.
- **Sustainability.** Sustainability in rural electrification projects is related to sound operation and maintenance of the infrastructure to ensure security and quality of electricity supply, as well as maximizing the technical lifespan of the assets. Collect data and assess handling of operation and maintenance in the two projects visited.
- **Wayleave compensation.** Timely payment of compensation to landowners for loss of land and crops is a key contractual obligation of REA in the Agreement with the Norwegian Embassy. Collect data and check how compensation payments have been handled in the projects.

The Terms of Reference call for an assessment of project impacts using the Baseline study from 2013 as point of departure. It was, however agreed in the kick off meeting that impact level considerations will be limited and mainly covered through a simplified cost-benefit analysis applying connections numbers and other data gathered during the short field assessment. This will give high-level indications, rather than a detailed picture of the long-term effects of the electrification projects.

1.3 Methodology and report structure

This review has been conducted partly as a desk study, and partly through a field visit to Uganda. The following workflow steps have been followed: 1) Preparation, 2) Desk Review, 3) Interviews and Field Work, and 4) Data Analysis and Reporting. The review is based on the OECD Development Assistance Committee's (DAC) definitions of efficiency, effectiveness, relevance and sustainability of development assistance.

The report is structured with a summary of the field visits and observations (chapter 2), review of design/ implementation and review of results in separate chapters. The following aspects have been examined in chapters 3 and 4:

- Progress on activities and outputs
- How well the projects are suited to priorities (relevance)

- The extent to which the projects have achieved objectives (effectiveness), and major factors influencing implementation
- Whether project implementation has been cost-efficient
- The likelihood of sustaining the benefits of the projects after the donor funding is withdrawn (sustainability)

Finally, chapter 5 presents key conclusions and recommendations for future Norwegian support to rural electrification in Uganda.

During and after the visit to Uganda, the Consultant conducted a number of interviews with key stakeholders. Preliminary findings were presented and discussed with the Embassy representatives in a wrap-up meeting before leaving Uganda. A list of people met can be found in Annex C, while semi-structured interview guides are presented in Annex D. Annex E contains a list of documents reviewed.

2 Site Visit Summary and Observations

The ToR called for the Consultant to visit two of the eight projects. The Mubende – Kyenjojo project in Western Uganda and the Rackoko – Awere – Lalogi project in Northern Uganda represent extremes in terms of project viability prior to implementation and were therefore selected for site visits. According to feasibility studies and project appraisals, the Mubende – Kyenjojo line was the most beneficial project in terms of financial and economic returns, whereas the Rackoko – Awere – Lalogi project had one of the lowest modelled returns. Additionally, the projects were located in areas with vastly different social and economic characteristics. On this basis the two projects were expected to represent a balanced sample of the total portfolio.

The general structure of the field visits comprised i) meetings with utilities responsible for the operation and maintenance of the distribution lines, ii) meetings with electricity end-users and connected customers in the project areas with focus on commercial activities and small and medium enterprises, and iii) line surveys to assess the technical quality and condition of the lines. The review team was joined by a representative from REA throughout the site visits to facilitate introductions to the utilities and guide line surveys and community engagements. Representatives from the Embassy joined the visit to the northern project.

2.1 Mubende – Kyenjojo

The Mubende – Kyenjojo rural electrification project comprises 144 km of 33 kV distribution lines supplying electricity to the districts of Mubende, Kyegegwa and Kyenjojo in Western Uganda. Figure 2 shows the project map. The population of the three project districts is around 1.4 million according to the Uganda National Population and Housing Census 2014, and the main economic activity is agriculture, with most of the population depending on subsistence farming.



2.1.1 Utility information

The Mubende – Kyenjojo project is operated and maintained by the Kyegegwa Rural Electricity Cooperative Society (KRECS). The society was founded in 2012 and had 460 members at the time of the site visit. In addition to operating the Norway-funded project, the utility also operates and maintains distribution lines in other districts in the Central Service Territory, including Kayunga, Buikwe and Mityana districts. KRECS was initially a private-owned local distribution company run by residents who informally connected consumers to a domestic diesel generator. The society was formally created to manage the electrification provided by the Mubende – Kyenjojo project, with support from REA.

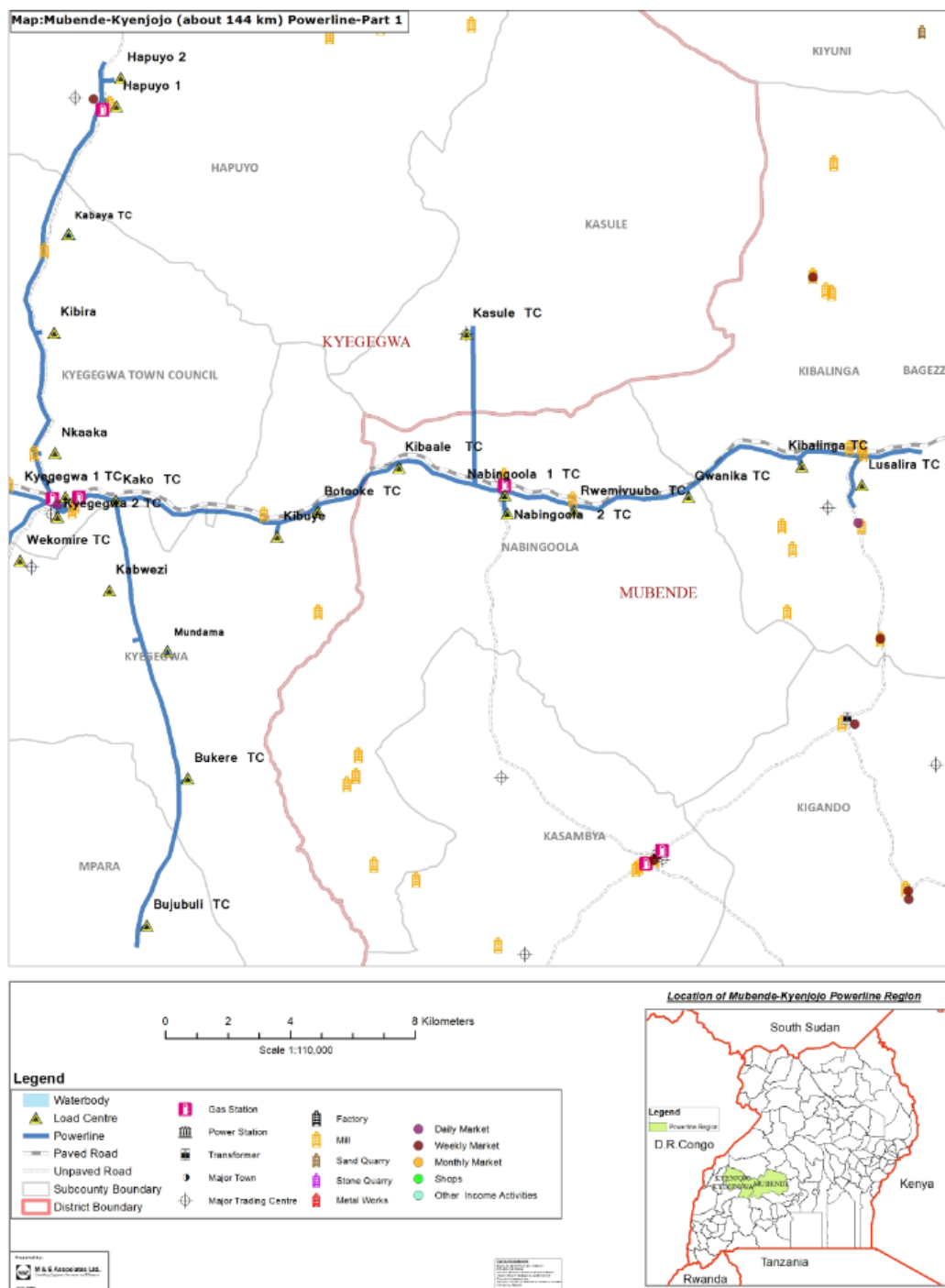


Figure 2 Mubende-Kyenjojo project map

2.1.2 *Technical Assessment*

Line data. The 33 kV medium voltage (MV) overhead distribution line from Mubende to Kyenjojo (the project) was extended from the existing 33 kV grid from Nkonge and connected to another existing grid from Rugombe in Kyenjojo village. Key technical data:

- 100 mm² Aluminium Alloy Conductor (AAAC) bare conductors
- Transformer tee-offs and low voltage (LV) reticulation networks are 50 mm² AAAC overhead conductors
- The power line construction type is BS 1320 Wood Pole Construction with vertical wiring and shield wire protection.
- All transformer tee-off structures are fitted with drop-out fuses, and a metering unit, Load Break Switch (LBS) and auto-recloser are fitted at both ends where the line connects to existing grids

The project had 45 transformer installations at commissioning, but the number had grown to 68 at the time of the site visit, due to densification efforts.

Energy Losses. Since commissioning, the project has not met the 20% energy losses target set by ERA in its distribution license. However, the utility has registered important improvements over the years through concerted loss reduction efforts. In 2015/2016, total technical and commercial energy losses of 43.7% were recorded on the KRECS network. This reduced to 24.6% by the end of July 2018. The share of technical and commercial losses in the total energy losses was not quantified by KRECS.

Measures implemented to reduce technical losses included improved load balancing along three phase circuits, improved workmanship for wiremen and connections, regular maintenance and inspections, monitoring of network power factor, improved earthing, etc. The commercial losses were mitigated through measures to curb electricity theft and vandalism. These included regular auditing of three-phase meters, facilitation of informers, assigning load security committees at all transformers, replacement of inaccurate meters, prosecution of culprits, etc.

Line quality. The quality and condition of the line as observed during the field survey was generally good. All protection equipment was operational and in good condition.

However, the network faced challenges with rotting poles that needed regular replacement. The utility reported that 120 poles had been replaced with support from REA. Given an expected wood pole life span of at least 10 years according to REA, it is clear that the poles supplied for the project during construction were substandard, probably due to inadequate seasoning and treatment. Whereas the monitoring reports raise the issue of pole treatment as input to the supervision consultant, they were mainly focused on visual inspections of the poles. More detailed checks and testing to verify time periods and methods used for pole seasoning, as well as treatment by suppliers prior to delivery, appears not to have been done.

Regarding reliability, connected customers interviewed during the site visit reported outages about three times a week for hours at a time. KRECS attributed the outages to ongoing line maintenance and pole replacements.

2.1.3 *Key Challenges*

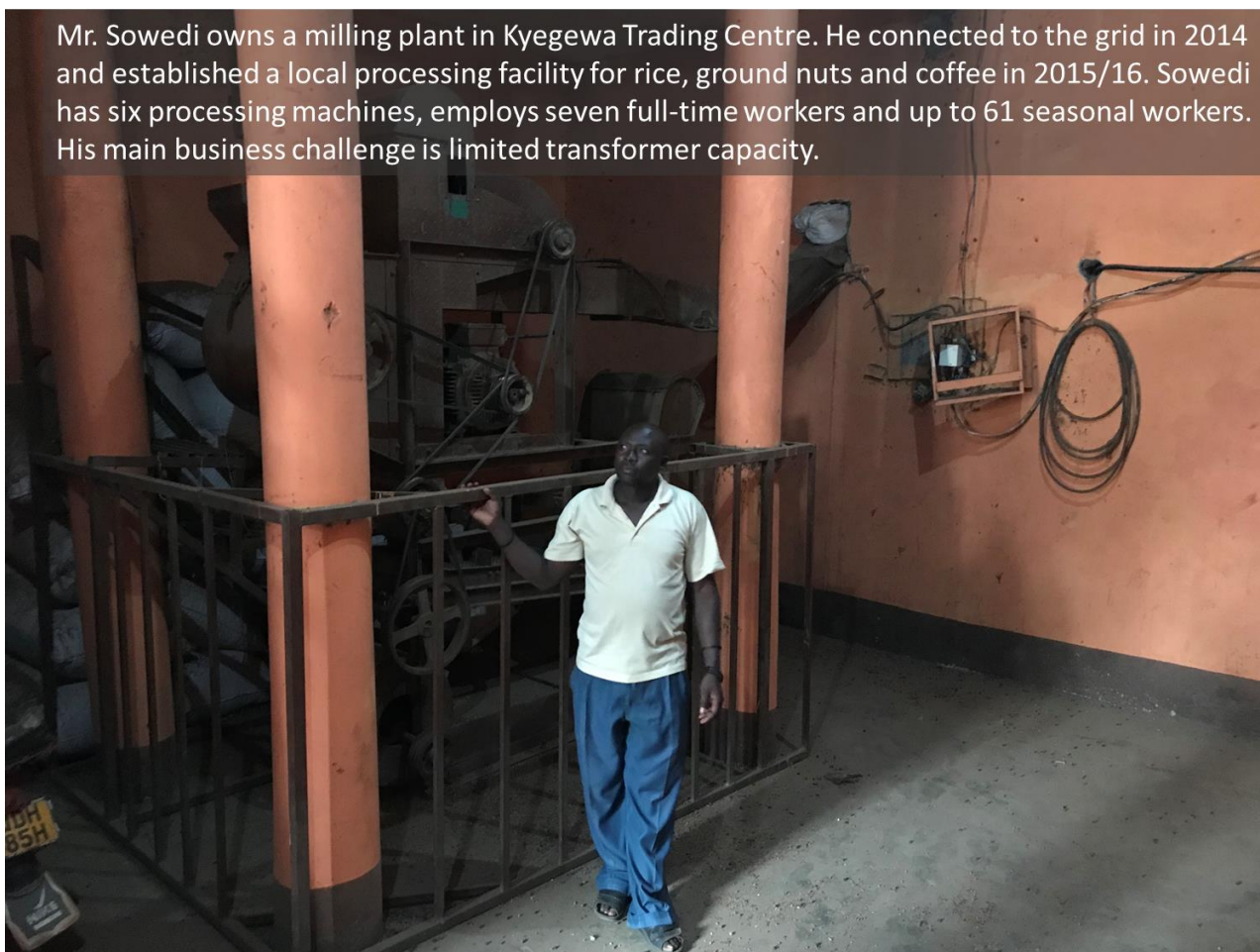
The utility reported a challenge of overloaded transformers due to high load growth. An example is the 200 kVA transformer in Kyatega trading center that needs an upgrade to at least 315 kVA to meet the demand of connected customers. The utility is constrained from investing in new transformers by regulatory

restrictions aimed at controlling tariff levels. These investments are therefore financed through REA and prone to delays.

The utility also cited limited coverage of the LV network as a key challenge. The initial LV line network had limited reach and several areas close to the MV distribution grid did not have access to electricity. KRECS was constrained from extending the network to connect prospective new customers and grow its customer base due to the regulatory investment restrictions mentioned above. Additionally, the utility has challenges obtaining commercial financing, e.g. for connection materials, due to a low credit rating as a relatively new utility.

Another challenge, reported by the utility, is vandalism of electrical equipment, e.g. the cutting of stay wires for sale to scrap metal dealers. This causes prolonged outages as new equipment is procured for replacement.

Mr. Sowedi owns a milling plant in Kyegewa Trading Centre. He connected to the grid in 2014 and established a local processing facility for rice, ground nuts and coffee in 2015/16. Sowedi has six processing machines, employs seven full-time workers and up to 61 seasonal workers. His main business challenge is limited transformer capacity.



2.2 Rackoko – Awere – Lalogi

The Rackoko – Awere – Lalogi rural electrification project comprises 67 km of 33 kV distribution lines supplying electricity to the districts of Pader and Lira in Northern Uganda. Figure 3 below shows the project map. The combined population of the two project districts is around 600,000 according to the Uganda National Population and Housing Census 2014. The northern region's economy still suffers from the effects of the war, and economic activity, especially in rural areas, remains relatively low. The main economic activity in the project areas is subsistence farming.

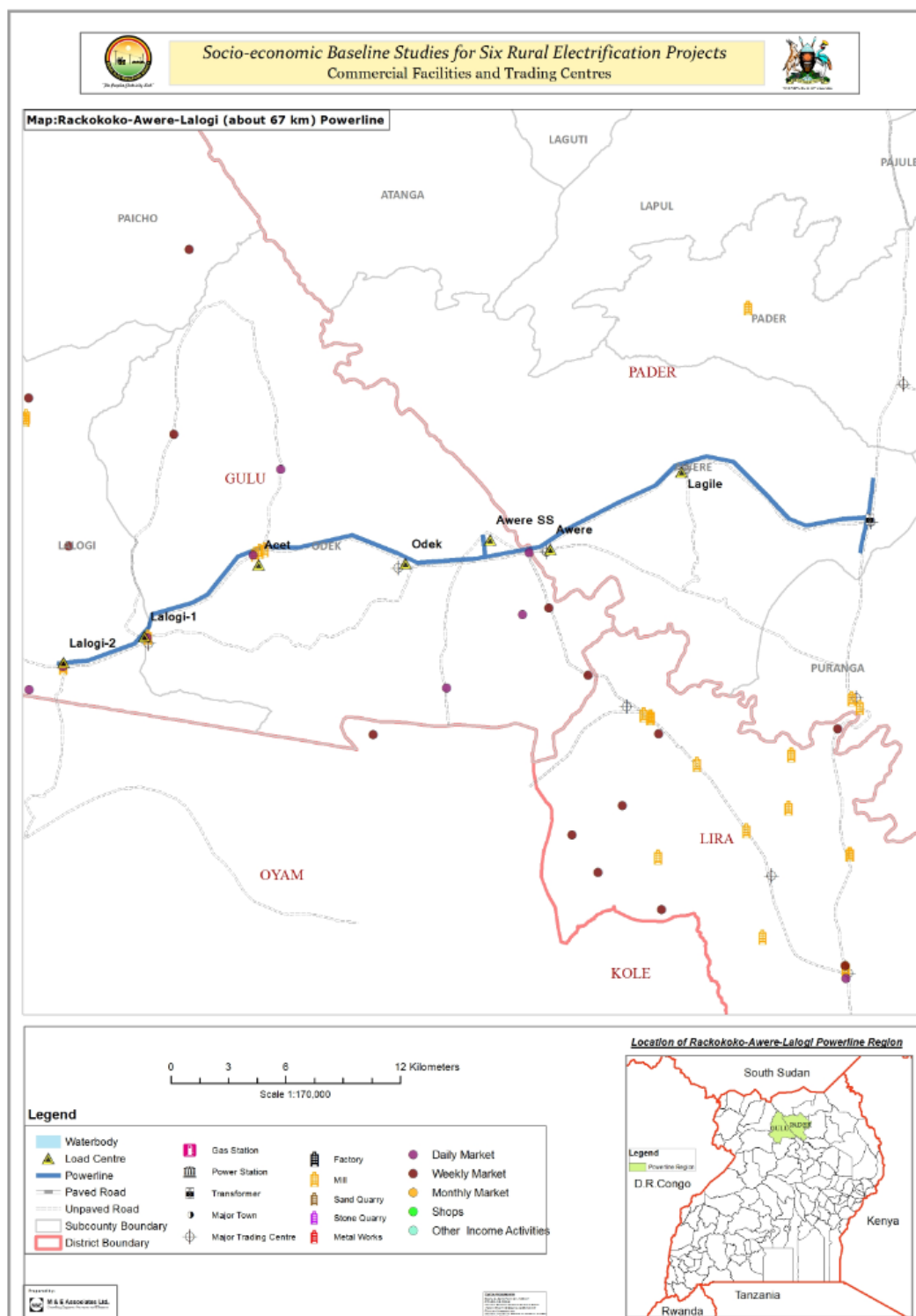


Figure 3 Rackoko-Lalogi project map

2.2.1 Utility information

The project is operated and maintained by the Pader - Abim Multi-Purpose Cooperative Society (PACMECS). The society was founded in 2008 through a community initiative of Pader and Abim aimed at resolving conflicts between the two communities. The utility's first distribution line was financed by the Swedish International Development Agency (Sida) which through REA provided a lot of the initial support to set up the society. PACMECS operated in seven districts at the time of this site visit and had recorded 4,760 connections across all its lines as of July 2019.



2.2.2 Technical Assessment

Line data. The 67 km 33 kV MV overhead distribution line was extended from the existing 33 kV Lira – Kitgum 33 kV grid through a tee-off at Rackoko. Key technical data:

- 100 mm² All Aluminum Alloy Conductor (AAAC) bare conductors
- Transformer tee-offs and low voltage (LV) reticulation networks are 50 mm² AAAC overhead conductors
- The power line construction type is BS 1320 Wood Pole Construction with vertical wiring and shield wire protection.
- All transformer tee-off structures are fitted with drop-out fuses, and a metering unit, Load Break Switch (LBS) and auto-recloser are fitted at both ends where the line connects to existing grids.

According to PACMECS the Rackoko – Awere – Lalogi project had 17 transformer installations at the time of the site visit, 305 single-phase and four (4) three-phase customers. It is however noted that REA, in their 2015 Annual Report, reports that 10 transformers were installed. The monitoring reports do not show the number of transformers per contract or the number of transformers installed. The Consultant was not able to verify the number of transformers installed during the site visit.

Line quality. The quality and condition of the line was inadequate with several protection equipment not functional. Additionally, there were several rotten poles that needed to be replaced. At the time of the visit, 228 poles were being replaced with contractors on the ground. The poles were being replaced by the original contractor, reportedly at no additional cost due to the supply of poor-quality poles in the project construction phase.

Regarding reliability, connected customers interviewed reported frequent and long outages throughout the week. Most customers were unhappy with the service provided by PACMECS. The outages were attributed to the ongoing replacement of rotten poles, as well as the lack of stability on the backbone network from Lira to Gulu.

There were several equipment failures on the line. At the time of this site visit, only two of the four air break switches (ABSs) were functioning. Two of the three load break switches were faulty. The communication to REA to replace the faulty equipment was unclear and the equipment had been faulty for several months.



2.2.3 *Key Challenges*

Network Performance. The key challenge in the project area was the poor technical performance of the network with low reliability caused by several factors, including poor quality materials used during construction, long response times for maintenance, and instability of the backbone.

Governance. The review has established that the utility also faced several governance challenges whereby the Board did not adequately prioritize and allocate budgets for effective maintenance and operation, and community outreach. The latter caused a lot of customer dissatisfaction caused by the lack of communication on the reasons for constant outages.

Billing. All customers have pre-payment meters. However, customers reported that payment systems for buying electricity units were largely inadequate with only a few service points available, and extended delays to get the units after payment was made.

Connections. The project also faced low revenues as a result of the limited connections on the line.

Bush fires caused by agricultural practices have caused pole losses in the past. However, PACMECS was not able to provide records of poles lost from bush fire. PACMECS has reportedly mitigated this problem by digging and clearing the corridor of the distribution lines to minimize spread of fire to the wooden poles. These measures were reported to cost the utility UGX 8.1 million per annum.

Wayleaves. The utility was previously unable to clear overgrown vegetation under stretches of the line because access was not granted following the delayed payment of wayleaves by REA in some project areas.

3 Review of Project Implementation and Design

The review of project implementation is mainly based on a review of reports, and to a lesser degree interviews with key stakeholders. It is more than five years since the last project was commissioned, and people's memories of project execution are generally vague.

3.1 Relevance

Relevance is the extent to which the intervention is suited to the priorities and policies of the target group, recipient and donor.

A review of decision- and strategy documents from when the projects were established (around 2011) shows that they were considered highly relevant and in line with both governing principles of Norwegian energy development assistance, as well as Ugandan strategies and plans, at the time.

Relevance for Norway: On the Norwegian side, the rural electrification support was firmly anchored in relevant policies for development assistance and the Government's *Clean Energy for Development Initiative*. Relevant policy and guidance documents included the *Clean Energy for Development Action Plan for 2009-11* and the Embassy's Strategies and Action Plans¹.

Relevance for Uganda: On the Ugandan side, the rural electrification projects were in line with the *National Development Plan for 2010-15*, the *2001 Rural Electrification Strategy and Plan* and they supported the Government's vision of "Universal Access to Electricity by 2035". The *2008 Indicative Rural Electrification Master Plan (IREMP)* set criteria for selection of prioritized rural electrification projects. All the projects were chosen based on the IREMP selection criteria and considered to be priority projects.

3.2 Review of Progress

A review of monitoring reports confirm that all eight projects were commissioned between February 2012 and May 2014, each with subsequent defects liability periods. After end of the defects liability periods the projects were handed over to the concessionaire (operator) with license to operate and maintain the line. More specifically;

1. **Muhanga – Kyempene:** The Contractor (Ferdult Engineering Services) completed the project as per the scope and it was commissioned in February 2012. The defects liability period ended, and the contractor was relieved of any responsibilities. The line is operated by the Uganda Electricity Distribution Company Limited (UEDCL).
2. **Myanzi - Kiganda:** The Contractor (Ferdult Engineering Services) completed the project as per the scope and it was commissioned in February 2012. The defects liability period ended, and the contractor was relieved of any responsibilities. The line is operated by UEDCL.
3. **Mubende – Kyenjojo:** The project was completed as per the scope and commissioned in February 2013. The defects liability period was extended to 15 months to allow the contractor (C&G Andijes Group Limited) to rectify outstanding snags before being relieved of his responsibilities. The line is operated by KRECS.
4. **Kabale – Kisoro:** The project was completed as per the scope and commissioned in December 2013. The project had outstanding technical problems after the end of the defects liability period, and REA retained 40% of the final payment until the issues had been rectified. In April 2015 the Contractor (A2Z Maintenance and Engineering Services Limited) claimed to have rectified outstanding snags and was relieved of further responsibilities. However, the monitoring consultant found out that the contractor

¹ Including: Strateginotat om bilaterale relasjoner, Three-Year Plan for 2011-13, Action Plan for 2011, Helhetlig innsatsprogram for ren energi (juli 2009)

had failed to rectify all snags. REA then stepped in to assist the concessionaire to complete the outstanding issues. The line is operated by UEDCL.

5. **Rakai – Lyantonde – Sembabule:** The project was completed as per the scope and three sections of the line were commissioned in July 2013, while the final section was commissioned in February 2014. The project had outstanding problems after the defects liability period ended in May 2015 and REA instructed the Contractor (LTL Project Limited) to rectify before payment of the remaining 5% retention. In the 2016 Annual Report REA confirms that all issues were addressed, and that the final retention was paid to the contractor. The line is operated by UEDCL.
6. **Gulu – Adjumani - Moyo:** The project was completed as per the scope and commissioned in May 2014. The project had outstanding technical hitches after end of the 12-months defects liability period. REA agreed with the Contractor (C&G Andijes Group Limited) that he would rectify all the outstanding issues and the liability period was extended. REA reports that the final works (installation and commissioning of additional capacitor banks) were being completed towards the end of 2016, and that the final retention had been paid. The line is operated by UEDCL.
7. **Rackoko-Awere-Lalogi:** The project was completed per the scope and commissioned in April 2014. The project had outstanding snags after end of the defects liability period in April 2015 and the liability period was subsequently extended. In their 2016 Annual Report, REA reported that while most of the outstanding snags had been rectified, some rectification work was still ongoing. However, the final retention fee had been paid out to the contractor (China Jiangxi Corporation). The line is operated by PACMECS.
8. **Apala-Adwari-Kiru:** The project was completed as per the scope and commissioned in November 2013. However, due to late delivery of service connection materials, the defects liability period was extended to May 2015. The section from Apala – Adwari – Lotuke is operated by UEDCL, while the section from Orwamuge – Kiiru – Morulem is being operated by PACMECS.

There were still outstanding difficulties after the end of the defects liability period, and REA decided that it would finance rectification works using the retention fee and request a quotation from the operator PACMECS.

It is, however noted that the project still is not formally closed by REA. The retention fee has not yet been paid to the Contractor (CPCC International Company (U) Limited - see chapter on financial management) due to outstanding technical hitches. REA informs that the Contractor (CPCC International Company Uganda Limited) closed business and was not available to address the issues during the defects liability period. To date, REA has not managed to procure another contractor to complete the works, nor pay back the retention. Payment is made challenging by the fact that the legal entity with which REA signed contract with no longer exists.

3.3 Review of Project Organization and Implementation

All the projects had similar organizational setups. Both Agreements were signed between the Norwegian Ministry of Foreign Affairs, represented by the Norwegian Embassy in Kampala, and the Government of the Republic of Uganda, represented by the Ugandan Ministry of Finance, Planning and Economic Development. REA was contractually defined as *Implementing Agency* responsible for implementing the projects.

The projects have thus been implemented as separate construction contracts, with both Contractors and Construction Supervision Consultants procured by REA through competitive tendering. The Contractors were responsible for detailed design, procurement and construction of the projects. In addition, the

Norwegian Embassy entered into a Consultancy Assignment Agreement with KPMG for monitoring of the Government of Uganda's implementation of power sector projects funded by Norway, hereunder the rural electrification projects.

3.3.1 *Project Management and Construction Supervision*

As Implementing Agency REA had overall responsibility for planning, implementation, reporting and monitoring of the projects. REA appointed a designated Contract Manager for each construction contract.

REA entered into the following Contracts:

- Construction Supervision Consultant contracts (4)
- Construction works (EPC) contracts (8)
- Baseline study consultancy contract (1, only under 10/0039 agreement)

Construction supervision

Construction Supervision Consultants (CSC) were competitively procured by REA and their scope included construction supervision, contract management and monitoring during defects liability period. The CSCs had the role of Project Manager as defined by the construction contract. In this capacity, the CSCs represented and acted for REA, including deciding contractual matters (apart from contract variations), giving notices, instructions, orders, certificates, approvals and other communication under the Contract. All the companies awarded CSC contracts were Ugandan - see Annex A for an overview.

The regular monitoring reports prepared by the Monitoring Consultant document a general lack of performance of the CSCs in all contracts. The Supervision Consultants appear to have had limited presence on site, not have followed up projects, not have held Contractors accountable in line with their mandate. The monitoring reports also fault the CSCs for limited reporting not in accordance with their contracts. In interviews, REA recognizes this lack of supervision performance, partly explaining it with the local companies' lack of construction supervision experience at the time of contract signing. REA acknowledges that the initial Terms of Reference/tender documents for procurement of CSCs required inadequate site supervision presence but highlight that their standard Terms of Reference for construction supervision later have been improved based on experiences from the procurement for the Norwegian funded projects.

Overall, this Review has established that:

- i. Contracts were procured competitively in a fair and transparent manner, as documented in the monitoring reports
- ii. The projects had a clear division of role and responsibility between REA and the CSCs, where the latter had the contractual mandate of Project Manager
- iii. Construction supervision was generally characterized by insufficient site presence, inadequate follow up of the Contractors, as well as limited documentation by the SCSs.

It should be noted that most of the Supervision Contracts commenced several months after construction start (4 to 11 months), significantly reducing the effect of construction supervision work.

Risk management

As confirmed by document review and interviews, management of risks was not an integrated part of project management. Risks were considered by REA in their annual reporting, but very lightly and mostly as a summary of challenges during the preceding year. Whereas risk management was not part of the scope of the Monitoring Consultant, it could be argued that the setup with independent monitoring is a risk

mitigating measure in itself; to reduce reputational, financial and various compliance risks related to implementation.

Reporting

REA's reporting requirements to the Embassy were specified in the Agreements, and included:

- Progress report, including work plan and budget. Submitted annually for Agreement 10/0021 (Two Projects) and semi-annually for Agreement 10/0039 (Six Projects).
- Financial statement submitted annually
- Audit report of the financial statements of the project submitted annually
- Final report within three months after completion of the projects; containing an assessment of effectiveness, impacts, sustainability and a consideration of lessons learnt.

Overall, the Review has established that REA is not maintaining a proper document archive for the projects, and most completion documentation and certificates are lacking. The review has not established whether this is due to lack of archiving at REA, or missing submissions from the Contractors/ Supervision Consultants. The review further indicates that:

- i. REA submitted progress reports and financial statements for the two projects on an annual basis. The annual report for 2016 was the last submission
- ii. In agreement with the Embassy, REA did not submit semi-annual progress reports as required for Agreement 10/0039 (Six Projects)
- iii. The Consultant has not been able to establish whether audit reports were submitted every year as required
- iv. REA has not submitted Final Report for any of the two Agreements

3.3.2 Monitoring Consultant

In 2012, the Embassy entered into a Consultancy Assignment Agreement for provision of monitoring consultancy services with KPMG AS (contract number 11/15244). The objective of the assignment was to monitor the Government of Uganda's implementation of power sector projects supported by Norway, mainly transmission line projects implemented by UETCL and rural electrification projects implemented by REA.

The scope of the monitoring services was divided into (i) pre-procurement monitoring and (ii) contract implementation monitoring. The *pre-procurement monitoring* was mainly compliance checks and independent reviews of procurement documents and processes. The *contract implementation monitoring* included **monitoring of financial aspects** of the projects being implemented, as well as **monitoring of management and results**. The latter included that the Monitoring Consultant could make site visits, upon prior written approval by the Embassy, as well as attend site meetings as an observer to assess progress and results. The consultancy agreement specified that "*it falls outside the scope of services to comment on the technical aspects of the projects, other than if it is perceived that another opinion in this respect should be considered, in which case the matter shall be raised with the Embassy [...]*".

The initial contract period was 02.05.2012 to 31.12.2013, with potential for extension up to 2017. The reporting requirements were quarterly monitoring reports, and a final report at completion of the consultancy agreement. The contract duration was extended until 2016, and in agreement with the

Embassy the monitoring consultant prepared Project Closure Reports for the six projects under Agreement 10/0039 and a summary monitoring report, instead of a final report.

The Review has established that the scope of the monitoring consultancy increased significantly compared to the original scope of work, both in terms of technical scope, site visits, and reporting. More specifically:

- i. The Monitoring Consultant carried out site visits to all the rural electrification projects between 2012 and 2015; 29 visits in total. From 2013 and onwards the site visit frequency was high, with monthly or bi-monthly visits. It is noted that ten of the visits were undertaken after end of the defects liability period of the projects visited.

Year	2012												2013												2014												2015												
Month	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	No. of visit				
Gulu-Adjumani-Moyo																																															4		
Kabale-Kisoro																																															6		
Rakai-Sembabule																																															8		
Rackoko-Awere-Lalogi																																															3		
Mubende-Kyenjojo																																															3		
Apala-Adwari-Kiru																																															3		
Muhanga-Kanungu																																															1		
Myanzi-Kiganda																																															1		
Site visit frequency																																															29		
																					</																												

Figure 4 Monitoring site visit frequency

- ii. During site visits, the Monitoring Consultant carried out detailed monitoring of the technical aspects of the projects. Reviews of technical aspects were mainly summarized in Site Visit Reports, but also discussed in meetings between REA and the CSC.

Given the level of detail and the relatively high frequency of site visits, there are clear indications that the scope of the Monitoring Consultancy partly overlapped with the scope of the CSCs. Interviews confirm that there is a perception among key people involved that the Monitoring Consultant ended up taking an overlapping construction supervision role. Whereas REA was pleased with the quality of the monitoring advice, and acknowledge that it added value, they also recognize that the detailed technical follow-up to a certain degree undermined the CSCs. The Monitoring Consultant used sub-contracted Ugandan engineers for the monitoring without formal authority in the construction contracts. Their unclear mandate reportedly created tensions with both the CSCs and REA.

- iii. In line with the increased monitoring scope, reporting became more comprehensive than originally planned. The monitoring consultant submitted quarterly monitoring reports from Q3 2012 to Q4 2015 (14 reports) in accordance with the consultancy agreement. In addition, KPMG writes in their closure report that the following was submitted:
 - a. Monthly status and progress reports from May 2012 to December 2015 (44 reports)
 - b. Three separate status update reports (May 2014, March 2015, June 2015)
 - c. Site visit reports from May 2012 to July 2015 (29 reports)

In sum, it is concluded that while the Monitoring Consultant delivered relevant procurement and financial management advice, the relevance of the technical monitoring/ supervision is more uncertain. The overlapping technical supervision role appear to have undermined the CSC to some degree, and advice from the Monitoring Consultant to a lesser degree followed up during project implementation and by the Contractor at site. The Monitoring Consultant would have been more effective if the role, especially in terms of construction supervision management, had been formal and clearer.

3.3.3 *Integration of cross-cutting issues*

Environment and Climate

The Feasibility Study found the negative impacts from the rural electrification projects to be minor, short-term, and easily mitigated. Based on this, REA submitted environmental project briefs, as well as Environmental and Social Management Plans to the National Environment Management Authority (NEMA) in 2010 and subsequently received their approval. The management plans also included occupational health and safety issues. REA included implementation of the Environmental and Social Management Plan in the EPC Contracts, as well as supervision of environmental compliance in the Supervision Contracts.

The review has not been able to verify to what degree environmental and social management plans were implemented during construction. The Annual Reports from REA provide limited information, but the Monitoring Consultant listed several minor environmental and social gaps in the mid-term review, including occupational health and safety gaps. The mid-term review however noted that *“All the projects have responded well based on our assessment of the environmental and social considerations”*.

Gender and women’s rights

Gender planning was integrated from the initial project design. REA presented an analysis and proposal for inclusion of gender in the Program Document for 10/0039 (Six Projects), and an international energy/gender consultant (Energia) was hired separately by the Embassy to support REA in the gender planning. A scoping mission to identify concrete possibilities for integration of gender activities in the projects, both during construction and after completion was undertaken in 2011. REA established an internal gender task team and the plan was that REA, with support from Energia, would develop a proposal for a separate gender component to be implemented alongside construction of the rural electrification projects.

Despite extensive gender planning at the onset of the project, no gender-specific activities were implemented during implementation. Gender issues have not been considered in the annual reporting, and not reflected in any of the results or monitoring reports reviewed.

Human rights

The major concern related to potential violation of human rights in these projects is lack of timely payment of compensation for land and property taken by the project construction. This is covered separately under section 3.4

Anti-corruption

The independent Monitoring Consultant monitored procurement and financial management compliance on a quarterly basis. For all parties involved this was a strong anti-corruption measure. In the mid-term review the Monitoring Consultant concluded that REA’s financial management systems were satisfactory. Financial management is covered separately under section 3.5.

3.4 Review of REA's Compliance with Contractual Obligations

The Agreements specify the following Ugandan contributions to the projects:

- i. Any cost associated with wayleaves compensation and taxes
- ii. Public education, awareness and outreach, productive uses of electricity (only Agreement 10/0039)
- iii. Any costs connected to the projects beyond the set limit of the grant

3.4.1 Wayleave compensation

REA's obligation for payment of compensation to owners whose property is affected by electrification projects is defined in Section 69-90 of the Electricity Act of 1999. For medium- and low voltage electricity lines this mainly means compensation of crops, land and other property damaged or otherwise affected by the project.

Individual compensation amounts are typically relatively small and originally it was a requirement that claimants had a bank account to which the compensation amounts could be paid. Acknowledging that the cost of opening a bank account could exceed the compensation amount, REA was granted a waiver of the bank account requirement from the Accountant General to simplify the payment process and reach all the claimants in the projects funded by Norway. REA selected Post Bank Uganda as service provider, and compensation funds were thus transferred to and payments done by Post Bank.

REA hired external property valuation consultants in 2012/-13 to assess and value crop- and land losses caused by the projects. The resulting valuation reports were submitted to the Chief Government Valuer and later approved. Thereafter, REA carried out a process to verify the compensation claimants and disclose the approved compensation amounts.

However, despite a relatively timely property valuation process, payment of compensations has been significantly delayed. Despite annual budget requests from REA, Ministry of Finance did not avail funds for compensation payment before June 2018 (Financial Year 2017/18).

REA then started a staged compensation payment process in February 2019. In total, 14,533 people are entitled to UGX 5.5 billion in compensation payment. To date, 12,306 have been duly compensated (~85%). A random selection of compensation payment vouchers was inspected as part of this review. The vouchers inspected were correctly filled in and signed by the owner of the property, the REA field officer, a representative for Post Bank, and witnessed by the Chairperson of the Local Council 1 (village level administration).

Table 3 REA overview of compensation payments to project affected people (PAP)

COMPENSATION PAYMENT STATUS FOR NORWAY FUNDED PROJECTS.						
POWERLINE	TOTAL NO. OF PAPS	TOTAL COMPENSATION AMOUNT	NO. OF PAPS PAID	AMOUNT PAID	PAPS UNPAID	AMOUNT UNPAID
MUBENDE - KYEGEGWA-KYENJOJO	1912	446 344 038	1737	425 794 850	175	20 549 188
KABALE - KISORO	1383	790 547 146	551	740 266 428	832	50 280 718
RAKAI-LYANTONDE-SEMBABULE	3688	1 205 977 860	3317	1 161 415 935	371	44 561 925
GULU-ADJUMANI-AMURU-MOYO	1690	433 565 035	1521	413 222 100	169	20 342 935
RACKOKO-AWERE-LALOGI	457	135 863 153	416	133 360 350	41	2 502 803
APALA-ADWARI	996	973 417 845	974	935 499 200	22	37 918 645
APALA-ADWARI SUPPLEMENTARY	177	60 393 400	173	59 808 050	4	585 350
MUHANGA - RWAMUCUCU& MYANZI-	4230	1 449 490 942	3617	1 375 024 903	613	176 741 564
TOTAL	14 533	5 495 599 418	12 306	5 244 391 816	2 227	353 483 127

REA is planning a final compensation payment exercise towards the end of 2019 to reach the 2,227 households who have not yet been compensated. The remaining are claimants who could not be reached during the initial payment process (moved away, deceased, not home, etc.) or where new property rights disputes had emerged.

Whereas both the valuation process and the payment process initiated in 2019 appear to have been executed in a structured and orderly manner, REA reports that the lack of prompt compensation payment has been a source of discord and tension between claimants and grid operators. This was manifested through land owners denying grid operators access to distribution line corridors for maintenance and bush clearance.

It has been noted that the compensation amounts being paid differ from the compensation amounts previously reported by REA in the Annual Reports. The total compensation amount has increased from UGX 4.3 to 5.5 billion. See table below. REA explains that some of the figures presented in earlier reporting were draft amounts that were later revised by the Chief Government Valuer. In addition, REA had to conduct supplementary valuations for the Apala-Adwari-Kiru powerline due to additional damages. This helps explain the increased compensation cost.

Table 4 Wayleave compensation considerations

	Compensation amount (million UGX)	Revised amount (million UGX)	MV line length (km)	Compensation per km (million UGX)
Mubende- Kyenjojo	446	446	164	2,7
Kabale – Kisoro	791	791	143	5,5
Rakai-Lyantonde-Sembabule	153	1206	271	4,5
Gulu-Adjumani-Moyo	434	434	263	1,7
Rackokoko-Awere-Lalogi	136	136	64	2,1
Apala-Adwari-Kiru	973	1047	117	8,9
Valuation for both 0021 projects:	1450	1450		
TOTAL	4383	5510		

Considering compensation amount per kilometre of MV line, it is noted that the Apala-Adwari-Kiru project had a significantly higher compensation cost per kilometre compared to the other projects (UGX 8.9 million compared to an average of UGX 3.3 million per km for the other projects). REA explains that the compensation amount for each powerline is dependent on the nature of crops grown in an area, the respective district compensation rates and whether or not there are buildings adversely affected by the powerline. The Apala-Adwari-Kiru powerline adversely affected about 15 buildings and plots of land which greatly increased the compensation cost per kilometre.

Compensation payments have been, and continue to be, a significant challenge for REA. In 2016, the compensation debt was UGX 18 billion and REA management appeared before a parliamentary committee to request that either Ministry of Finance provide adequate funds for compensation payment or government amends the law to make the wayleaves for rural electrification projects free².

3.4.2 *Public education, awareness and outreach*

To ensure a high number of customer connections and to stimulate productive uses of electricity in the communities electrified by the projects, REA had contractual obligation to carry out public education initiatives.

² https://www.newvision.co.ug/new_vision/news/1431662/rea-checks-compensation-debts

The mid-term review concluded that potential customers in villages being electrified generally lacked basic information about electricity use, connection procedures, cost and billing. It further concluded that REA's public awareness and information sharing during implementation was insufficient.

REA, on the other hand, informs that they had an outreach component for each of the projects that included basic information on electricity, safety and productive use. New load centers were visited at least once to provide information to the public. However, REA acknowledges that their capacity to do outreach work was very limited at the time of project implementation (only one dedicated staff working with outreach) and that this probably made the information sharing efforts inadequate. REA also points out the challenge of doing outreach work in Northern Uganda which was in a post-conflict situation, and that the outreach was mostly focused on building acceptance for the projects in the local communities.

The Review concludes that REA to a lesser degree fulfilled its contractual obligation to carry out public education, awareness and outreach, including stimulation of productive uses of electricity, in the load centres connected to the grid by the projects. Lack of resources to plan and implement public education in REA was probably a main reason.

3.5 Review of Financial Management

REA was responsible for the financial management of the projects. Their contractual obligations included submission of annual budgets, financial statements and audit reports.

The Monitoring Consultant did quarterly financial monitoring of the projects in the period from Q3 2012 to end of Q4 2015. The financial monitoring included review of bank balances and accounting records, as well as verification of outflow of funds/ project expenditures. The Monitoring Consultant was also requested by the Embassy to review selected Annual Reports and Audit Reports.

Overall, for the period from 2012 to 2016 the Monitoring Consultant concluded that REA's financial management was generally satisfactory. In their 2014 mid-term review the Monitoring Consultant noted: *"REA's financial management system was generally satisfactory. The bank reconciliation statements were properly prepared, reviewed and approved by the relevant REA officials; funds are still maintained on a separate bank account; tracking of payments to contractors/ consultants for respective projects against contract amounts is done; independent and clear records of funds received from RNE are maintained. The main exceptions noted related to timely payment of contractors and adherence to With Holding Tax provisions."* This Review has not investigated the financial management performance of REA further, and therefore relies on the assessment done by the Monitoring Consultant through their 4-year financial monitoring work.

The financial reporting and monitoring ended in 2016. The last financial reporting from REA is found in the 2016 Annual Report (dated May 2017), it provides the overall grant balance and corresponding bank statements for the two agreements as per end of year 2016. REA accounts department confirms that there have been no draw-downs on the project grant account since end of 2016. The tables below are therefore the current grant balance for the two projects:

Table 5 Grant balance UGA 3049 – UGA 10/0021 (Source: REA Annual Report 2016)

Description	Amount (US\$)	Amount (NOK)
Total Receipts	9,388,713.71	55,549,112.59
Total Expenditure	9,181,593.02	54,199,015.65
Balance of Funds	207,120.69	1,350,096.94

Table 6 Grant balance UGA 3034 – UGA 10/0039 (Source: REA Annual Report 2016)

Description	Amount (US\$)	Amount (NOK)
Total Receipts	43,219,445.24	260,767,816.97
Total Expenditure	43,419,023.87	259,546,643.26
Balance of Funds	(199,578.63)	1,221,173.71

Receipts are mainly grant payments and Government of Uganda's funding of VAT. *Expenditures* are mainly contractual payments, bank charges and payment of withholding taxes to Uganda Revenue Authority.

As per the EPC Contracts, REA retained 10% of payments due to the Contractors until completion of the works. Half the retained amount would be paid on completion, and the balance at the end of the Defects Liability Period ended, when the Project Manager had certified that all defects notified had been corrected.

The review has found that REA has still not paid the retained amount to the Contractor for the Apala-Adwari-Kiru project. REA confirms that the project has an outstanding amount of USD 300,987.39 to be settled. According to REA, the reason is that the Contractor (CPCC International Company Uganda Limited) closed business and was not available to address outstanding technical problems during the Defects Liability Period.

REA does not seem to have a strategy to close the project in place, almost six years after the project was commissioned. It should be noted that the remaining snag that REA wants to rectify (a faulty auto-recloser) using retention funds has an estimated cost that is significantly less than the amount being retained. REA is therefore advised to assess its contractual options to have outstanding issues resolved and clarify if/ how retained payments legally can be transferred.

All other projects have been closed, and Contractors have been paid the full retention fees due after the end of the Defects Liability Period.

4 Review of Program Achievements

4.1 Effectiveness

Effectiveness is a measure of the extent to which an aid activity attains its objectives. The objectives are defined in the Agreements and are similar for both Programs.

The Goal of the Programs is to “meet the rural population’s need for improved economic and social development in a sustainable way through increased access to affordable electricity services”.

Assessment of goal achievement requires an impact level analysis. Within the scope of this review a simplified cost-benefit analysis, coupled with site observations and interviews with key stakeholders, is the basis for the assessment of long-term achievements.

The key performance indicators are defined as

- Physical assets to be installed in the field
- Number of customers connected

In addition, a socio-economic baseline study was carried out in 2014 to establish a baseline against which future results and impacts of the electrification could be measured. The study proposed a high number of performance indicators with extensive baseline data. Unfortunately, the baseline report has a number of inconsistencies and errors that raise questions as to the methodology used, implementation and quality control. See a summary of our review of the baseline report in Annex B. It is concluded that the errors and inconsistencies are so fundamental and substantial that the baseline study should not be used for analytical purposes.

Overall, site observations and a few random interviews with business owners using electricity during the field visits indicate that the projects visited have had some positive impact on job creation and economic growth.

The Purpose of the Programs is “to extend power from the national grid to district headquarters, administrations, businesses, production units, and households, not yet served by the grid”.

The Programs have been constructed in accordance with plans, over-achieved on the number of connections and accomplished their purpose.

The Outputs (or immediate objectives) of the Programs are to

- Implement the Program as separate construction contracts
- Select Contractors through international tendering to undertake detailed design, procurement and construction
- Hire a Supervision Consultant through an open tendering process to undertake construction supervision on behalf of REA for each contract

The review in Chapter 3 has documented that Outputs have been realized as outlined in the Contracts.

4.1.1 Customer Connections

Connecting customers to the electricity grid is the ultimate target of any rural electrification project and the number of customer connections is therefore defined as a key performance indicator. However, the connection goals for the projects are not clearly defined, and different figures are presented in the Program Document, the Agreements, and in reports from the Monitoring Consultant respectively.

For Agreement 10/0039 (Six Projects):

- REA's Revised Program Document (July 2011) indicates that the connection goal is 7,500 customers within one year of commissioning, and 21,300 connections within 5 to 10 years of operation
- The Program Summary of the Agreement sets the connection goal at 8,000 customers in the first year of operation
- The monitoring reports use 7,407 as the total connection goal, broken down per project, but without indicating whether this is the initial or long-term target

For Agreement 10/0021 (Two Projects) the connection goal in the Program Summary is 1,679 customer connections for the two projects. It is not indicated whether this is the initial or long-term connection goal.

For coherence with earlier reporting this Review takes as its point of departure the connection goals used by the Monitoring Consultant, and the long-term goals of the Program Document. The table below shows updated customer connection status per project based on customer data collected from the Operators. PACMECS did not provide updated connection data for their part of the Apala-Adwari-Kiru line.

Table 7 Customer connections status

		Operator	Goal	Actual
1	Muhanga - Kyempene	UEDCL	1 164	2 735
2	Myanzi - Kiganda	UEDCL	515	1 908
3	Mubende - Kyenjojo	KRECS	1 536	4 502
4	Kabale - Kisoro	UEDCL	1 561	2 125
5	Rakai - Lyantonde - Sembabule	UEDCL	1 425	5 423
6	Apala-Adwari-Kiru	UEDCL	608	1 007
6	Apala-Adwari-Kiru	PACMECS		Not received
7	Rackoko - Lalogi	PACMECS	407	306
8	Gulu-Adjumani-Moyo	UEDCL	1 870	6 291
	TOTAL		9 086	24 297

A second addendum to Agreement 10/0021 (Two Projects) was signed in December 2012 for provision of 10 million NOK of subsidies to finance 9,197 additional consumer connections in networks operated by Fersult Engineering Services³. The subsidy scheme included connections in the wider concession areas of Fersult and was not restricted to the two projects financed by Norway.

In their 2016 Annual Report REA reported that the full subsidy amount had been paid and 9,197 connections made. The distribution of connections between the projects and the concession areas is not clear, and the number of connections made in addition to what is reported by the projects cannot be quantified exactly based on available documentation. However, a rough estimate is that at least 4,000-5,000 additional connections have been made outside the projects financed by Norway.⁴

Generally, the projects have had a high uptake of new connections, and the overall long-term customer connection goals have been achieved with, more than 24,000 connections achieved 5-7 years after completion of the projects. In addition, around 5,000 connections have been realized in other rural

³ Fersult later went out of business, and operation of their lines has been taken over by UEDCL.

⁴ Note that the connection update provided by the monitoring consultant (letter dated 16 October 2015) reporting 9,183 new connections in the two projects is incorrect.

electricity networks. The only project that has not achieved its connection target is the Rackoko-Lalogi line operated by PACMECS.

4.2 Efficiency

Efficiency measures whether project activities have been cost-efficient and implemented in the most efficient way compared to alternatives. The term efficiency is relating to what degree donor assistance uses the least costly resources possible in order to achieve the desired result.

Cost per Connection

It is challenging to compare costs per connection between electrification projects, as each project has its idiosyncrasies and because the number of connections will increase with time. However, the table below lists the cost per connection for a Norwegian funded sample of projects in Tanzania and Mozambique for comparison with the projects under review. EPC contract prices are used as project costs.

Table 8 Connection unit cost comparison

	Project	Project Cost (USD)	No. of connections	Cost (USD)/connection
Projects under review	Muhanga - Kyempene	3 587 799	2 735	1 312
	Myanzi - Kiganda	1 648 516	1 908	864
	Mubende - Kyenjojo	7 012 250	4 502	1 558
	Kabale - Kisoro	6 704 060	2 125	3 155
	Rakai- Sembabule	8 014 075	5 423	1 478
	Apala-Adwari-Kiiru	3 881 297	1 007	3 854
	Rackoko - Lalogi	2 260 560	306	7 387
	Gulu-Adjumani-Moyo	8 222 073	6 291	1 307
Tanzania	REDP Arusha	4 038 648	4750	850
	REDP Mara	4 431 172	2458	1 803
	REDP Pwani	4 690 188	3418	1 372
	REDP Tanga	1 618 248	1204	1 344
	REDP Iringa	1 812 004	1644	1 102
	REDP Mbeya	14 057 520	17736	793
Moz	Namacurra Rural Electrification Project	8 400 601	6 098	1 378
	Namacurra extension to Pebane	8 051 879	7 040	1 144

The cost for the Ugandan projects varies greatly, from 864 to 7,387 US Dollar per connection. A 2009 World Bank study⁵ estimated the typical price range for on-grid electrification in rural areas to between USD 730 and 1,450 per connection. 5-7 years after commissioning, the connection cost of five of the eight projects under review are close to or within the World Bank benchmark range. The Kabale-Kisoro line in the far south (USD 3,155), as well as the two northern project Apala-Kiru (USD 3,854) and Rackoko-Lalogi (USD 7,387) have significantly higher connection costs.

⁵ Unit Costs of Infrastructure Projects in Sub-Saharan Africa", *Africa Infrastructure Country Diagnostic*, WB

For comparison, in Kenya a basic solar home system from M-Kopa Solar with a PV panel, battery, radio, four lights, phone charging cables and a torch included costs less than 200 US Dollars (M-Kopa 5 Device, www.m-kopa.com). For the cost of one connection in the Rackoko-Lalogi project, 36 household could have gotten basic solar home systems that would have covered basic household electricity needs and provided more reliable electricity supply.

The low number of connections/ high unit costs for the northern projects can probably be attributed to the fact that the project areas are not densely populated, with a relatively poor population, combined with an unprofessional grid operator. It should be noted that PACMECS have not provided connection data for the part of the Apala-Kiru line they operate, and there is some uncertainty around whether the connection figures available are for the line segment operated by UEDCL or the whole line.

The unit costs of the two rural electrification projects financed by Norway in Mozambique (Namacurra and Namacurra extension) are comparable as the scope of the projects was similar (including both MV and LV) and the projects had been in operation 5 and 8 years respectively when the unit costs were estimated. The figures from Mozambique compare with the lower unit costs in Uganda.

The cost in the Rural Electrification Densification Project (REDP) in Tanzania is not directly comparable as the projects did not include MV scope and figures are from the time of commissioning. They have however been included to illustrate what is possible with an alternative rural electrification project design. The Densification concept includes only villages that are located under or close to an existing MV grid, thus only a transformer and LV network is required. Through this design only the most cost-efficient rural connections are prioritized. Some of the REDP unit costs are thus very cost-efficient, at the time of commissioning, also compared to the WB benchmark.

Overall, it is concluded that five of the rural electrification projects in Uganda have relatively cost-efficient connection unit cost, both compared to similar projects in Mozambique and benchmarked against World Bank data. However, three of the projects are very costly due to a low number of connections compared to the total investment cost.

Cost per kilometer line

In the Decision Document for Agreement 10/0039 prepared by the Embassy in 2011, it is stated that “in all the grid extension project REA has undertaken the average cost is 42,000 US Dollars per kilometre line”. The cost per kilometre of MV lines for the eight projects range from 30,000 to 47,000 USD/km, and the average is 39,000 USD/km, which is below the average of other REA projects at the time. The cost per kilometre MV line in the two projects in Mozambique are USD 30,000 and 42,000 respectively. With this comparison, the line cost in Uganda therefore seem to be within a reasonable price range.

Competitive procurement

The cost per kilometre of line comparison between projects may, however, not be an accurate measure of cost-efficiency, as it often is unclear what scope is included in cost estimations, and price levels depend on external market factors like availability of contractors, type and prices of raw materials. In terms of cost-efficiency it is therefore arguably more important that Contractors and other suppliers have been competitively procured, and that the procurement is fair and transparent. The Monitoring Consultant reported both in regular monitoring reporting, as well as in the mid-term review, that *“the procurement of construction, contract management and supervision [...] was conducted with transparency and fairness, and in accordance with the Public Procurement and Disposal of Public Assets Laws, Regulations and Guidelines. In addition, the procurement method was duly approved by the REA contracts committee.”*

Overlapping scope

As noted in chapter 3, there was an overlap between the CSCs and the Monitoring Consultant when it came to technical supervision/ monitoring of the projects. The total cost of the four CSC Contracts signed by REA was equivalent to approximately NOK 5 million⁶, whereas the total disbursement under the Monitoring Consultancy Agreement was 23 million NOK. It is important to note that the Monitoring Consultant had a much wider scope than technical monitoring, and the monitoring scope also included other projects in the energy portfolio of the Norwegian Embassy. However, with 29 site visits and subsequent reporting, the cost of technical monitoring was significant. It is likely that the technical supervision/ monitoring arrangement could have been more cost-efficient with more clarity around role and responsibility between the Supervision and Monitoring Consultants.

4.3 Simplified cost-benefit analysis

A full cost-benefit analysis (CBA) of the project would have required collection and analysis of survey data, and therefore falls outside the scope of this review. However, a simplified CBA has been conducted. It is based on data collected during the field visit and, where no project specific information is available, value transfer from other comparable projects in the region and projections based on the Consultant's experience.

It is recognized that this approach entails considerable uncertainty. However, the analysis should still provide a useful high-level indication of the economic performance of the respective projects. Year-by-year connection data were unfortunately only available for three of the eight projects, namely:

- Gulu-Adjumani-Moyo
- Mubende-Kyenjojo
- Rackoko-Awere-Lalogi

It follows that the CBA had to be limited to these three projects. Jointly, however, they constitute a representative sample of the portfolio.

4.3.1 *Applied data and assumptions*

The three projects have at the time of this review been operational for six to seven years but have a technical life of approximately 20 years. Therefore, the analysis will build on historical data from commissioning to date obtained from the utilities and regulator, combined with a forecast for the remaining 13 years of the technical life. The following sections outlines the applied data and assumptions.

Economic value of electricity

Establishing the economic value of electricity is a challenging task. Norplan (2014)⁷ found that the economic value of grid electricity in Northern Mozambique is US\$ 0.71/kWh, which is within, but on the low end of the range of similar estimates. The value is largely driven by the high cost of kerosene, which is found to be the primary energy source for lighting in non-electrified areas. While increased market penetration of solar home systems and solar lanterns since 2014 may have reduced the alternative cost to grid electricity somewhat, this effect will have been partly or wholly offset by inflation. The rural areas in Northern Mozambique and Uganda are deemed comparable, and **an economic value of USD 0.71/kWh is applied.**

⁶ 1816 million Uganda shillings

⁷ Impact Assessment of Rural Electrification Projects in Mozambique, Norplan 2014.

Connection numbers

Analysis of the year-by-year historical connection data for the three projects reveals a near linear year-on-year development (see figure below). On the one hand one would expect this growth to decline over time as the market matures, but on the other hand Norplan (2014) demonstrates a contravening effect where people are more likely to connect over time, as they get more familiar and comfortable with the use of electricity. For the purpose of this analysis, therefore, the linear increase is extrapolated. The resulting 20-year connection numbers are provided in the figures below.

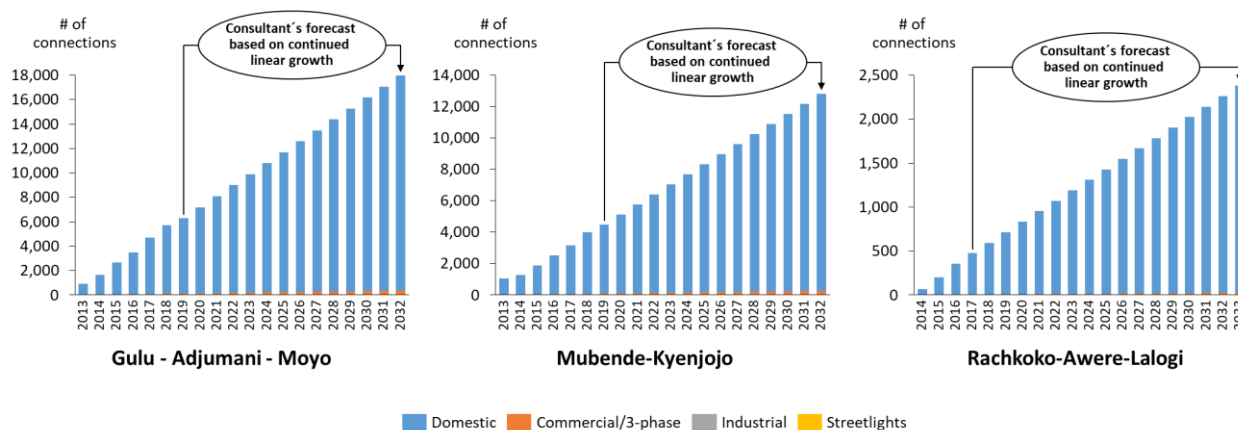


Figure 5 Connection numbers

Other data and assumptions

The following table summarizes the remaining data and assumptions applied in the CBA, as well as their sources.

Table 9 Other data and assumptions

General assumptions	Unit	Gulu - Adjumani - Moyo	Mubende-Kyenjojo	Rachkoko-Awere-Lalugi	Source
CAPEX (incl. planning and way-leave)	USDm	8,467,600	7,267,962	2,433,145	Project reports
Construction time	months	22	24	22	Project reports
Distribution of expenditure over construction period		linear	linear	linear	Simplified assumption
Commissioning	year	2012	2012	2013	Project reports
Annual consumption per domestic connection	kWh	540	413	439	ERA data ⁸
Annual consumption per commercial connection	kWh	12,000	9,000	15,000	ERA data
Annual consumption per Industrial connection	kWh	30,000	N/A	N/A	ERA data
Annual consumption per streetlight connection	kWh	4,000	N/A	N/A	ERA data

⁸ ERA Electricity Distribution Statistics 2018

General assumptions	Unit	Gulu - Adjumani - Moyo	Mubende-Kyenjojo	Rackoko-Awere-Lalogi	Source
Annual growth in consumption per connection		0 %			ERA data
O&M-costs (as share of total investment)		3 %			Consultant's experience from the region
Technical life	years	20			Consultant's experience ⁹ from the region
Outages		4 %	4 %	13 %	Consultant's experience and utility data ¹⁰
Domestic tariff	UGX	769.5	615	635.4	ERA data
Commercial tariff	UGX	686	552	593	ERA data
Large industrial	UGX	382	N/A	N/A	ERA data
Streetlight	UGX	382	N/A	N/A	ERA data
Collection rate	%	100			Based on full coverage of pre-paid meters
Long Run Marginal Cost of electricity generation (LRMC)	USD	0.2			GET-FiT annual report 2018
Economic discount rate		10 %			Standard assumption for dev. countries

4.3.2 Cost-benefit results

The figures below present the flows of economic costs and benefits resulting from the analyses, as well as key Performance Indicators (KPIs) for each of the three projects. The reader is reminded of the uncertainty inherent to all forecasting.

Gulu-Adjumani-Moyo

As seen from the figure below, the Gulu-Adjumani-Moyo line is found to be economically beneficial, with an IRR of 18% (well above the 10 % shadow cost of capital assumed for Uganda). 70 percent of the benefit is derived from household connections, with commercial connections making up nearly all of the remaining 30 percent. The demand from industrial connections and streetlights is negligible.

⁹ It is noted that the Project Document and Appraisal applies a 15-year technical life in their analyses

¹⁰ Annual outage numbers for the Rackoko-Awere-Lalogi line has been received and the average for previous years applied. For the two other lines we have no specific outage data, and so reasonable assumptions have been applied.

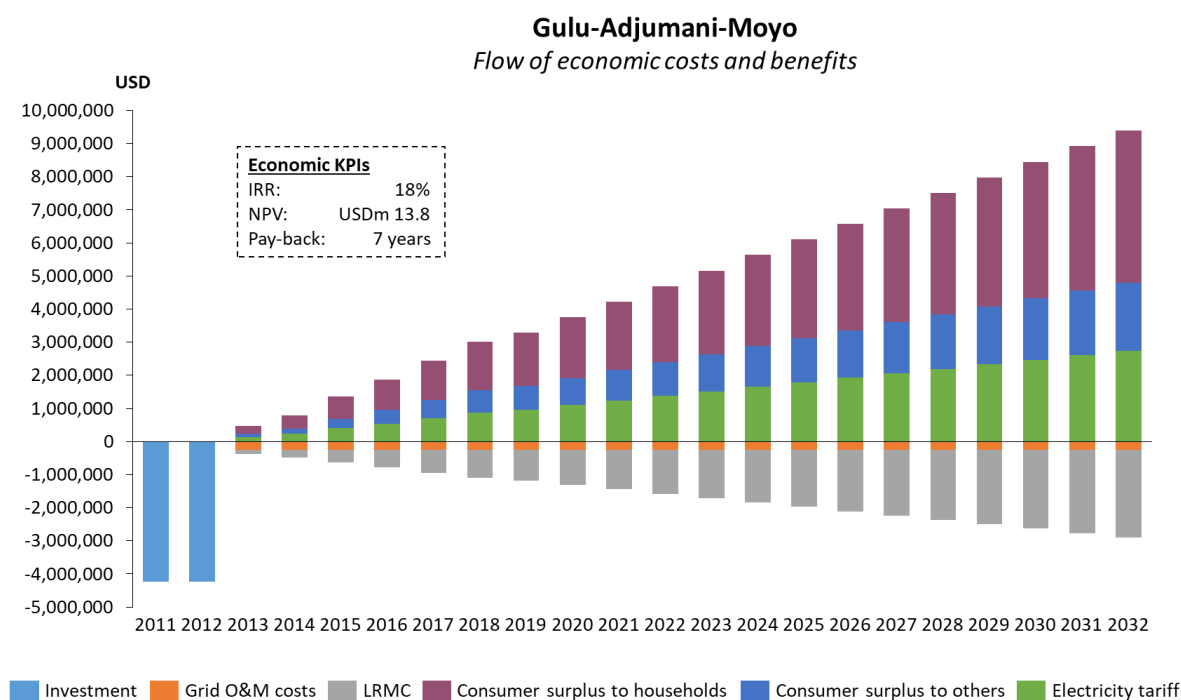


Figure 6 Flow of modelled economic costs and benefits for the Gulu-Adjumani-Moyo line

Mubende - Kyenjojo

With an IRR of 12 percent, the economic performance of the Mubende-Kyenjojo line is also found to positive given the applied assumptions.

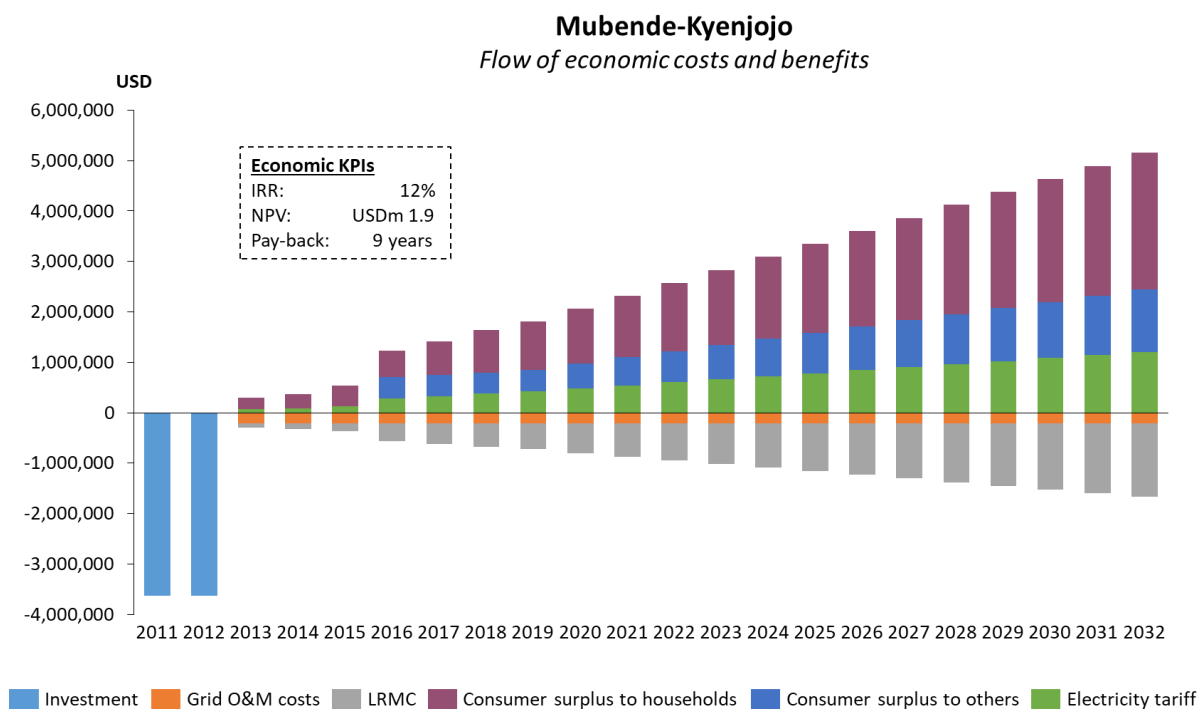


Figure 7 Flow of modelled economic costs and benefits for the Mubende-Kyenjojo line

Rackoko - Lalogi

Finally, the Rackoko-Awere-Lalogi line is found to be a poor investment from an economic perspective given the applied assumptions, with an IRR of only five percent (i.e. the resources invested in this project

would, from society’s perspective have been better spent on other possible investments in Uganda). Based on the applied assumptions it is concluded that without far greater efforts to increase the number of domestic and productive connections, an investment of this size cannot be economically justified in the scarcely populated area of Northern Uganda.

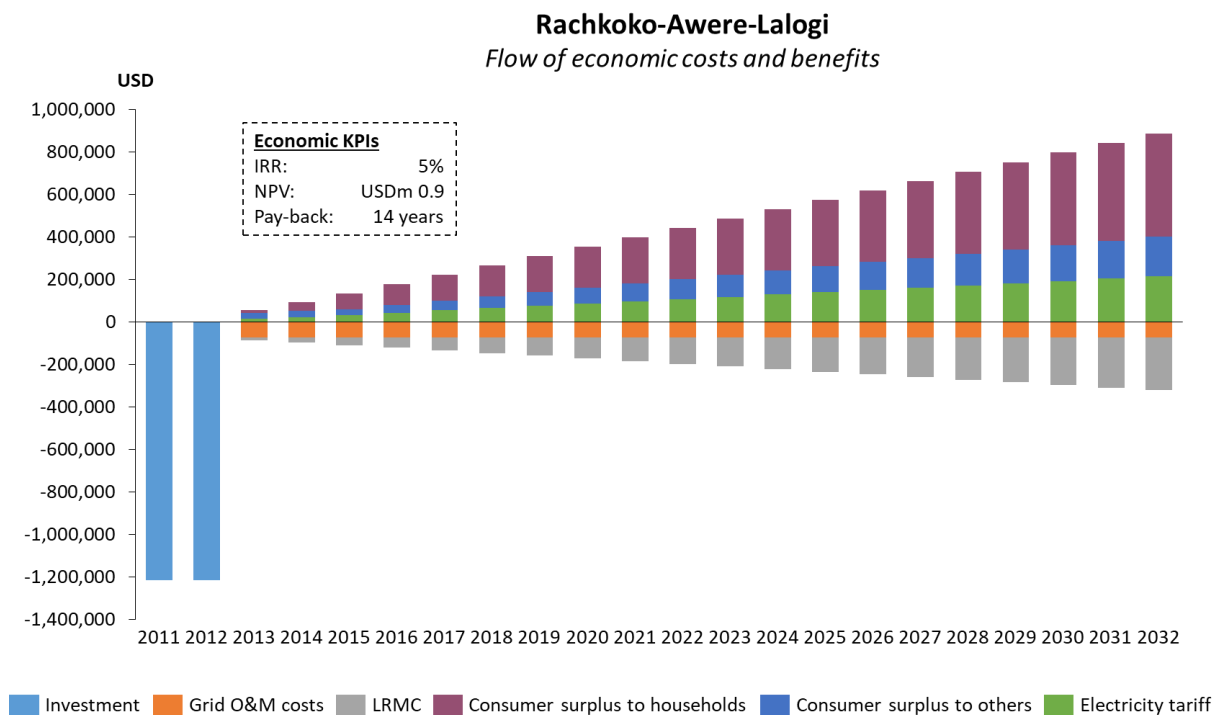


Figure 8 Flow of economic costs and benefits for the Gulu-Adjumani-Moyo line

4.4 Sustainability

Sustainability refers to an assessment of the degree to which the benefits of the projects are likely to continue after donor funding has been withdrawn.

Sustainability in rural electrification projects is closely related to operation and maintenance of the infrastructure, both to maximize the technical lifespan of the assets, and ensure security and quality of electricity supply.

There are some major sustainability concerns related to operation and maintenance of the two projects visited, in particular the Rackoko - Lalogi project operated by PACMECS. These include:

- i. Low number of connections and low electricity consumption creating a small revenue base for the grid operator
- ii. High degree of equipment failure and outages on the lines for several possible reasons (quality, operation and maintenance)
- iii. High-cost governance structure of the cooperatives

Low number of connection and low consumption

The number of connections remain low, especially in the Rackoko-Lalogi project, and electricity consumption significantly lower than what was assumed during planning. Low electricity consumption translates into low revenues for the grid operator. Whereas the electricity tariff is adjusted by the regulator ERA annually, and it considers expected annual operation and maintenance costs, it does not cover the cost of the major repairs, replacement of poles and equipment experienced. When the grid operator has insufficient revenues to cover the required maintenance expenses, it is a threat to the long-term sustainability of the project.

In 2018, a new Electricity Connections Policy 2018–2027 prepared by the Ministry of Energy and Mineral Development (MEMD) became effective. The primary objective of the policy was to increase the electricity access in Uganda. The policy adopted a subsidy approach whereby customers located within a specified distance from an existing LV pole would be required to cover the cost of internal house wiring and inspection fees, while the Government would meet all other charges related to the connection. The goal is to enable more connections faster, increase the number of customers on the network. If successful, implementation of the “free connection policy” could create more revenue for the electricity service providers in time.

High failure rate and outages on the lines

The Rackoko – Lalogi line has had a significant number of outages in the years since commissioning. The % outages per year is provided in the table below. In 2017, the line was out 20% of the time.

Table 10 Outages over the year on the Rackoko – Lalogi line

2014	2015	2016	2017	2018
12%	8%	13%	20%	12%

The outages on the line are normally caused by either a failure on the Rackoko-Lalogi line, or by failure on the Lira-Kitgum feeder line operated by UMEME. The feeder line is old and has a high failure rate.

Both projects have experienced failure of equipment and poles, Rackoko-Lalogi significantly more than Mubende-Kyenjojo. Reasons for the high failure rate could include substandard quality of the lines

constructed, low capacity for operation and preventive maintenance, and limited budgets for operation and maintenance.

During the site visit to Rackoko-Lalogi it was observed that several switches/ breakers had failed and were taken out of operation. Rather than maintaining, the grid operator had contacted REA to have the failures assessed and repaired. Some switches had been out of operation for several years.

It was observed that both cooperatives expected REA to intervene if investments in the grid were required (repairs, new transformers, extensions). Whereas responsibilities for operation and maintenance are defined in the concession lease agreement, interviews indicate that the maintenance responsibility between REA and the Operator is not clearly described, or at least not clearly appreciated by the parties. The high failure rate is a sustainability risk for the projects (technical and in terms of revenues). It is further reinforced if the responsibility and response timelines for maintenance and repairs of the lines is unclear.

Governance of the cooperatives

The two cooperatives (KRECS and PACMECS) had no prior experience with operation of distribution grids when they were established and started operation, and there are several potential sustainability risks related to REA signing a lease agreement with an inexperienced operator. However, the cooperatives appear to have recruited qualified professionals for management and other key positions. The cooperatives have Boards of Directors to which cooperative members are elected and serve a time-limited period. Most of the Board members do not have any previous relevant experience, and this appears to affect how operation and maintenance is prioritized. It was noted through interviews that, at the time, PACMECS had a Board that was not giving operation and maintenance adequately high priority. KRECS had, on the other hand, established a committee to oversee and hold the Board accountable on a regular basis. Proper governance and management of the grid operator is a key element for sustainability of the projects.

Sustainability consideration summary

Professional management, to achieve a high number of connections and increase revenue from electricity sales as basis for sound operation and maintenance, are key elements for a sustainable rural electrification project. It is far from perfect, but KRECS seems to be operating the Mubende-Kyenjojo in a sustainable manner. The sustainability of PACMES operation of the Rackoko-Lalogi line is however highly questionable, mainly due to the low number of connections, high failure and outage rate and governance issues negatively affecting sound operation and maintenance.

5 Conclusion and Recommendations

All eight projects were constructed as planned, commissioned and handed over from REA to the respective concessionaires for operation. The projects have now been five to seven years in operation and have continued to grow their customer base in this period. Several shortcomings in quality, progress and documentation were recorded by the Monitoring Consultant, but in sum the projects have overachieved on the number of connections and achieved their purpose and objectives. Yet, the review has established that there is room for improvement related to (i) quality of the implementation, (ii) inclusion of cross-cutting issues, (iii) cost-efficiency of some projects, and (iv) long-term sustainability with regards to operation and maintenance¹¹.

Recommendations for the Embassy related to the reviewed projects

It is recommended that the Embassy;

- i. Request REA to solve the unpaid retention fee issue and close the final contract (Apala-Kiru);
- ii. Ask for a final financial statement and audit report for both agreements, and repayment of any unspent disbursed funds; and
- iii. Direct REA to prepare final reports as contractually required, including a final update on the wayleave compensation payments.

Recommendations for future Norwegian support to rural electrification in Uganda

The review has established that some of the projects have been very expensive and with unsustainable operational setup. To ensure cost-efficient and effective rural electrification, future Norwegian support could:

- i. Consider off-grid alternatives to grid electrification in rural areas with a low population density. Although the projects have been successful in increasing access to electricity, the challenges related to high costs of supplying poor rural households with limited productive use and demand for electricity are significant for sound operation and maintenance of the grid. Rural systems generally have higher technical network losses and operating costs.
- ii. Focus on strengthening results in areas that have already been electrified with Norwegian support, rather than rural grid expansion in new areas. With time demand grows, and further investments are needed to include more load centres and connect additional customers. The need for expansion and network investments was evident in the site visit to Kyegegwa. The need for additional grid investment to improve reliability and quality of supply was also evident in the site visits. Extensive outages and poor power quality are key factor for low connection growth.
- iii. Take a holistic approach to rural electrification and potentially include:
 - a. Capacity building as part of the support; both to REA for implementation and contract management, and the local grid operators to strengthen operation and maintenance.
 - b. Implementation of development initiatives to stimulate productive use of electricity and job creation in parallel with the rural electrification. A program for stimulation of productive use would typically provide access to information and finance.

¹¹ Only two of the projects were visited as part of the end review, and observations around sustainability of the operations are based on these projects.

Annex A: Project Information

	Apala-Adwari-Kiru	Rakai-Lyantonde-Sembabule	Kabale Kisoro	Mubende-Kyenjojo	Gulu – Adjumani-Moyo	Rackoko-Awere-Lalogi	Myanzi-Kiganda	Muhanga-Rwamucucu-Kisiizi-Kyempe
Employer	REA	REA	REA	REA	REA	REA	REA	REA
Contractor	CPCC International Company (U) Limited	LTL Project (PVT) Limited	A2Z Maintenance and Engineering Services Limited	C&G Andijes Group Limited	C&G Andijes Group Limited	China Jiangxi Corporation	Ferdsult Engineering Services Limited	Ferdsult Engineering Services Limited
Construction Supervision Consultant	Newplan Limited	M&E Associated Limited	Multi Konsults Limited	Multi Konsults Limited	Newplan Limited	Newplan Limited		
Concessionaire	UEDCL, PACMECS	UEDCL	UEDCL	KRECS	UEDCL	PACMECS	UEDCL	UEDCL
Contract price EPC (USD)	3,881,297	8,014,075	6,704,060	7,012,250	8,222,073	2,260,560	1,648,516	3,587,799
Construction start	10 July 2012	29 November 2011	29 November 2011	28 February 2011	11 June 2012	21 June 2012	4 October 2010	4 October 2010
Contract duration	15 months	15 months	15 months	15 months	15 months	15 months		
Contract extension	2 months	3 months	8 months		4 months			
Commissioning	November 2013	July 2013 Lyantonde-Kaliro-	December 2013	February 2013	April/May 2014	April 2014	February 2012	February 2012

		Lwebitakuli March 2014						
Defects Liability Period (DLP)	12 months	12 months	12 months	12 months	12 months	12 months	12 months	12 months
End of DLP	November 2014 (not ended due to outstanding snags)	18 May 2015	12 December 2014	31 st May 2014 (extended from end of January 2014)	May 2015	April 2015	February 2013	February 2013

* Table overview not including addendum

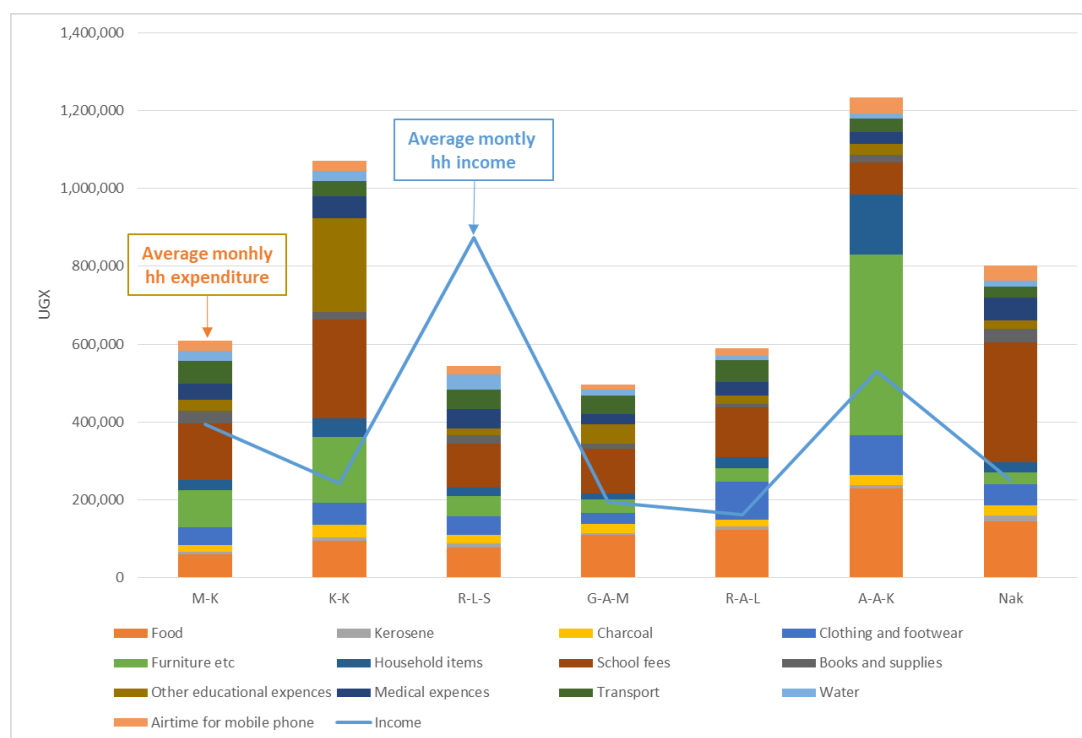
Annex B: Review of the baseline study

The Consultant has conducted a review of the 2014 *Socio-Economic Baseline Studies for Six Rural Electrification Projects* prepared by M & E Associates Ltd, as well as the comments provided by KPMG to the same.

The baseline report covers a great number of indicators, many of which are highly relevant for a rural electrification project. Further, it is noted that the survey sample size (1,109 households, equal to 9.5% of the frame, as well as a large number of businesses and institutions) is substantial.

Unfortunately, the report has a number of inconsistencies and errors that raises serious questions as to the i) methodology/questionnaire, ii) implementation and iii) quality control of the survey. These include:

1. Page 21: The number of «unemployed» reported in table 10 is, on average, in the 60 percent-range. This is clearly not the case, as many of these people will be employed in the informal economy.
2. Page 22: The reported average household income in the R-L-S area is nearly 550 percent higher than that reported around R-A-L. Such a large variance for average incomes in rural areas seems implausible.
3. Page 25: Reported Average Monthly Households Expenditure (table 15) does not correlate with the Average Monthly Household Income (figure 1 on page 22), as seen from the figure below.



4. Page 26: The variance in Prices of Non-locally Milled Products reported in table 17 is surprisingly large. For example, a 330 percent price difference is reported for soy beans between A-A-K and Nak.
5. Page 30: It seems unreasonable that 30 percent of households in R-L-S are affected by ulcers, while 0 percent is reported in R-A-L. Further, it seems implausible that 64 percent of households in Nak are affected by “other chronic diseases”.
6. Page 33: In Table 26 (Average Monthly Expenditure on Energy used in Households) it is reported that the average expenditure on repair of solar home systems in K-K is 5,000 percent higher than the second region on the list.
7. Page 63: The average monthly household expenditure on kerosene per region given in Table 52 (Ability of Households to Pay for Electricity from the Grid) diverges substantially from the average monthly expenditure on kerosene given in Table 15 (Average Monthly Households Expenditure). The two data series are plotted in the figure below.



Without access to the raw data it is not possible to establish whether these inconsistencies and errors are caused by i) insufficient training of enumerators, ii) flaws in the questionnaires/methodology, iii) coding errors, or iv) typing errors in the report. It is clear, however, that the errors are so fundamental and substantial that the baseline study should not be used for analytical purposes.

Annex C: List of people met/ interviewed

	Name	Organization
1	Kristin Wæringsaasen	MFA
2	Elisabeth Clemens	Norad
3	Ørnulf Strøm	Norad
4	Sam Kajoba	Norwegian Embassy
5	Arne Haug	Norwegian Embassy
6	Vegard Willumsen	Multiconsult (former Norad employee)
7	Lars Thurman-Moe	Arthur D. Little (former KPMG)
8	Godfrey Turyahikayo	Executive Director, REA
9	Eng. Joan Mutiibwa	Principal Project Engineer, REA
10	Geoffrey Kasozi	Principal Accountant, REA
11	Eng. John Abouf Turyagyenda	Manager, Project Development, REA
12	Dorothy Orishaba	Assistant Wayleaves Officer, REA
13	Anthony Wamabuya	Sr. Project Engineer - responsible for Northern Uganda, REA
14	Brian Bakonzi	Project Engineer, REA
15	Prince Ronnie Mukombe	Assistant Community Outreach and Communications Officer, REA
16	Dr. Patricia Litio	Principal Community Outreach and Communications Officer, REA
17	Sylvia Birungi	Manager, Connections Department, REA
18	Deborah Nantume	Manager, Service Territory Development and Operations, REA
19	Ojok Cosmas Otukene	Service Territory Engineer, Technical head of dept, PACMECS
20	Ronald Yet	Finance and admin officer, Admin head of dept, PACMECS
21	Matovu Charles	General Manager, KRECS
22	Walter Ngabu	Public Relations Officer / Marketing, KRECS
23	Sowed Gole	Operations Manager, KRECS
24	Musa Susaibi	Board Chairman, KRECS
25	Kirsten Nielsen	PhD researcher, Lalogi trading centre
26	Denise Mbambu	Shop Owner, Bukere Trading Centre
27	Sowedi Sekitoleko	Milling plant owner, Kyegegwa Trading Centre
28	Brian Humprey	Shop owner, Lalogi Trading Centre
29	Harriet Moro	Restaurant owner, Lalogi Trading Centre

Annex D: Semi-structured interview guides

The following semi-structured interview guides were prepared by the Consultant and used to ensure that relevant topics were covered during interviews with stakeholders.

Guide 1: Project visits

Guide 2: REA

Guide 3: Embassy

Guide 4: Distribution Company (DISCO)

Guide 5: Monitoring Consultant

Contractors and Supervision Consultants will be visited if found relevant during the field mission in Uganda (to collect additional information, or if Embassy/ REA/Monitoring Consultant is unable to provide requested documentation).

Guide 1: Project visits

1. Meet distribution company (DISCO) with concession to operate the line (guide 4)
2. Drive line route for visual observations of the line
3. Meet local leaders in some electrified villages/ trading centers
 - a. *Experience with the electrification process*
 - i. *Information to potential customers (procedures, requirements, cost, etc.)*
 - ii. *Compensation and follow up of people/ property affected by the project*
 - b. *Customers and economic activity stimulated by electricity in the village*
 - c. *Other notable issues related to electricity supply in the village?*
4. Meet random electricity customers (male/female - commercial, institutional, residential)
 - a. *Use of electricity? Benefits and challenges (consumption, cost, equipment, etc.)*
 - b. *Experience with DISCO (provision of services, customer handling, information)?*
 - c. *Information pre connection? Information on PUE?*

Guide 2: Rural Energy Agency

Topic	Issues/questions
Program Management	1. Overview of contracts entered by REA under the Agreement(s) 2. How was REA organized to manage the Agreement(s) and sub-contracts entered (organizational setup, roles and responsibilities)? 3. Was REA program management setup adequate (capacity, competence, budget)? 4. How has program management worked with risk management in practice during planning and execution? 5. Experience with and performance of supervision consultants (construction supervision, reporting, site presence, etc.) 6. Experience with and performance of monitoring consultant (relevance and follow up of advice) 7. Archiving and document control
Connections	8. Number of connections (year by year, broken down on consumer categories) for each project 9. How are new connections reported to and verified by REA? 10. What public awareness/ information sharing was done to stimulate connections and PUE? 11. REA setup and procedures for information sharing and public education? 12. Connection subsidy in the project and after end of construction 13. Cost per connection for other REA Uganda projects?
Wayleave compensation	14. Valuation done and valuation report approved. Have compensation been paid to all claimants? 15. If so, we need proof of payment and proof of receipt of compensation funds by the beneficiaries 16. To what degree did unplanned line alignment/ changes make construction more expensive (longer route, higher wayleave compensation)? 17. What is REAs planned strategy towards compensation payments in future? (Ref Newspaper article where REA sought for waiver against compensation payments for REA projects).
HSE and Crosscutting issues	18. Were Environmental Management Plan and project specific plans prepared? 19. How was management of HSE/ E&S risks during construction phase organized; including division of responsibilities between REA and the Contractors? 20. HSE/ E&S reporting requirements between NEMA-REA and REA-Contractors? 21. Have annual monitoring reports to NEMA been submitted? Copy of last year of construction if available 22. Was a grievance mechanism for local communities during construction established? Copy of grievance record if available 23. What has been done to integrate the gender perspective across the projects? (in awareness campaigns, planning, construction, subsidy schemes, monitoring) 24. What would REA do differently to integrate gender in future rural electrification projects? 25. The risk of bush fire damaging the infrastructure has been lifted as a potential sustainability risk. What has been the extent of bush fires damaging infrastructure?

Topic	Issues/questions
Capacity building	26. To what degree does REA have capacity and competence to manage construction projects/ oversee construction supervision consultants? 27. Have there been capacity building efforts as part of the two Agreements financed by Norway? 28. To what degree should capacity building be considered as part of future rural electrification projects?
Reporting and Monitoring	29. Submission of Annual Reports, Final Reports and Final Audit Reports 30. Request details on selection of concessionaire and concession monitoring 31. What is REA role after DLP/ concessionaire take-over? Monitoring of concession and connections. Operation and maintenance. 32. How have snags remaining after end of DLP been handled (project specific)?
Relevance and other initiatives	33. What are current GoU priorities and national plans for rural electrification development? 34. What is the current REA rural electrification portfolio and split external/national financing? 35. To what degree has the Program been coordinated with other, similar electrification efforts (synergies, overlaps, WB output based aid)?
Lessons	36. The mid-term review noted that the connection uptake was slow and recommended initiatives for improved communication. The MTR also came with some technical recommendations (capacity banks in northern projects, among other). To what degree have MTR recommendations been addressed? 37. What are main lessons learnt that will be taken forward in future electrification projects?

Guide 3: The Norwegian Embassy

Topic	Issues/questions
Program Management, Reporting and Monitoring	1. Structure of Agreement follow up (Embassy – monitoring consultant) 2. Submission of Annual Reports, Final Reports and Final Audit Reports 3. Experience and performance of REA managing the Agreements? To what degree does REA have the right capacity and competence to manage the Agreement and construction projects? 4. Quality and completeness of annual reporting and audited financial reporting? 5. Experience with and performance of monitoring consultant? 6. The monitoring consultant contract set a 23 million NOK budget cap. How much has the Embassy disbursed? 7. To what degree has REA upheld their part of the Agreements (wayleave compensation, public education, connections)
Relevance, lessons and future support	8. What are current Embassy priorities/ plans relevant for rural electrification support in Uganda? 9. To what degree has the Embassy coordinated with other Development Partner and shared experience (synergies, overlaps, WB output-based aid)? 10. The mid-term review noted that the connection uptake was slow and recommended initiatives for improved communication. The MTR also came with some technical recommendations (capacity banks in northern projects, among other). To what degree has the Embassy followed up using the MTR recommendations? 11. Capacity building appears to have been limited in the projects. To what degree could capacity building have been part of the projects, and what are lessons learnt? 12. What are main lessons learnt that should be taken forward in future electrification projects?

Guide 4: Distribution Company (DISCO)

Topic	Issues/questions
Key data	1. Key data (concessions/ infrastructure/ financials/ number of staff, strategy and business plans, number of customers, performance/ losses, operation and maintenance procedures, capacity and competence)
Connections	2. Number of customers (for the projects, year by year, broken down on categories) 3. Procedures for new connections? 4. Strategy and approach to get new customers? Are connections still subsidized? 5. Technical quality of lines? Major issues? 6. Relation to REA/ concession monitoring 7. O&M; routines, financing, etc.

Guide 5: Monitoring Consultant

Topic	Issues/questions
Role and Contract	1. Scope and period of the monitoring contract? 2. To what degree did the monitoring in practice cover both Agreements 0021 and 0039? 3. Reporting and monitoring schedule? Frequency of site visits? 4. When did the contract/ reporting end? (Q4 2015 latest progress report available) 5. Role vis-à-vis REA and supervision consultants? 6. Database/ document control?
Construction supervision	7. Experience/ performance of REA as Employer for EPC Contractor? 8. Experience/ performance of supervision consultants? Quality? Reporting? Site presence? 9. Value added from monitoring consultancy in construction phase? 10. Did monitoring continue post DLP? Outstanding technical snags appear to remain after end of DLP 11. Financial reporting until when? Outstanding issues
Connections	12. What was the source of connection figures reported by KPMG? How did KPMG confirm connection information provided by REA/ Concessionaire? 13. How are new connections reported to and verified by REA? 14. To what degree was REA's public awareness/ information sharing to stimulate connections and PUE done? And, was it effective? 15. Experience with the connection subsidy arrangement in the project?
Wayleave	16. What were major issues around wayleave compensation payments? 17. To what degree did unplanned line alignment/ changes make construction more expensive (longer route, higher wayleave compensation)?
HSE and Risk	18. Were Environmental Management Plan and project specific plans prepared? 19. To what degree was the stakeholders' management of risks, HSE/ E&S compliance and grievances checked/ monitored by KPMG during the construction phase? 20. Experience with contractors handling of HSE, and supervision consultants follow up? 21. What was done to integrate the gender perspective across the projects? (in awareness campaigns, planning, construction, subsidy schemes, monitoring). How was it monitored?
Sustainability	22. How does the Monitoring Consultant consider competence level (training needs) of REA and possible also DISCOs? 23. To what degree was KPMG advice followed up by REA and the other stakeholders in the Program?

Annex E: List of documents reviewed

No.	Documents
Planning and Decision Documents (Feasibility, Application, Appraisal, Program Documents)	
1	Feasibility studies for rural electrification grid extension projects (Lira-Kotido, Gulu-Moyo-Adjunani, Parak Mission-Awere, Mubende-Kyenjojo, Kabale-Kisoro, Rakai-Lyantonde-Lwemiyaga), including market surveys and environmental and social project briefs, Power Networks (U) Limited in association with SWEKO, August 2010
2	Programme Document, Application for funding from the Royal Kingdom of Norway, REA, Revised July 2011
3	Application for additional funds for the implementation of works under the two rural electrification projects (UGA 10/0021), REA, September 2014
4	Application for additional funds for the implementation of works under the rural electrification projects (UGA 10/0039), REA, September 2014
5	Appraisal of 6 Rural Electrification Projects in Uganda, Final Report, Norplan, June 2011
6	Addendum to appraisal: Reassessment on the three northern projects, Norplan/ Norad, 30 September 2011
7	Comments on the final socio-economic baseline study report for the six rural electrification projects, KPMG, February 2014
8	Socio-economic baseline studies for six rural electrification projects, Final report, M&E Associates Limited, May 2014
9	Decision documents for Agreement UGA 10/0039, Norwegian Embassy, signed 27 July and 5 December 2011
10	Gender mainstreaming in rural electrification projects in Uganda: Initial scoping mission, ENERGIA International Network on Gender and Sustainable Energy, September 2011
Agreements	
11	Agreement between the Norwegian Ministry of Foreign Affairs (MFA) and the Government of the Republic of Uganda (Uganda) regarding development cooperation concerning support to construction of three rural distribution grid projects, signed 29.07.2011, including addendums
12	Agreement between the Norwegian Ministry of Foreign Affairs (MFA) and the Government of the Republic of Uganda (Uganda) regarding development cooperation concerning implementation of two rural electrification projects, signed 04.06.2010, including addendums
13	Consultancy Assignment Agreement Part I governing the delivery of Monitoring Consultancy between KPMG AS and the Royal Norwegian Embassy in Kampala, contract period 2 May 2012 to 31 December 2013
14	Contract between The Government of the Republic of Uganda represented by the Rural Electrification Board and LTL Projects (PVT) Limited in relation to the construction of 33kV power lines and associated low voltage networks [...], signed 17 November 2011
15	Contract for the provision of Consultancy Services between The Government of the Republic of Uganda represented by the Rural Electrification Board and Newplan Limited for construction supervision and contract management of 33kV high voltage power lines and associated low voltage networks in [...], signed 27 November 2012
Status and Progress Reports	
16	Reports from Monitoring Consultant/ KPMG: • Various site visit reports • Various Quarterly reports on the monitoring of the Uganda Power Sector Projects

	• Status of the Norwegian funded projects implemented by the REA as at 31 May 2014, July 2014 • Independent Monitoring Consultancy, Uganda Power Sector Projects, Status update as at 21 April 2015 • Monitoring of the Uganda Power Sector Projects for remaining Agreement period, February 2016 • Project Closure Reports for all six rural electrification projects implemented by REA, October 2016,
17	Reports from REA: • Annual Reports (2013, 2014, 2016), REA • Minutes of annual meetings (2013, 2014, 2015) • Status report for the implementation of works under the rural electrification projects, June 2014
18	Mid-term review of the construction of six rural distribution lines, KPMG, April 2014
19	Hand Over Note, Clean Energy Portfolio, Norwegian Embassy, August 2014
20	Report of the Auditor General on the Financial Statements of the Energy for Rural Transformation Project II (funded by the Government of Norway) for the year ended 30 th June, 2016, Office of the Auditor General, December 2016
Project Documents	
21	Mubende-Kyenjojo project: • Status and progress report on the Mubende-Kyenjojo 33kV power line, KRECS, 21 August 2019 • Energy loss strategy 2018-19, KRECS, 2019 • Operation and maintenance plan 2019, KRECS • Single-line diagram Mubende-Kyenjojo
22	Rackoko-Lalogi: • Outage records, PACMECS • Field report from Lalogi on state of power supply and uses of electricity, Kirsten Nielsen (PhD student based in Lalogi), July 2019
23	UEDCL lines: • Customer connection data for Norwegian funded lines
Other Rural Electrification Resources	
24	Impact assessment of rural electrification project in Mozambique, Final report, Norplan, October 2013
25	Unit Costs of Infrastructure Projects in Sub-Saharan Africa, Africa Infrastructure Country Diagnostic, Background Paper, World Bank, 2009
26	Electricity connections policy 2018-2027, Ministry of energy and mineral development Uganda

Annex F: Terms of reference

End Review of Implementation of two rural electrification projects UGA 3049 10/0021 Support to construction of six rural distribution projects UGA 3049 10/0039 and Identification of potential new rural electrification projects in cooperation with the Rural Electrification Agency (REA)

1. Background

Background on Norway-Uganda cooperation in general and with REA in particular

Over the years, Norway through the Embassy in Kampala has provided substantial support to Uganda's power sector. The choice of intervention was based on Norwegian competence and areas where it was believed that Norway could add value (additional information can be found in the Embassy's Action Plans for the years 2009-2012 and "Innsatsprogram for ren energi" from 2009).

The clean energy portfolio has included financial support for feasibility studies, the construction of transmission lines, capacity building, increased/accelerated investments in renewable power production, and rural electrification through the Rural Electrification Agency (REA).

Background on the specific projects and contracts (including agreements and addendums)

i. UGA-10/0039 Six Rural Electrification Projects

The Norwegian Ministry of Foreign Affairs (MFA) and the Government of Uganda (GoU) entered into an agreement to finance the Feasibility Study of six rural electrification projects on 15 July 2009 with REA as the implementing institution. The project was undertaken in 2010 and the Final Report received 12 July 2012. Upon completion of the feasibility studies, REA submitted a request and a proposal to the Embassy for financial support towards the construction of the six rural electrification distribution lines.

External project appraisal of REA's proposal concluded that that three Northern Uganda projects in REA's request/application were not economically viable. As such, the Embassy initially agreed (*Agreement UGA 10/0039 dated 29th July 2011*) to support the three projects in Central and South-Western Uganda districts of Mubende – Kyenjojo, Kabale – Kisoro and Rakai – Lyantonde - Sembabule. The scope of the three projects included the construction of approximately 550 km of medium voltage lines and associated low voltage distribution networks. It was also anticipated that approximately 15,000 potential customers would be connected and have access to electricity within 5 to 10 years after commissioning (3000 within year one of commissioning). The support was towards financing consultancy, construction, and equipment supply for the erection of 33 kV distribution grids to the three rural areas.

Following a reappraisal and revision in the scope of the three Northern Uganda rural electrification projects of 1) Apala - Adwari –Kiru, 2) Rackokoko – Awere - Lalogi and 3) Gulu – Adjumani – Moyo, the embassy signed an addendum to the Agreement UGA-10/0039 on 6th December 2011, to include the said Projects. The additional scope included construction of approximately 420 km of medium voltage lines (33 kV) and associated low voltage distribution networks. It was also anticipated that approximately 7000 potential customers would get connected and have access to electricity within 5 to 10 years after commissioning (2700 within one year of commissioning). There were also some existing customers in the area already connected to a diesel generator grid that were expected to shift to the new and cheaper grid power.

The terms and procedures for MFA's support to the construction of these rural distribution lines were outlined in the above-mentioned Agreement and the Addendum No.1, including the Revised Agreed Programme Summary in Annex I. The project is further described in the Programme Document "Rural Electrification Agency, Ministry of Energy and Mineral Development, Revised Programme Proposal, Application for funding from the Royal Kingdom of Norway", dated November 2011. The total budget was NOK 196 mill for the planned period 2011 – 2014.

The Project goal as stated in the said Agreement and addendum was to meet the rural population's need for improved economic and social development in a sustainable way through increased access to affordable electricity services. The specific purpose of the project as stated in the Agreement was to extend power from the national grid to district headquarters, administrations, businesses, production units, and households, not yet served by the grid.

In 2014, the Government of Uganda (GoU) requested a no-cost extension, and at the same time presented an application to utilise the remaining unutilised funds amounting to NOK 12.14 million for implementation of additional works that included the following components:

- Additional Scope under the ongoing component: Gulu-Adjumani-Moyo with a T-off to Amuru
- Additional Scope under the ongoing component: Apala-Adwari-Kiiru with a T-off to Morelem
- Additional Scope under the component: Rackokoko-Awere-Lalogi
- Additional scope under the component: Kabelo-Kisoro
- Additional Scope under the component: Rakia-Sembabule
- Additional Scope, i.e. funds, for the Supervision Consultant.

Addendum No.2 to the Agreement UGA-10/0039 was entered into, extending the Agreement period by one year to December 2015 and allowing the use of the remaining funds to implement additional works within the footprint of the Project areas. A Revised Agreed Programme Summary providing details of the scope of additional works was comprised in Annex 1 to Addendum No.2.

ii. UGA-10/0021 Two Rural Electrification Projects

The grant Agreement for support of two rural electrification projects was signed 4th June 2010 with total budget of NOK 35.1 million. The Goal of the Project was to meet the rural population's need for improved economic and social development in a sustainable way, and the Purpose of the Project is stated as 'to achieve an improved livelihood through access to electricity in rural areas'. The scope included construction works, procurement and detailed design of the two projects comprised in i) Myanzi to Kiganda; and ii) Muhanga to Kyempene with tee-offs. Refer to the Agreement UGA-10/0021 Annex 1: Agreed Project Summary for the detailed description of the Project.

An Addendum was entered into on 28th July 2011 to include additional areas with additional funding of NOK 1.6 million budget.

Addendum 2 was entered into 28th June 2012 for subsidisation of 9,197 consumer connections in the Project area with a budget of NOK 10.2 million. The goal was stated as 'to contribute to the social – economic development of the rural population through increased customer connections to grid electricity services. The purpose was stated as to facilitate customer connections to grid electricity services. Refer to the Addendum 2 Annex 1; Revised Programme Summary for a detailed description of the project.

In 2014 the Government of Uganda (GoU) made a request to utilize the balance of funds upon completion of project activities under Agreement UGA-10/0021, amounting to NOK 2,362,032/- (unutilised funds) for implementation of additional works under the two rural electrification projects.

The Embassy granted the request and agreed that the outstanding balance of funds be utilised in the period December 2014 – June 2015 to implement additional works on Muhanga – Rwamucucu – Kisiizi – Kyempene with a tee-off to Rugyeyo as further described in the revised Agreed Programme Summary – Annex 1 to the Addendum 3 dated 19th November 2014.

Summary of project agreements and addendums

UGA-10/0021

29.07.2011	Agreement	3 southwestern t-lines	NOK 112m
06.12.2011	Addendum	3 Northern t-lines	NOK 84m
	Total	6 t-lines	NOK 196m

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UGA-10/0039

04.06.2010	Agreement	2 t-lines	NOK 35.1m
05.08.2011	Addendum	Extension of scope	NOK 1.6m
28.06.2012	Addendum 2	Connection subsidies	NOK 10m

19.11.2014	Addendum 3	No-cost extension	
	Total	2 t-lines & connections	NOK 46.7m

2. Purpose

The assignment has two purposes:

1. Assess whether the projects have fulfilled objectives set in the Agreements with Addendums including the financial management of the projects.

The review shall follow-up on and build on (provide added value to) the mid-term review (MTR) of the Construction of the six rural distribution lines by KPMG and tease out lessons learned.

The project impact shall be elaborated by using the Baseline study from 2013 as point of departure.

The most important aspects as elaborated under Scope of work.

- Relevance and impact
- Effectiveness and cost efficiency
- Particular technical issues

2. In close cooperation with REA and the Government of Uganda's policies and plans, identify and suggest new potential cooperation projects within rural electrification, which will improve livelihood through access to electricity in rural areas.

3. Scope of work

3.1 End Review

The end review shall assess, but not necessary be limited to the following issues or items:

Relevance

- Assess the local ownership of the project, and to which extent the project is implemented according to the priorities of the Government of Uganda. Hereunder also assess the degree of national co-financing, compared to relevant examples from other bilateral and multilateral donors.
- Assess to which extent the project was in accordance with relevant priorities and governing principles for the Norwegian energy development aid at the time the project(s) was developed
- Assess the achievements of the support compared to the purpose and objectives as set forth in the Agreement between Uganda and Norway.

Impact

- Give an assessment of the projects' impact in relation to the stated goal of the project, including:
 - An overall assessment of the projects' impact on livelihood and development in the grid-connected areas.
 - Assess to which extent the projects have resulted in increased economic growth and job creation

Effectiveness

- Assess the effectiveness of the project, i.e. to what extent has the outputs and the immediate objectives as defined in the agreement and the addenda been achieved.
- Examine to which extent the number of new connections and the increased load resulting from the project(s) are in line with the project plans.

Efficiency and progress

- Assess to which extent the project organization and the division of roles and responsibilities has been appropriate for efficient project execution, hereunder also the performance and presence of the subcontracting consultants, in comparison with other relevant projects funded by Norway in Sub-Saharan Africa.
- Assess the relevance of the Embassy's monitoring consultant (KPMG) and to which extent their reports were followed up and implemented in the project.
- Assess the progress of the projects and examine to which extent milestones have been met and deliverables completed in due time.
- Examine to which extent the contractual requirements and obligations connected to procurement and audits are met.

- Assess to which extent the project has been implemented in a cost-efficient manner, considering the outputs/results against the input factors (funds and human resources)
- Compare the cost efficiency of this project to other, relevant projects. Hereunder assess also the unit costs per km lines, in comparison to relevant benchmarks from Uganda and relevant/comparable countries.
- Assess the connection costs per customer.
- Assess the quality of the analysis behind the budget and examine reasons for any budget overruns. Suggest measures that could have improved the quality of the budget.

Risk management and cross cutting issues

- Assess the risk management systems in the project. Hereunder assess to which extent the risk management system was designed to handle the risks that did materialize, and how unforeseen events (substantial events not included in the risk management system) was handled
- There are four cross cutting issues in the Norwegian development cooperation:
 - Assess the projects impact on environment and climate
 - Assess the projects impact on gender and women's rights.
 - Assess the projects' impact on and potential violation on human rights
 - Assess any anti-corruption measures which have been implemented as part of the project

Particular issues and technical aspects

- Assess whether wayleaves compensation has been paid to affected persons.
- Assess to what extent bush fires has destroyed poles and disrupted electricity supply.
- Assess the quality of the distribution lines.
- Assess how Health, Environment and Safety (HES) has been handled during the construction of the distribution lines.

Potential new projects

Identify and suggest together with REA new potential rural electrification projects (2 – 3 scenarios) with the goal to meet the rural population's need for improving economic and social development in a sustainable way. Alignment and coordination with Norway's already constructed distribution lines as well as other donors' involvement in the rural electrification sector is important.

4. Implementation of the Assignment

Methodology to be applied

The End review shall partly be done as a desk study assessing background material and documentation and partly as fieldwork in Uganda. The review team shall make themselves familiar with all relevant and available background information, such as the project documents, the agreements, addendums, the decision documents, annual reports, minutes from the annual meetings, KPMG reports, reports produced under the programmes, etc.

The team is expected to have extensive meetings with stakeholders, counterparts, development partners (including REA, Ministry of Energy and Mineral Development, Ministry of Finance, Planning and Economic Development, Norad, KPMG, and other partners) providing relevant input for the end-review.

Start-up meetings with Norad and with Royal Norwegian Embassy in Kampala and REA on arrival, as well as a wrap-up meeting prior to the departure from Uganda shall be included.

The team should also carry out a site visit to at least two of the distribution lines.

Review Team and Qualifications

The End Review and Appraisal will be undertaken by a Review Team consisting of the following members:

- Team leader: Technical expert (international)
- Team member: Technical expert (local/regional)
- Team member: Environmental and Social Impact Assessment (ESIA) expert (international)
- Team member: Financial/procurement expert (international)

The Consultant is free to propose any of the international team members as team leader (for example, the ESIA expert can also be the team leader).

Qualifications: Team leader

- Experience leading project teams necessary

- Minimum 10 years of experience with transmission and distribution necessary
- Experience from similar reviews in developing countries in the region, preferably from Uganda
- Profound knowledge of Master Plans and implementation of rural electrification projects
- Strong analytical and communication skills
- Advanced report writing skills
- Technical insight in electrical transmission and distribution

Qualifications: International technical expert

- Technical expertise within electrical transmission and distribution
- Knowledge of relevant international standards
- Experience from similar reviews of projects funded by international donors in the region, preferable in Uganda
- Good report writing skills

Qualifications: Local/regional technical expert

- Technical expertise within electrical transmission and distribution
- Insight in Uganda's framework conditions for electrification and T&D
- Thorough knowledge, academic qualifications, experience and understanding of the legal, technical and regulatory framework of Uganda
- Thorough knowledge of Ugandan public procurement rules
- Experience from similar reviews of projects funded by international donors in the region
- Good report writing skills

Qualifications: Environmental and Social Impact Assessment (ESIA) expert

- Thorough knowledge of domestic and international good practice and safeguards important for environmental & social aspects in connection with construction of distribution lines
- Insight and knowledge of Ugandan wayleaves compensation
- Experience from similar reviews of projects funded by international donors in the region
- Good report writing skills

Qualifications: Financial/procurement expert

- Strong knowledge in assessing financial management, procurement and anti-corruption systems
- Familiar with cost/benefit analysis
- Experience from similar reviews of projects funded by international donors in the region
- Good report writing skills

The Consultant shall be independent of the activities to be reviewed and shall have no stake in the outcome of the review.

Timetable for preparation, field work and reporting

The assignment is to be conducted in the second and third quarters of 2019. The work shall include an 8-10 work-days field work mission to Uganda including return travel. The available budget may set limitations on the field work regarding number of participants and/or duration of travel for individuals.

The Consultant will be responsible for the following deliverables:

- Mission Preparation Note and proposed Table of Content (ToC), to be delivered before field mission
- Presentation to the Embassy in Kampala and the government at the end of field mission
- Presentation to the Embassy in Kampala and Norad the proposed projects for assessment
- Draft report, 2 weeks after return from field mission
- Final report, 1 week after return of Government, Embassy and Norad's comments to draft report.

The final report shall be no longer than 35 pages and be delivered in .doc and .pdf format.

Contract value

The Consultant will be reimbursed by the hour. The total contract value including travel expenses and other expenditures must not exceed NOK 650 000 excl. MVA, including field visit to Kampala and relevant sites to be determined in consultation with the Embassy and REA. Travel expenses will be reimbursed based on invoice of accrued expenditures. Travel costs should be based on economy class travels.

Annex I: List of reference documents

- Embassy's Action Plans for the years 2009-2012
- "Innsatsprogram for ren energi" (2009)
- REA Strategy (2013)
- Feasibility reports
- External appraisal
- Re-appraisal
- Agreement UGA 3049 10/0039
 - Addendum
- Agreement UGA 3049 10/0021
 - Addendum
 - Addendum 2
 - Addendum 3
- Annual reports (KPMG)
- Monthly reports (KPMG)
- Annual meeting minutes
- Audit reports
- Social –Economic Baseline Studies for six rural electrification projects by M&E Associates Ltd, 2013.
- Gender mainstreaming in rural electrification projects by Energia (International Network on Gender and Sustainable Energy)
- Independent Monitoring Consultant – MFA entered into an agreement with the consulting company KPMG 8 May 2012 with the objective to monitor amongst other the GoU's implementation of these distribution lines with regard to procurement, finance management and results during the planning and execution of the design and construction work. As part of this agreement, KPMG has also carried out several site visits.
- Mid-Term Review of the Construction of six rural distribution lines – KPMG, April 2014

Annex II: List of relevant stakeholders

The embassy will provide a complete list of relevant stakeholders and their contact details and will provide support to the consultant to set up meetings and transport where necessary.