

TECHNICAL & FINANCIAL FILE

ENERGY SECTOR

IMPROVING ACCESS TO RELIABLE ON-GRID ELECTRICITY SERVICES FOR HOUSEHOLDS, BUSINESSES AND PRIORITY PUBLIC INSTITUTIONS

BELGIAN CONTRIBUTION TO EARP – COMPONENT 3 –
BE3EARP

RWANDA

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THE BELGIAN
DEVELOPMENT COOPERATION **.be**

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ABBREVIATIONS

AFD	Agence Française de Développement
AfDB	African Development Bank
BADEA	Arab Bank for Economic Development in Africa
BE	Kingdom of Belgium
BE1EARP	Belgian Contribution to the Electricity Access Roll Out Program – Component 1
BE2EARP	Belgian Contribution to the Electricity Access Roll Out Program – Component 2
BE3EARP	Belgian Contribution to the Electricity Access Roll Out Program – Component 3
BTC	Belgian Technical Cooperation
CB	Capacity Building
CBF	Capacity Building Fund
CDEU	Institutional Strengthening and Capacity Development of the Electricity Utility
CNA	Capacity Need Assessment
CPPR	Cooperation Portfolio Performance Review
DGD	Directorate General for Development Cooperation and Humanitarian Aid
DI	Director of Intervention
DP	Development Partners
EA	Environmental Assessment
EC	European Commission
EARP	Electricity Access Roll-out Program
EDCL	Energy Development Corporation Limited
EDPRS	Economic Development and Poverty Reduction Strategy
EMP	Environmental Management Plan
EPC	Engineering, Procurement and Construction
ESMF	Environmental and Social Management Framework
ESSP	Energy Sector Strategic Plan
eSWAp	Energy Sector Wide Approach
eSWG	Energy Sector Working Group
EUCL	Energy Utility Corporation Limited
FDI	Foreign Direct Investment
GDP	Gross Domestic product
GIS	Geographic Information System
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoR	Government of Rwanda
GTF	Global Tracking Framework
HH	Household
HR	Human Resources
HV	High Voltage
IBMS	Integrated Business Management System
ICP	Indicative Cooperation Program
ICT	Information and Communication Technology

IMF	International Monetary Fund
IT	Information Technology
ITA	International Technical Assistance
JICA	Japan International Cooperation Agency
kWh	Kilo Watt Hour (unit of energy)
LV	Low Voltage
M&E	Monitoring and Evaluation
MINAFFET	Ministry of Foreign Affairs and Cooperation
MINALOC	Ministry of Local Government
MINECOFIN	Ministry of Economic Planning and Finance
MINEDUC	Ministry of Education
MININFRA	Ministry of Infrastructure
MINIRENA	Ministry of Environment and Lands
MIS	Management Information System
MOH	Ministry of Health
MoM	Minutes of Meeting
MoU	Memorandum of Understanding
MTR	Mid Term Review
MV	Medium Voltage
NCBS	National Capacity Building Secretariat
NCST	National Commission for Science and Technology
NGO	Non-Governmental Organization
NIRDA	National Industrial Research and Development Agency
NL	The Netherlands
OECD	Organisation for Economic Co-operation and Development
OFID	OPEC Fund For International Development
O&M	Operation & Maintenance
OP	Operational Policy
OPEC	Organization of the Petroleum Exporting Countries
PAPs	Project Affected People
PIN	Project Identification Note
PIU	Project Implementation Unit
PM	Project Manager
PMO	Prime Minister's Office
PMU	Project Management Unit
PSC	Project Steering Committee
PSI	Policy Support Instrument
PSPE	Private Sector Participation in the generation of Electricity from renewable sources
PV	Photovoltaic
QCC	Quality Control Committee
RAF	Responsible for Administration and Finance

RAP	Resettlement Action Plan
RBS	Rwanda Bureau of Standards
RDB	Rwanda Development Board
REG	Rwanda Energy Group
REMA	Rwanda Environment Management Authority
RES	Rural Electrification Strategy
RESSP	Rwanda Electricity Sector Strengthening Project
RPF	Resettlement Policy Framework
RPPA	Rwanda Public Procurement Authority
RoW	Right Of Way
RURA	Rwanda Utilities Regulatory Agency
SCBI	Strategic Capacity Building Initiative
SE4ALL	Sustainable Energy For All
SEA	Strategic Environmental Assessment
SEDP	Sustainable Energy Development Project
SME	Small and Medium Enterprise
SoV	Source of Verification
SPIU	Single Project Implementation Unit
SREP	Scaling Up Renewable Energy in Low Income Countries Program
SWAp	Sector Wide Approach
SWG	Sector Working Group
TA	Technical Assistance
TFF	Technical and Financial File
ToR	Terms of Reference
TWG	Technical Working Group
UN	United Nations
WB	World Bank

EXECUTIVE SUMMARY

The Indicative Cooperation Program (ICP 2011-2014) between Belgium and Rwanda allocates a total grant envelope of 49 million euro to the energy sector in Rwanda. The present document covers the scaling-up of the grid access to energy component with a Belgian contribution of 10 million EUR and a duration of 4 years.

The general objective of this intervention is the provision of sufficient, reliable and affordable energy for all Rwandans. Its specific objective is to improve the access and use of reliable on-grid electricity services for households, businesses and priority public institutions in rural Rwanda. The intervention should be seen as the third component of the Belgian contribution to the nationwide Electricity Access Roll-out Program (BE EARP).

In this third phase, the focus is shifted from extending the grid and connecting new households and businesses towards upgrading the existing grid. Grid upgrade activities will decrease technical losses and serve an increasing demand with an improved grid reliability and power quality. These aspects are considered crucial for the clients (especially businesses relying on electricity), as well as for the utility, who will see its costs decrease and revenue increase. The choice of upgrades will be based on a thorough needs assessment and feasibility analysis, using technical and economic analysis for ranking priorities.

In addition, the present intervention will build capacity at the partner institution (EDCL/EARP), by providing technical assistance and by financing staff within the institution, in order for them to be able to implement this program and future programs.

The intervention will be implemented in joint responsibility between the Energy Development Corporation Limited (EDCL), part of the Rwanda Energy Group (REG) and the Belgian Technical Cooperation (BTC). The project team in place for the first 2 components of the Belgian contribution to Electricity Access Roll-out Program (BE1EARP & BE2EARP) will be complemented to implement all three components simultaneously.

ANALYTICAL RECORD OF THE INTERVENTION

Title of the intervention	Improving Access to Reliable On-Grid Electricity Services for Households, Businesses and Priority Public Institutions – Component 3
Intervention number	NN 3017540
Navision Code BTC	RWA 15 095 11
Partner Institution	Ministry of Infrastructure - MININFRA Rwanda Energy Group - REG
Length of the intervention	48 Months
Duration of specific agreement	60 Months
Estimated date of start from the intervention	2016
Rwandan Contribution	Estimated at € 2,000,000
Belgian Contribution	€ 10,000,000
Sector (DAC codes)	Main sector : 23040 Energy – Electricity transmission and distribution Sub-sector : 23010 Energy – Energy policy and management
Brief description of the intervention	The project aims at stimulating economic growth and creating jobs by supporting and sustaining progressive and improved access to electricity for numbers of households, businesses and priority public institutions in urban, peri-urban and rural areas.
Global Objective	The Energy Sector is able to provide sufficient, reliable and affordable energy for all Rwandans.
Specific Objective	The access to reliable on-grid electricity services for households, businesses and priority public institutions in urban, peri-urban and rural areas is improved.
Results	<ol style="list-style-type: none"> 1) Electricity supply is improved by grid upgrade activities 2) EDCL capacity in planning, supervision and contract management is strengthened

1 SITUATION ANALYSIS

1.1 The ICP between Belgium and Rwanda

The Indicative Cooperation Program (ICP 2011-2014) between Belgium and Rwanda, approved on May 18th 2011, allocates a total grant envelope of 55 million euro to the energy sector in Rwanda, split over 4 interventions:

1. Improving access to reliable and cost effective electricity services for households and priority public institutions – Belgian contribution to Electricity Access Roll-Out Program EARP (€17M)
2. Institutional Strengthening and Capacity Building (€5M)
3. Increasing electricity supply through development of geothermal energy (€27M)
4. Encouraging private sector participation in the generation of electricity from renewable sources, through the establishment of adequate Feed-in-Tariffs (€6M)

The interventions (1) and (2) were formulated in 2013 and started in 2014.

Following a joint decision taken by Rwanda and Belgium to reallocate the funds of the geothermal component (3), the Cooperation Portfolio Performance Review (CPPR) meeting of December 17th 2014 agreed to split the € 27M in three smaller interventions. One intervention of € 5M focused on the forestry sector and two other interventions for a total of € 22M were allocated to energy roll-out within EARP. After a policy review by the Belgian government and subsequent negotiations with GoR, the energy portfolio, for a total of 49M€, is organised as follows :

- i. Improving access to reliable on grid electricity services for households and priority public institutions – Component 1 – BE1EARP (€ 17M)
- ii. Improving access to reliable on grid electricity services for households and priority public institutions – Component 2 – BE2EARP (€ 12M)
- iii. Improving access to reliable on grid electricity services for households, businesses and priority public institutions - Component 3 – BE3EARP (€ 10M)**
- iv. Institutional strengthening and capacity development of electricity utility – CDEU (€ 5M)
- v. Forest Management and Support to woody Biomass Energy – FMBE (€ 3M)
- vi. Private sector participation in the generation of electricity from renewable sources - PSPE (€ 2M)

The present document formulates the third access to energy component (iii). Synergies with the other components will be sought (see chapter 2).

1.2 The general policy context for the Energy Sector

1.2.1 The macroeconomic policy context

Rwanda successfully completed the third review under the second generation of the non-financial program with the International Monetary Fund (IMF), the Policy Support Instrument (PSI). Through the PSI the Government of Rwanda is committing to maintaining macroeconomic stability and sustaining rapid and inclusive growth over the medium term. With Rwanda's risk of debt distress having improved from "moderate risk" to "low risk", the IMF's PSI provided for flexibility to issue US\$250m in non-concessional debt, to finance exports and growth enhancing strategic investments. The PSI confirms

the prudent macroeconomic stance of the government and focuses on key policy priorities aiming at maintaining a sustainable fiscal position, modernizing the monetary policy to curb inflationary pressures, and preserving external stability.

In 2014 Rwanda's economy appeared to have recovered from the 2013 economic slowdown (linked to suspension of donor aid in 2012). In 2014 the country achieved an annual gross domestic product (GDP) growth rate of 7%. Between 2001 and 2015 real GDP growth averaged at about 8% per annum. The IMF expects annual growth rates for the short term to be 6% in 2016, 6.2% in 2017 and 6.6% in 2018.

1.2.2 Vision 2020 and the importance of the energy sector

Rwanda has made remarkable progress since the 1994 genocide and civil war. Peace and political stability have been re-established, reconciliation efforts are continuing, and democratic institutions and processes are being strengthened. Poverty and social indicators have also improved.

In its Vision 2020 document, written in 2000, the GoR described what Rwandan society and economy should look like in 2020. The major aspiration is to transform the country into a middle income country. The accomplishment of this ambition would require an annual economic growth rate of at least 7%. In order to bring about the necessary rise in the standard of living of the population, growth would also have to be Pro-Poor, giving all Rwandan's the chance to gain from the new economic opportunities.

Vision 2020 has been converted into action by a series of medium-term strategic plans. The first was the Poverty Reduction Strategy (PRSP) finalized in 2001. This was the Government of Rwanda (GoR)'s first systematic assessment of the actions needed to reduce poverty and generate pro-poor economic growth. It was followed by the Poverty Reduction Strategy Paper (PRSP) which covered 2002-2006, and subsequently by the Economic Development and Poverty Reduction Strategy (EDPRS I) covering the period 2008-2012.

EDPRS I (2008-2012) marked a distinct change in the approach to development. A key conclusion of the PRSP experience was that the social sectors (particularly health and education) had been well addressed through the previous programs, while the real economy i.e. the sectors dealing with the production of goods and services, had not. Priority was therefore given to accelerating growth, creating employment and generating exports. These were to be catalysed through public investment in infrastructure, and through regulatory reform. These strategies were intended to reduce the costs and risks of doing business and to create an attractive environment for private sector investment and activity.

During the last few years, Rwanda's economy has been growing at an annual average rate of 8.3%. In its new Economic Development and Poverty Reduction Strategy (EDPRS II 2012-2017), the GoR was even projecting an average annual growth of 11.5% between¹ 2013 and 2018. According to the GoR's vision, economic growth will be, among other things, driven by the uninterrupted provision of energy at prices that are stable and regionally competitive. (Currently, business (medium voltage) tariffs are around twice the tariff in neighbouring countries). Therefore, access to modern sources of energy (petroleum and electricity) at affordable prices will be essential if the country is to achieve this objective. These energy sources are crucial when it comes to developing the services sector and the industry in Rwanda.

¹ The International Monetary Fund (IMF) also considers the medium-term outlook as favourable, forecasting 7-7.5% annual real GDP growth in the period 2015-2018, driven by increased public and foreign investment.

In conclusion, an improved energy sector will contribute to increased business opportunities and to the “Made in Rwanda” trademark², improving the trade balance by reducing import and increasing export.

On the other hand, the provision of cost effective and appropriate energy solutions to the poor must also contribute to poverty alleviation, particularly in rural areas where energy services are currently scarce or expensive.

1.2.3 The evolution of the Energy sector

Given the GoR’s ambition, no single energy source on its own will be able to meet the energy needs of the country in the coming years. Each energy source has its own unique characteristics and the choice of the most appropriate source of energy depends on its foreseen use. The figure below, taken from the Energy Sector Strategic Plan 2013-2018, illustrates the proportion of energy the GoR expects to obtain from bio-products, petroleum products and electricity for different uses in the future. The red arrows illustrate where significant increases in the use of particular energy sources are expected in order to drive the economic growth or the poverty reduction targeted under the EDPRS II.
















	Transport	Heating and Cooking	Lighting	Modern Domestic and commercial Technologies	Industrial processing
Bio-products	 Small fraction of transport expected to use Biofuels	 Bio-products dominate; transition away from wood to charcoal and Biogas.		 none	 Small use of Bio-products e.g. wood burning for tea processing
Petroleum	 Vast Majority of transport will continue to use petroleum products	 LPG will be used but will remain a luxury for the urban wealthy	 Kerosene may be used but Electricity will dominate	 none	 Petroleum to be used for heavy machinery or where grid connections are unavailable
Electricity	 Electric Vehicles not envisaged in the next 5-years	 Electricity will not make economic sense for heating and cooking	 We expect a significant increase in both on and off-grid electricity for lighting	 Electricity will be the only possible option	 We expect a significant increase in Electricity use for industrial processing

Figure: Illustrative view of portion of energy from different sources in 2017

From the figure above, it is clear that bio-products will remain the most appropriate and cost-effective source of energy for heating and cooking. The 5-year strategy of the GoR for the period 2013-2018 is to encourage cleaner, more efficient and sustainable uses of bio-products by transitioning away from wood to more advanced technologies such as biogas and by making the production and use of charcoal more efficient. The Forest Management and Support to woody Biomass Energy of the Rwandan-Belgium cooperation (FMBE) will contribute to this transition.

As far as petroleum is concerned, it is clear that the demand for this source of energy will continue to rise. The envisaged eradication of the need to burn diesel for electricity production will be more than off-set by the increased need for petroleum products in transportation, particularly aviation, and heavy industry.

Finally, though it currently represents a small portion of Rwanda’s Energy mix, electricity will become very important in the future since it is necessary for modern sectors such as manufacturing and ICT. Therefore, increasing levels of both access and generation capacity is vital if the country is to achieve the levels of economic growth and poverty reduction that are targeted.

² The Made in Rwanda campaign is an initiative to boost domestic production and stimulate local consumption habits. It is through the growth of industries that produce high quality goods for domestic use and export that Rwanda’s import bill will be reduced.[RDB-website]

1.3 EDPRS II and the electricity sub-sector

1.3.1 Objectives and strategies for the electricity sub-sector

In order to make sure that the energy sector effectively contributes to economic growth and poverty alleviation, the GoR has set specific objectives and targets in the EDPRS II for the energy sector:

1. Increase Rwanda's electricity generation capacity to 563 MW, leveraging large-scale private sector investment by 2018;
2. 70% of the Rwandan urban and rural households have access to electricity, by 2018
3. Electricity in Rwanda needs to be provided at a regionally competitive tariff

In the Energy Sector Strategic Plan 2013-2018 (ESSP), these objectives are represented as follows:

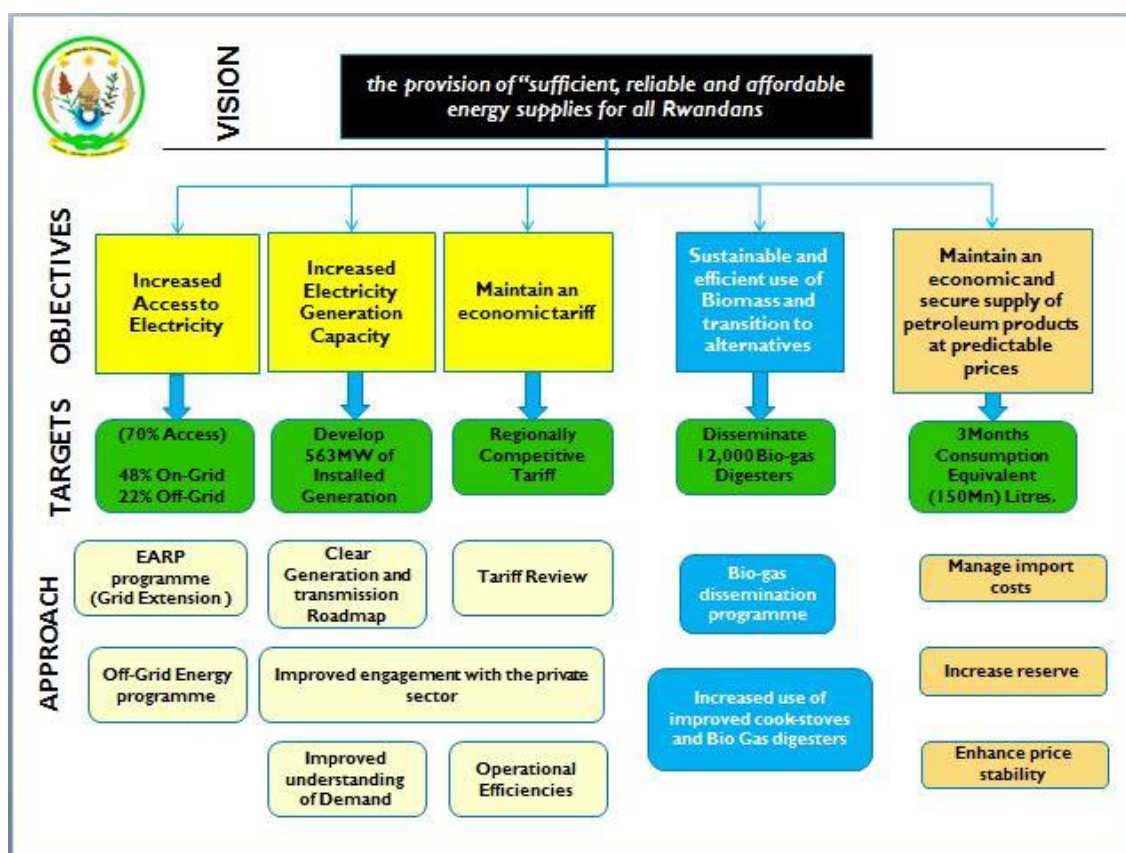


Figure: Summary of Energy sector Vision, Objectives, Targets and strategic approaches

The strategic approaches for all three objectives are discussed in more detail below.

1. Increasing electricity generation capacity

For this objective, the focus is on the exploration and use of alternative and renewable sources of energy such as geothermal energy. The GoR is well aware that the investments needed to increase the production of electricity can not only be provided by the government. Therefore, a lot of effort will have to go into attracting private sector investors through Public Private Partnerships (PPPs). One of the ideas in the Energy Sector Strategic Plan (ESSP) is to create an Energy Development Fund that will finance technical and commercial feasibility studies for specific projects in which a private investment is required. Moreover, the GoR will continue to streamline the process of obtaining licenses and permits for private companies.

The current sub-sector plan aims for power capacity to increase from a current level of 156 MW installed to up to 563 MW of electric power installed capacity by the end of the ESSP period, taking into account an increased reserve margin and imports. This installed capacity would significantly exceed likely demand scenario forecasting 377 MW peak demand at the end of ESSP period (2018).

Other sources use different figures for generation and demand forecasts, but the overall conclusion is that power generation capacity will exceed demand by 2018. (While previously a lack of generation capacity was a threat to grid extension programs, this is no longer the case).

2. Increasing access to electricity

As far as the “Access to Electricity” is concerned, the strategic approach of the GoR, proposed in the Energy Sector Strategic Plan 2013-2018 is twofold:

- On-Grid access (48%): On the one hand, the GoR wants to continue its efforts, under the EARP programme, to connect rural households to the national electricity grid. Priority will be given to productive end-users and households consuming sufficient electricity to make connections financially sustainable.
- Off-grid access (22%): the GoR also emphasises the need for off-grid solutions, especially in remote geographical areas where levels of consumption are too low to justify a grid extension and connections to the national grid. In such cases, the GoR is envisaging to implement market transformation initiatives and PPPs to increase household access to off-grid solutions such as solar PV.

In order to reach these targets, the GoR has developed a Rural Electrification Strategy (RES), approved April 2016, to fine-tune these targets. This strategy can be considered as four distinct programmes:

1. a mechanism to allow households in Ubudehe 1 category to access modern energy services through a basic solar system as a basic necessity
2. a risk mitigation facility to the private sector such that solar products will be made available on financial terms the population can afford
3. Mini-grids will be developed by the private sector with the Government playing a key role in identifying sites and establishing a framework through which these become financially viable investments
4. The government will continue to roll-out the electricity network through the EARP programme, focusing on connecting high consumption users and driving economic growth.

The implementation of the RES will lead to the following access rates (for more info on the multi-tier framework used here, see chapter 2.)

	Revised Target proposal - 2017/18	Original Targets (EDPRS 2 & SSP) 2017/18	2020 targets
Tier 0 (no access)	30%	30%	100% Access
Tier 1	22%	(off-grid): 22%	
Tier 2	48% (of which approx. 31-35% grid)		
Tier 3		(grid): 48%	
Tier 4-5			
Total Access	70%	70%	

The target for EARP has thus been reduced from 48% to 31-35% grid connected households.

Considering the current population of Rwanda of 11.3 million people, in 2.43 million households, the current 600,000 connections cover around 25% of the population, and grid extension is well on its way to reach the targets.

3. Assuring and maintain a regionally competitive tariff

The current electricity tariff is heavily subsidized, with part of REG's revenue coming through government subsidies. The GoR is committed to make power increasingly affordable and phase out indiscriminate subsidies to the electricity tariff by 2017/2018:

- Specific strategic industries and vulnerable population groups will be targeted for “smart” subsidies as matter of policy and to achieve cost transparency.
- The power generation mix will be diversified to gradually reduce petroleum-based power generation.
- The tariff methodology will be revised to disaggregate tariffs based on end-user categories, and to reduce barriers to new customers by removing fixed meter charges.
- Regional imports from East African Power Pool countries at cheaper tariff levels are expected.
- REG is under restructuring to yield operational efficiencies and reduced non-technical losses that contribute to high cost of power.

1.4 Sustainable Energy for All

The Sustainable Energy for All (SE4All) Initiative was launched in 2011 by the UN Secretary General, with three 2030 objectives of

- 1) achieving universal energy access**
- 2) doubling the global rate of improvement in energy efficiency
- 3) doubling the share of renewable energy in the global energy mix.

Implementation of SE4All is country-led. The purpose of the SE4All Action Agenda for Rwanda is to identify country specific goals that are aligned with these global objectives, but taking into account Rwanda's energy and economic resources as well as its development and poverty-reduction priorities.

The Action Agenda estimates the costs of achieving these goals for 2030 and identifies actions that need be taken, acting as a long term strategic roadmap for the country's energy sector.

Rwanda's SE4All Action Agenda has been integrated into the work plan of the country's Sector Working Group, the main coordination and advisory body bringing together stakeholders in the sector including the key ministries, government agencies, development partners, private sector representatives, civil society and NGOs. The Action Agenda reflects inputs from all these groups.

1.4.1 SE4All Actions additional to ESSP

In the longer term compared to ESSP, SE4All Action Plan for Rwanda recommends additional actions in the field of electricity access:

- Identify long-term saturation levels of grid access in Grid roll-out
- Develop an O&M and grid replacement strategy
- Calculate cost-reflective tariffs
- Support new business models for off-grid electrification
- Educate customers
- Consider costs and benefits of fiscal policy options

SE4All Action Agenda also introduces a new **multi-tier access monitoring approach** in line with the Global Tracking Framework. It is further defined in chapter 2. This approach shall provide essential information for the sector to be able to effectively implement the actions here above.

1.5 EARP

Rwanda's Electricity Access Roll-out Program (EARP) is designed to achieve the GoR stated targets set out in EDPRS. These targets call for the total number of electricity connections to increase significantly, with a special emphasis on connecting productive uses, social infrastructures-health facilities, schools and administrative offices. EARP is a nationwide program operating under the Rwanda Energy Group (REG) which has a program management department for this purpose.

1.5.1 History

The first phase of EARP was launched by the GoR in March 2009 to support increase of on-grid electricity access from 6% in 2009 to 16% by 2013. In a joint effort with the electricity Utility, the GoR began planning work identifying the most sensible way forward for electricity to be extended over the next 20 years – with a particular focus on the next five years. This planning exercise was set to connect 16% of all households and at least 50% of identified public institutions by 2013 with the contribution of several donors (WB, NL, BADEA, OFID, Saudi Fund, JICA) and of the GoR.

By the end of 2013, EARP had raised the total number of on-grid electricity connections in the nation from around 110,000 in 2008 to 384,676 by the end of September 2013, raising the national electrification rate to close to 17%.

The success and momentum built under EARP phase I prompted GoR to raise its targets higher for phase II (2013-2018) in the EDPRS II to 31-35% households connected on national grid. This targets call for the total number of electricity connections to increase from 335,000 at the end of 2012 to 840,000 by 2018, with a special emphasis on connecting productive use of electricity centers. Productive use means water pumping for irrigation, commercial hubs such as rural market centers, clusters of commercial activities i.e.; artisans centers «Udukiro», agro processing for food security and post-harvest management, as well as productive/value additions such as coffee-washing stations, tea factories, ... End August 2016, the total number of on-grid connections was 597108 , i.e. more than 24% of the population.

EARP is anchored within REG's development subsidiary Energy Development Corporation Limited (EDCL).

1.5.2 Planning

In 2012-2013, the EARP appointed the company SOFRECO to assist the Planning and Design Unit to carry out the planning, design and costing of a capital investment program to achieve the targets. This planning work captures all potential consumers in GIS and estimates the cost of the needed installations. The zones to be electrified have been divided in several lots with the bigger lots grouped for EPC³ contracts and smaller lots to be dedicated for local contractors. The lots are prioritized according to their average connection costs and their interdependence.

EARP will continue to bulk buy equipment, encourage local and regional companies to participate, and use Engineering, Procurement and Construction (EPC) contractors for a large share of delivery responsibilities. The program consists of two categories of electricity connection:

- Direct connections: A significant amount of connections are directly provided to new customers in the distribution area.

³ EPC is an acronym that stands for engineering, procurement and construction. This type of contract is a common form of contracting in the construction industry. It reduces stress and risk for the owner since the whole project is performed under one contractor responsibility.

- Relocation and Fill-ins: Once the network has been extended to an area, a significant number of additional network connection requests are anticipated to come from this category. Given that the network will already exist, the cost of these connections will likely be less than for the direct connections. Achieving this target, however, will depend to a significant degree on the timely availability of all necessary funds to cover the investments, and on the success of urbanisation policies.

This represents a considerable financial challenge that can only be met with massive Government funding and support from development partners. The total cost of required investments is estimated to 690 million USD over the period 2013 - 2018.

So far, planning has been done for grid extension and for high voltage line construction or upgrade. However, a national distribution grid needs to be permanently adapted to increasing demands, especially in rural development contexts where initial demand is very low, but can grow quickly due to increasing household and especially industrial/productive use.

1.5.3 Overview of development partner contributions to EARP

The main donors for grid extension/upgrade projects (including high, medium and low voltage lines and substations) are :

- African Development Bank :
 - o loans and grants for grid extension (EARP)
 - o Interconnection projects (Rusumo Falls +regional transmission)
- World Bank :
 - o Loan for grid extension (EARP)
 - o Kigali Network Strengthening
- JICA, with their improvement of Substations and Distribution (grant)
- EU, with a grid loss reduction project (for Kigali)(grant)

In addition to works, AfDB, World Bank and Belgium are also financing most of the EARP staff within EDCL.

The following table shows how partners are currently contributing to EARP II specifically:

DP's and funders	Amount in million	Date of agreement (tentative)	Effectiveness date (tentative)	Date of closure	Comments
AfDB	38,15 M USD	Jun 2013	May 2014	Aug 2017	16,5 Grant, 21,6M\$ loan
Belgium	17 M EUR + 12 M EUR + 10 M EUR	Feb 2014 Dec 2015 2016	Feb 2014 Dec 2015 2017	Jul 2018 Dec 2019 Dec 2020	Grant
EU	23 M EUR	Dec 2015	Dec 2015	2021	Loss reduction, grant
Gov of Rwanda	73 M USD				Total commitment to date
WB	70 M USD + 60 M USD + 35 M USD + 16 M USD	Feb 2010 Mar 2013 Dec2015	Jun 2010 May 2013 Dec2015	Jun 2017 Jun 2017 Oct 2021	Loan Loss reduction

Figure: EARP contributors

1.5.4 Challenges

The roll-out of the grid has been successful to date in terms of the rapid increase in numbers of households connected. However, some gaps have been identified by recent evaluations and studies⁴. They highlight the challenges that will need to be tackled by the sector in the next phases:

1.5.4.1 Financial sustainability of network investments

The cost per on-grid new connection is relatively high, at roughly 1000 USD but to an extent the socio-economic long-term aspects justify the cost. Extending the grid more widely into rural areas (rural electrification) where consumption levels of individual households are low is creating economic pressures for the utility EUCL. The average annual cost of each connected consumer is around 50 USD (around 45 USD in financing the loan required for the connection and a provision of 5 USD to contribute towards operations and maintenance (O&M), for which full cost estimates are not yet established). Under the current tariff structure, a consumer would need to use approximately 130kWh per month in order to fund the cost of their own connection. Currently around half of consumers are using less than 20KWh per month. Additional data on consumption levels and O&M costs are needed to assess the challenge.

On the other hand, demand has risen in some areas, to such an extent that the existing grid does not have sufficient capacity anymore to serve the existing high demand.

1.5.4.2 Data and analytics

Monitoring and evaluation frameworks can be linked to global efforts and definitions such as those provided by the Global Tracking Framework (GTF) and the multi-tier access framework (MTF) – see below. Local data collection on actual usage of electricity (i.e. going beyond just number of connections) needs to be incorporated into future planning and cost-effectiveness evaluations. Electricity consumption is an important factor in calculating the access rate.

1.5.4.3 Electricity grid operation and maintenance

Upon completion of construction of the network extension, the infrastructure will be handed over to the Utility organization, EUCL, who will be responsible for its long-term operation and maintenance. O&M planning and implementation needs to be improved, shifting from a reactive/corrective to more proactive/predictive maintenance schemes.

1.5.4.4 Affordability of connection and electricity

Currently, customers wishing to be connected pay an amount towards the capital cost of the connection that is dependent on their income. Those well off pay 100%, or 56,000 RWF, while middle income earners pay 50%, and the poor pay a 10% deposit which is paid over 12 months. The remaining cost can be publicly funded through a combination of grants by development partners and government contributions (90%).

EARP is working on grid affordability using EARP1 & EARP2 funds. Especially the Ubudehe 1 (poorest households) needs support to connect to the grid. EDCL is in the process reviewing the connection policy to make a grid connection more affordable.

1.5.4.5 Coordination between the distribution plans and the generation plans

Though difficult due to the different determining factors of the two plans, there is urgent need to harmonize the distribution planning and coordination with the changing generation plans to ensure that

⁴See. Bibliography in annex 7.8

they go hand-in-hand to meet the set targets. An overcapacity on the generation side can provide a buffer, but comes at a high costs, especially under the current “take or pay” contracts that were signed for electricity generation.

1.5.4.6 Coordination between distribution plans and the provision of off-grid solutions

Given the uncertainty over the rate of roll-out of the grid to rural areas, it is hard particularly for private sector companies to plan off-grid investments. The Rural Electrification Strategy (RES) and the ongoing zoning exercise (planned on-grid and off-grid zones) will tackle this challenge.

1.5.4.7 Power quality

In some areas where the grid is already present, power quality issues arise due to a combination of increased demand and old or inadequate infrastructures. For industries, grid reliability and power quality are of utmost importance. Businesses depend on electricity; an outage can affect equipment and processes, and induces costs. These costs can be increased drastically if an energy-intensive industry (e.g. milling, mining) has to revert to a diesel generator during power outages or due to insufficient quantity or quality of power. Also, the absence or presence of a reliable grid is a determining factor for businesses to start activities.

Power quality includes many aspects, all affecting the use of electricity:

- Reliability (one of the direct indicators in the multi-tier framework): frequency and duration of outages. Outages can be caused by grid protections (overload, surge, lightning ...), load shedding (higher demand than available production capacity) or grid failures (defects).
- Voltage levels : voltage drops due to technical losses or high load can cause some electrical equipment to stop working or even break down early.
- Available power, in terms of capacity (current) : circuit breakers, meters, lines not allowing for the power needed by a household/industry create a power quality issue
- Frequency and waveform. Frequency variations often cause protection equipment to “trip” and cut off loads.

Outages cause a lack of revenue for the energy utility, as some energy demands are not met. High technical losses (up to 20%) induce a high cost to the utility, as all energy put into the grid needs to be paid for, but energy that is lost (in cables, connections, transformers ...) cannot be sold.

This last challenge is gaining importance as the grid and the country evolve. Therefore, it will be the focus for this program.

2 STRATEGIC ORIENTATIONS

2.1 Guiding principles

The focus for the present intervention is based on the following guiding principles:

- The commitment to the achievement of the Strategic objectives for the Energy Sector in Rwanda (EDPRS II)
- The coherence within the Belgian-Rwandan portfolio
- The need to assure a tangible impact for the intervention by avoiding the scattering of available resources.
- The need to complement existing and planned interventions and initiatives in the Energy Sector
- The wish to implement pertinent activities with a high value for money and an economic return on investment.

These principles lead to focus this intervention on the following orientations:

- i. To **upgrade existing networks** where needed, in order to improve the service to the household and business customers in terms of quality and quantity, and to reduce technical losses (and associated costs for the utility) and serve an increasing demand (with associated increased revenue for the utility).
- ii. To **build capacity at EDCL** in order to plan, contract and manage grid interventions, whether it be a grid extension or a grid upgrade.

The scope of BE3EARP (focus on grid upgrading) has changed compared to the earlier BE1&2 EARP (focus on grid extension). The arguments for this change of scope are :

- There is a need to improve service delivery by the existing grid to businesses and households. Businesses need reliable and affordable grid electricity for their operation. Most of them are connected to the existing grid, but some experience problems with power quality. Improving the grid reliability will generate new investments by the private sector that would not be done otherwise.
- Grid upgrades contribute to an improved situation for the utility : technical losses are very costly (especially at current electricity purchase prices), and a higher served demand will increase the utility's revenue.
- Grid extension is well on its way to reach the targets set out in the Rural Electrification Strategy. However, grid extension often requires upgrading of the upstream grid, in order to be able to deliver power within quality standards.
- The new Rural Electrification Strategy (RES) will make sure the off-grid rural areas will not be left "in the dark", by providing the best technical and financial solution to households in these areas. This decreases the pressure for grid extension on social grounds.
- Considering the above, upgrading the grid, based on well identified challenges and needs, will have a higher impact on the Rwandan economy : increased local production and employment, improved trade balance, decreased dependency on fossil fuels (back-up generators) for electricity generation, increased domestic resource mobilisation via taxes, etc.

Electricity grid O&M are not directly part of this BE3EARP intervention. Those topics remain central for the sustainability of EARP but other interventions have planned extensive support in the field⁵.

⁵ O&M is a central theme for the BTC CDEU project. The loss reduction program will be supported by EU (€23M) and WB (€16M).

The Global Tracking Framework and multi-tier access

The Global Tracking Framework (GTF) is a new framework for tracking progress toward the goal of SE4All. It provides an initial system for regular global reporting based on indicators that are both technically rigorous and feasible to compute from current global energy databases, and that offer scope for progressive improvement over time.

Although the identification of suitable indicators required for the framework posed significant methodological challenges, those challenges were no more complex than those faced when attempting to measure other aspects of development—such as poverty, human health, or access to clean water and sanitation—where global progress has long been tracked. In all these aspects of development, a sustained effort of building analytical capability and data capacity has been required across most countries.

Measuring energy access with a multi-tier approach

For energy access, the usual definitions and measurements of access to electricity, although convenient, fail to capture several important aspects of the problem. The new definition moves beyond the electricity connection, using more indicators to get closer to underlying electricity usage: measuring energy access with a multi-tier approach.

Several tools as set of indicators and questionnaires are made available by SE4All to track electricity access progress. Multi-tier levels are defined for households, productive use and community services. The following tables provide the example for household electricity access :

			Tier-0	Tier-1	Tier-2	Tier-3	Tier-4	Tier-5
Attributes	1. Peak capacity	Power	No Electricity	V. Low Power Min 1 W	Low Power Min 50 W	Medium Power Min 200 W	High Power Min 2 kW	
		Daily capacity		Min 4 Wh	Min 200 Wh	Min 1.6 KWh	Min 4 KWh	
	2. Duration	Hours per day	< 4 hrs	Min 4 hrs		Min 8 hrs	Min 16 hrs	Min 23 hrs
		Hours per evening	< 2 hrs	Min 2 hrs		Min 2 hrs	Min 4 hrs	Min 4 hrs
	3. Reliability					Max 3 disruptions per day	Max 7 disruptions per week	Max 3 disruptions per week of total duration < 2 hours
	4. Quality					Voltage problems do not prevent the use of desired appliances		
	5. Affordability				Cost of a standard consumption package of 365 kWh per annum is less than 10% of household income			
6. Legality				Bill is paid to the utility / pre-paid card seller / authorized representative				
7. Health and Safety				Absence of past accidents and perception of high risk in the future				

Figure: Multi-tier framework for household electricity supply

	Tier-0	Tier-1	Tier-2	Tier-3	Tier-4	Tier-5
Annual Consumption levels (KWh)	< 7	≥ 7	≥ 100	≥ 365	≥ 1250	≥ 3000
Daily Consumption levels (kWh)	< 0.020	≥ 0.020	≥ 0.274	≥ 1	≥ 3.425	≥ 8.219

Figure: Multi-tier framework for household electricity consumption

Grid upgrading will improve access in terms of peak capacity or duration, grid reliability, quality and health and safety in the zones of intervention and thus contribute to higher levels of access when applying the Multi-Tier Framework. In order to develop a private sector with industries heavily depending on electricity (milling, pumping, transforming, cooling, IT, ...), grid reliability is needed.

In this regard, it should be stressed that the term “access” does not automatically imply “extension” or new connections; improving access to existing users with a proven demand will also improve overall access level in Rwanda.

2.2 Implementation principles

For the project implementation, the current TFF is embedded in following key principles:

- Intervention flexibility to allow the Project Steering Committee (PSC) to adapt the activities and their budget to the priorities at the time of the intervention.
- Proposed activities will be scored against criteria to rank and prioritise, in order to respond to the needs.
- Works will be implemented through EPC contracts (turnkey).
- From planning until operation, the intervention will collaborate with the district authorities and local EUCL branches on all the activities that are performed in their areas.
- The intervention will align as much as possible to the Rwandan vision on Technical Assistance. The profile of the ITA has been defined together with EDCL/EARP, his/her recruitment and be jointly managed by BTC and EDCL/EARP. The evaluation will be done by BTC with consultation of EDCL/EARP.
- Project Human Resources Strategy will be aligned as much as possible to the EDCL/EARP HR and outsourcing strategy.

2.3 Beneficiaries

The target groups of the intervention are **households, enterprises and public institutions** (health facilities, schools and administrative offices) that will benefit from an improved electricity service.

The positive impacts of electricity are numerous and wide-ranging. The benefits of the project for domestic supply and use in small-scale businesses and in access to electric power for schools and public services can be significant.

For businesses, and also – to a lesser extent - for households, grid reliability is a key issue in deciding where to install equipment or industries. Frequent power outages can cause process disruptions, or can generate high extra costs if a back-up generator is needed, especially for energy-intensive processes like milling, drying, transporting, ... Grid upgrade works improve grid reliability, and allow all industries connected to that part of the grid to scale up activities.

Potential beneficiary enterprises affected by and contributing to regional socio-economic transformation will be **industries like saw mills and joineries, grain mills and other agricultural processing businesses** which need a reliable and affordable power source that is not available right now, but also small shops (light, refrigeration, battery charging, ...) or craftsmen (welders, woodworking, ..) who depend on electricity for their productivity.

Finally, **the electricity utility, EUCL**, will benefit from the intervention. Grid upgrading will

- decrease technical losses (and thus costs of generation from own production facilities, IPP contracts or import)
- decrease operation & maintenance costs, as less interventions will be needed on problematic lines and equipment
- increase revenues due a higher (proven) demand being served (as especially those areas will be targeted that already have a proven high demand)
- the image of the utility with the end-users will improve, as the service to the users will improve.

Indirectly, the GoR and the whole country will benefit from an improved electricity service through increasing taxes paid by businesses using the electricity to add value to the local economy.

Significant **social benefit** will come through employment generation and more efficient operation of key services through provision of electricity access to the villages along the transmission and distribution lines served by the project.

In the construction phase there are temporary employment opportunities for local contractors or supply services.

2.4 Partners and synergies

2.4.1 MININFRA

The Ministry of Infrastructure (MININFRA) is the lead Ministry responsible for developing energy policies and strategies, and for monitoring and evaluating projects and program implementation. It is in charge of setting an enabling policy and legal framework for the sector, including a suggested general approach to the optimal use of state subsidies in the sector, budget preparation, resource mobilization (together with MINECOFIN), and political oversight over government programs designed to expand energy access and service provision.

MININFRA chairs the Sector Working Group (SWG) and the Sector Wide Approach (SWAp) Secretariat, to better coordinate activities in the sector between the various stakeholders.

In this context, Technical Working Groups (TWG) have also been established to support and advise the eSWG in the overall implementation of the SWAp: (i) Access, (ii) Generation, (iii) Efficiency and (iv) Biomass.

The eSWAP secretariat

The Energy Sector Wide Approach (eSWAp) secretariat is a designated office located within the MININFRA mandated to ensure cross government and donor coordination in matters related to the energy sector.

The adoption of energy SWAp was driven by the following ambitions:

- To increase aid effectiveness in the energy sector by reducing fragmentation of donor aid flows in the sector.
- To serve as information hub and ease flow of information to and from the energy sector stakeholders.
- To create a forum for information and knowledge exchange.

The staff of the secretariat includes the coordinator, an energy policy and economics specialist, a M&E specialist and an external link and donor coordination officer.

The eSWAP secretariat is currently financed by Belgium (until end 2019). The role of the Secretariat is to assist the chair (MININFRA) and the co-chair (Belgium) of the eSWG to bring stakeholders together to contribute to policy and strategy, facilitate eSWG meetings, help to coordinate development partners (DPs), and to invite eSWG members for dialogue to harmonize needs and address sectorial issues.

2.4.2 Other ministries

2.4.2.1 MINECOFIN

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

2.4.2.2 MINALOC

The Ministry of Local Government (MINALOC) is the lead ministry in promotion of decentralized services delivery. MINALOC helps in promotion of improved rural based energy technologies and other energy initiatives targeting rural areas. Further, MINALOC speeds up the implementation of the National settlement program (“umudugudu” settlement schemes) that is targeted to reduce the cost of electrification per household.

Local governments have the authority and mandate to coordinate the implementation of discrete enabling policies to drive local economic transformation. Districts are responsible for maintaining the District's infrastructure. Specifically, they have direct responsibility for all decentralized service delivery, including those that may be related to energy at the grassroots. This includes national programs to scale up sustainable energy consumption currently being implemented by the electricity utility targeting communities.

2.4.2.3 MINEDUC

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

2.4.2.4 MOH

The Ministry of Health (MOH) is involved in health facilities electrification.

2.4.2.5 MINIRENA

The Ministry of Natural resources (MINIRENA) is responsible for ensuring the sustainability of natural resources exploitation and for developing and managing compliance to the national environment policy and law.

2.4.2.6 MINICOM

The Ministry of Trade and Industry is engaged to facilitate Rwanda's economic transformation through enabling a competitive private sector integrated into regional and global markets, while ensuring a level playing field and the protection of consumers. EARP collaborates with MINICOM regarding the industrial zones electrification.

2.4.3 REG

The Rwanda Energy Group Ltd. (REG) is a state owned entity that has the legal mandate to translate energy sector policies and programs into the implementation of tangible projects to achieve government's vision in the sector and to efficiently operate and maintain the country's power transmission system.

The REG is organized in two subsidiaries:

Energy Utility Corporation Limited (EUCL): The EUCL is in charge of day-to-day operations of power generation, transmission, distribution and sales to final customers. The EUCL takes charge of planning the transmission and distribution grid in areas already reached by electrification and promoting energy efficiency and demand side management programmes. New management contracts strengthen incentives for the company to achieve aims such as cost reductions, technical and non-technical loss reductions, and improving customer satisfaction. EUCL can react quickly to grid issues, using own funding and procedures. (See also EUCL as a beneficiary, par. 2.3).

Energy Development Corporation Limited (EDCL): The EDCL is responsible for developing both generation and transmission projects, exploiting new energy resources, and executing a least cost power development plan. Its core objective is to facilitate the development and exploitation of domestic energy resources and investments. In pursuing this objective, it has autonomy in managing its affairs, but regularly reports to MININFRA on progress towards set targets. EDCL is working with government and development partners' funds, and uses general public procurement procedures to extend *and upgrade* the grid.

Implications for this program

The EARP is implemented under EDCL. This BE3EARP intervention will also be implemented through EDCL (EARP), as it has the capacity and experience to manage the different procurement processes involved in grid works financed by the public sector.

However, EUCL will be closely involved in the program at all levels, as grid upgrades, technical loss reductions, power quality management are considered to be their role. Also, EUCL has the hands-on experience on the existing network, identifies problem areas through their branches throughout the country and through the dispatch centres, and is one of the main beneficiaries of the program. A EUCL liaison officer will represent EUCL in the project management team, in order to exchange information, develop synergies and ensure coherence and complementarity with other EUCL activities.

2.4.4 REMA

Rwanda Environment Management Authority (REMA) is responsible for the protection of the environment. REMA is involved in supervision and monitoring of environmental aspects.

EARP needs to engage REMA in site selection at an early stage during design phase of the projects. REMA will play the leading oversight role of environmental monitoring of the activities of this intervention. The REMA will carry out this role by ensuring that the environmental management plans (EMPs) contained in the cleared design package are implemented as specified therein. REMA will monitor the reports on a quarterly basis. REMA will also make regular site visits to inspect and verify for themselves the nature and extent of the impacts and the success or failure, of the mitigation measures.

2.4.5 RDB

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

2.4.6 RURA

Rwanda Utilities Regulatory Agency (RURA) is a national institution established for the Regulation of Public Utilities (Energy, Telecommunications, Water and Sanitation, and Transport). The scope of its mandate extends to public utilities involved in renewable and non-renewable energy, electricity, industrial gases, pipelines and storage facilities, and conventional gas extraction and distribution. As the regulator, RURA's principal mandate is to ensure consumer protection from uncompetitive practices while ensuring that such utilities operate in an efficient, sustainable, and reliable manner. RURA also has the important role of updating the electric grid code, ensuring quality of service

standards for power, assessing and reviewing energy tariff structures, licensing all power generation, transmission, and distribution companies as well as retail petroleum filling stations and related storage facilities.

2.4.7 RSB

Rwanda Standards Board (RSB) develops national technical regulations including national technology and performance standards. RSB plays an increasingly important role in establishing, publishing, and disseminating national standards for energy technologies such as biogas digesters and solar appliances.

2.4.8 Other development partners, e-SWAP

Many development partners are involved in different activities of electrification through EARP. Since the WB has been the lead donor in the past, most donors have aligned with its strategy. WB, OFID, BADEA, NL, Saudi Fund, JICA and AFD have contributed to the first phase of EARP. The second phase is involving WB, OFID, BADEA, Saudi Fund, NL, AfDB, Belgium, AFD and EU.

The energy SWAP has been created in order to reduce the fragmentation of donor aid flows and to create synergy between all involved parties.

2.4.9 Other BTC interventions

Synergies will be developed with the other Belgian funded interventions.

1. Across sectors :

- shared human resources to reduce costs (administration and finance, procurement experts)
- shared expertise on gender, monitoring and evaluation, ...

2. And within the energy sector :

- The Forest Management and Support to woody Biomass Energy (FMBE) will contribute to a less carbon intensive energy sector, by an improved forest management. All energy programs are working towards the same overall objectives and visions of the GoR.
- The CDEU intervention of the current Belgian-Rwandan ICP is working on the three levels of capacity building (individual & equipment, organizational, and institutional) of the REG's subsidiary holding company: Energy Utility Corporation Limited (EUCL). Through its objectives, the CDEU shall increase the sustainability of the EARP investments by strengthening EUCL in the O&M of the power network. EUCL will be represented in all management levels of the BE3EARP intervention, creating bridges. Also, the (expertise available within the) CD-EU project will be useful to plan grid upgrade interventions, by collecting and interpreting data, providing guidance for grid upgrade needs, identifying priority actions.
- The synergy with existing BE EARP programs (BE1&2 EARP) is evident : BE3EARP will increase the total budget and generate economies of scale on staffing, management, monitoring and evaluation of the program. By working on grid upgrades, a direct link will be established by EDCL and EUCL.

2.5 Location

Grid upgrade interventions will be analysed for the whole country.

The locations and types of the grid upgrade works will be confirmed or adapted by the Steering Committee according to the updated situation and priorities at the start and throughout the intervention.

The PSC shall decide on the area(s) of the intervention based on the following criteria:

- The specific intervention areas and upgrade activities will be proven technically and economically feasible and pertinent by the feasibility analysis at the start of the project (see ToR in Annex 7.4). This analysis takes into account technical losses, served and unserved demand, specific industrial demands, for the present situation and extrapolated up to ten years in the future.
- The choice of the intervention area shall be harmonized with other DP's interventions
- Areas with high environmental and/or social risk shall be avoided: for example, any natural reserve and their defined buffer zones will be avoided

3 INTERVENTION FRAMEWORK

3.1 General objective

The energy sector is able to provide sufficient, reliable and affordable energy for all Rwandans

The general objective is shared with other BTC interventions in the energy sector. It is fully aligned with ESSP long term vision.

3.2 Specific objective

The access to reliable on-grid electricity services for households, businesses and priority public institutions in urban, peri-urban and rural areas is improved.

The specific objective is more ambitious than the original specific objective of BE 1 & 2 EARP:

- **Businesses** are included as beneficiaries since this kind of customer (SME, small industries,...) plays a central role in the socio-economic development of the electrified area. Businesses shall also be the main contributor to demand increase in the short term.
- **Grid reliability** is an explicit objective of the program.
- The action radius of the intervention is extended to **urban areas**. Any intervention on the grid can affect urban, peri-urban as well as rural populations.

As mentioned in the previous chapter, the definition of access is larger than the number of connections, as it includes the use, quality, safety, reliability in its definition.

3.3 Expected results and activities

3.3.1 Result 1 : Electricity supply is improved by grid upgrade activities

3.3.1.1 Activity 1.1: Needs assessment and feasibility analysis

A large number of proposed sites for single to three phase grid upgrade are available at EDCL (see Annex 7.3). However, the need and feasibility for this list of projects was not confirmed, as the list is based on qualitative observations only. Therefore, a needs assessment and feasibility analysis will be done before and during the start-up of the program. Different scenarios will be analysed to come up with the high priority grid upgrade needs. As the objective is to improve the service to the clients in terms of quality and quantity, other upgrade works that could have an important impact need to be considered as well.

Scope

The scope for grid upgrade works contains the following options :

- a. Single to three phase upgrades

Most of the proposed sites in Annex 7.3 were chosen based on the fact that they are currently distributing single phase power and on an increasing electricity demand at these sites. The proposal for these sites is to upgrade to 3-phase power distribution, to increase the line capacity and to allow for industries and SME to use 3-phase power.⁶

⁶ 3-phase power is the most common source for electric motors, single phase power being limited to around 10kW.

Some of the lines proposed for an upgrade from single phase to 3-phase power have been constructed only recently (3 to 5 years ago). Part of these are considered easily upgradable at a low cost (“upgradable”, with the possibility to add conductors without changing the poles, 93 km), while others need a complete reconstruction (=“non-upgradable”, 208 km). Such a solution needs a thorough justification, before replacing recently built infrastructures. According to some experts, the problem is that some of these lines (medium voltage as well as low voltage) are too long, generating too many technical losses and resulting in a bad power quality at the end of the line.

b. Three-phase power use in single-phase networks

This consists of providing a three-phase solution or similar on a single phase network – without upgrading the whole line to three phase (option that is covered by point a.). The promotion of single phase motors (instead of three phase) and the installation of phase converters (converting single to three phase power) will be considered here. While for a large number of three-phase power it’s worth to upgrade single phase to three phase lines, it can be economically more interesting to use these alternative solutions if only a few three phase clients are present on the line.

c. Replacement of distribution transformers

Overloaded transformers prove that the demand has exceeded the initial design demand of a transformer, and it’s time for an upgrade that will serve the demand more reliably or that will serve a higher demand. Also transformers that often fail can be upgraded.

This includes proposition for rotation of distribution transformers (just changing site locations).

d. Upgrade MV lines

Overloaded lines or lines with many defaults can be improved. This includes single to single phase upgrades and/or three phase to three phase upgrades. Lines are typically overloaded due to a growing demand, either caused by increased demand from existing customers (growing per capita energy use) or by an increased number of clients due to grid extension or densification.

e. Upgrade LV lines

As for MV lines, LV lines can be overloaded. One common problem with LV lines is their long length (often up to 5 km, where a generally accepted standard is 1 km), leading to “overstretching”. This increases line impedance beyond reasonable, generating large voltage drops and yielding low end-of-line voltages for the end user, and electric/electronic equipment that stops working smoothly. Voltage problems are an often heard complaint from end users.

f. Protection systems

Protection systems can drastically improve grid reliability, sometimes at relatively low cost. This includes frequency stabilisation mechanisms.

Methodology

The total needs for grid upgrade works are several orders of magnitude larger than the available budget. A proper priority ranking exercise therefore has to be done, based on solid quantitative data. This exercise will be done by the EDCL Planning Department, in collaboration with EUCL, using existing data at EUCL about outages, loads, breakdowns, etc as criteria. The terms of reference for this work are given in Annex 7.4.

The approach proposed is the net present value methodology⁷, whereby projects or investment scenarios are ranked according to the highest value. This allows for comparison of different kinds of projects, but requires relatively good estimates of current and future levels of demand, technical losses, tariffs and economic return (through taxes) of growing businesses. These data are available at EUCL.

At the end of this activity, a list of priority projects for grid upgrade activities will be available. This priority list will be validated by the Steering Committee before implementation.

The grid in Rwanda will continue to grow and will need more upgrades in the future. The exercise will therefore contain a capacity building component, in order to allow EUCL to make similar analyses in the future.

A dynamic database of grid upgrade activities will be established and kept up to date, allowing for available funds from GoR or other DPs to be oriented towards the actual priorities at any time.

Rubavu network

For the Rubavu network upgrade, the request is to upgrade the 30 year old existing urban network from 6.6 kV to 30kV, in order to reduce technical losses, to harmonise with the rest of the country and to serve an increasing demand.

This network located in Rubavu district is among the oldest of the country. It is currently overstretched and overloaded. There is no doubt among experts about the overall pertinence of upgrading the current 6.6 kV network to 30 kV, for reasons of increased demand and safety of the operators and population.

For the Rubavu network upgrade, open questions are :

- Upgrade systematically to 30kV, or to keep a limited number of clients (e.g. hotels) at 6.6 kV level ?
- Upgrade existing transformer cabins, or use pole mounted MV/LV transformers ?
- Use (partly) overhead 30kV lines or underground cables ?
- Integration of the (privatised) hydropower plant in Rubavu into the network ?

The answers to these questions will be based on an economic analysis and technical feasibility. The study will need to take into account the MV clients and their required voltage level (e.g. will the intervention pay for a privately owned transformer that needs upgrading ?).

It is assumed/planned that the main part of the needs assessment and feasibility study will have been done by the joint EDCL/EUCL team before the start of the program. A provisional amount of 50.000€ is reserved for fill-in studies to be done after the project start.

⁷ The net present value (NPV) of a project is the total sum of all benefits generated by a project minus all costs involved, including initial investment as well as O&M costs, discounted to the present value. It is a very common way of evaluating investment projects.

3.3.1.2 Activity 1.2 : Design and supervise grid upgrade works

Once the grid upgrade projects and sites are known, the preliminary design of grid upgrading investments will be performed by EDCL and reviewed by a consultancy firm. This preliminary design includes drafting the tender documents for EPC contracts for the implementation of the works.

The same firm will also supervise the EPC contracts.

The supervision firm will be hired via public tender according to Rwandan procurement law. These contract(s) will be made flexible enough to adapt to a changing scope of works (e.g. adding more sites if budget allows) and timing (e.g. to take into account possible delays in procurement or implementation).

Based on experience in the ongoing BE 1 & 2 EARP, the design and supervision contract amounts up to 10% of the works budget.

3.3.1.3 Activity 1.3 : Grid upgrade works

Grid upgrade works

Grid upgrade works address supply issues in the Rwandan national grid, as well for power quantity (line capacities) as quality (voltage drop reduction, 3-phase power, reliability).

Network upgrading reduces grid impedance and technical losses, and can be considered as a net increase in production capacity, reducing costs for the utility and allowing to serve a higher demand. It can drastically improve service to the electricity users, with a clear economic impact. For instance, an industrial activity that relies heavily on electricity (e.g. milling) will see their energy costs decrease compared to a (back-up) diesel generator, thus reducing cost of the end product and improving the business case.

This activity will be performed by contractors recruited via public tender according to Rwandan public procurement law, as a turnkey project (EPC, Engineer, Procure, Construct). Several sites will be grouped in order to make an attractive package for an EPC-contractor.

Dismantled lines and equipment (transformers, cables, accessories) will be recycled as much as possible.

Rubavu distribution network upgrade

The Rubavu network upgrade is a government priority for reasons expressed above. The upgrade will reduce technical losses, reduce power cuts due to grid capacity shortage (frequent now) and allow to serve an increasing demand.

This upgrade will require special attention to limit the duration of the actual outage that the numerous customers (households and industries) will experience. The new network can be built to a large extent while the old network is still operational.

The control for distribution feeders in Rubavu is currently done at a plant that is leased to an Independent Power Producer (IPP) and that complicates flexibility in utility operation. This aspect can be corrected for during the grid upgrade (see Annex 7.5 for overview of current and upgraded situation).

Also the Rubavu network upgrade will be implemented by an EPC-contract.

Contract management is a critical issue in general, and in particular for EPC-contracts. Therefore, dedicated human resources are planned to manage the contracts under this program (see below).

All EPC contracts will be conceived in a flexible way, to allow for easy adaptation of quantities and works during implementation. The role of the supervisor and of contract management becomes more important in this kind of (non-lump sum) contracts.

3.3.2 Result 2 : EDCL capacity in financial management, planning, supervision and contract management is strengthened

This result contributes to the objectives by providing technical assistance and staffing support to EDCL. More details about positions, financing and anchorage can be found in paragraph 4.2 (Human Resources).

3.3.2.1 Activity 2.1: Technical assistance

One full time international TA is foreseen at EDCL, covering the BE1/2/3 EARP project planning and supervision (ITA Power Networks). Terms of reference and profile for this position are added in Annex 7.6.4.

The ITA is already financed by BE 1 program, and will be financed for 12 more months under this program (extension until the end of BE3EARP).

The TA will follow the construction activities for BE 1,2,3 EARP and will support the planning of the EARP/EDCL grid extension and upgrade works.

In line with the provisions of the Rwanda Aid Policy, the ITA will primarily be concerned with the transfer of capacity to EDCL/EARP by building the skills and capabilities of local staff (counterparts) and by contributing to the development of systems and procedures.

Concrete needs for capacity building by external expertise and training are catered for in BE1 & 2 EARP.

3.3.2.2 Activity 2.2: EDCL Staff support

The support to EDCL staff consists in financing an important number of key positions within EARP and EDCL. The existing staff support under BE 1 & 2 EARP will be extended, and some new key positions are added in order to increase capacity of EDCL in general and EARP in particular.

Paragraph 4.2 details this staff support.

The staff support also contains three high level (international) functions :

- Planning expert
- Finance expert
- Contract management expert

The draft Terms of Reference of these high level staff members are given in annex 7.7. These profiles will be hired as consultants through a competitive tendering process.

All these staff members will be integrated into the EDCL/EARP structure.

3.4 Monitoring and evaluation

The EARP program has already developed an M&E process of systematic collection, analysis and use of data to improve project performance. The program has adopted a common set of result-based indicators that are reflected in the Results Framework for the project. All indicators are in line with EDPRS and sector strategies.

The intervention will use the already existing BE1EARP M&E framework and complete it in line with the Global tracking Framework.

Given the cyclic nature of M&E, the intervention will go through different M&E processes during the intervention. These processes will include a number of key moments for strategic reflection and reporting. Before entering into detail on the indicators for this intervention, the global M&E process is described in the following paragraphs.

3.4.1 Different components of Monitoring

The different monitoring processes are summarized in the figure underneath.

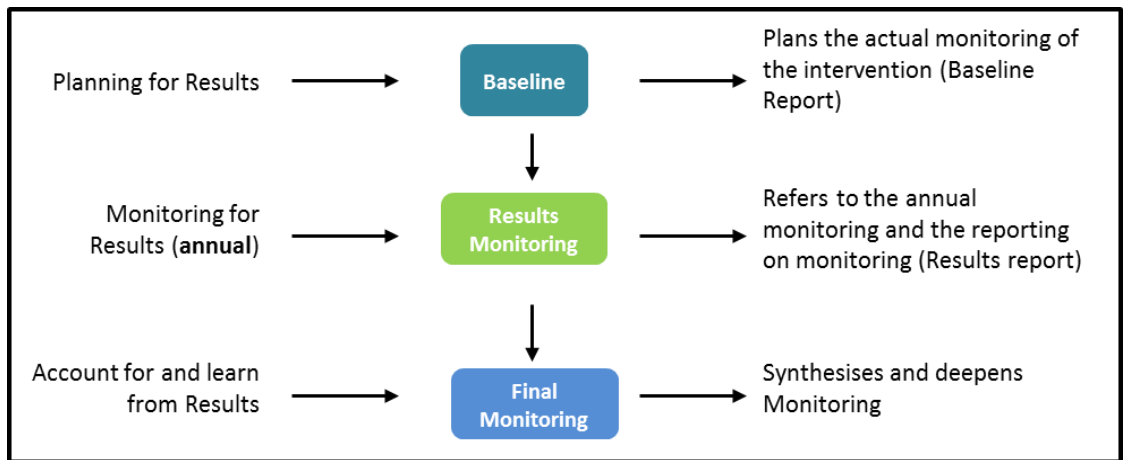


Figure 1 – Monitoring processes

Comprehensive Baseline

The comprehensive Baseline is the first component of the Monitoring process. The comprehensive baseline is about preparing the monitoring of the intervention and is also an opportunity to make sure:

- That stakeholders are on a **same level of understanding** of the change process (the intervention) that is supposed to take place
- That everybody knows how **progress towards this change** (compared to the starting situation) will be measured
- That risks are identified and taken into account in the implementation strategy.

By providing the intervention with a finalized and realistic monitoring framework, the baseline is the link between formulation and implementation. The comprehensive **Baseline report** is the final output of the baseline process which contains:

- *the monitoring matrix*: updated results framework with indicators – including (to the extent possible) the relevant findings of the Capacity Needs Assessment (CNA), the baseline, target and intermediate values, sources of verification, frequency of data collection and responsible for data collection and analysis (i.e. indicators protocols).
- *the risks management plan*: a listing of major risks, their analysis and **the response measures that will be taken**

Results Monitoring

Results Monitoring is the centrepiece of monitoring as it is a recurring, **annual** process that is crucial for **learning, strategic steering and accountability**. It is a participative exercise during which the members of the PMU, together with key stakeholders, analyse how the intervention is doing in terms of results. This team on the basis of information collected through the monitoring of indicators - tries to find answers on questions such as:

- Where are we in terms of results? On track?
- What is working and what isn't? What can we learn?
- Are we still doing things right and doing the right things?
- What are important risks and how should they be managed?
- What should we do differently? What recommendations to make to the steering committee?

- What progress markers/milestones can we see for the next year?
- Etc.

During Results Monitoring, the intervention will analyse the indicators that are intended to monitor the change processes. After a review (based on the questions above), the intervention team will set out a **number of new indicators** (progress markers/milestones/performance indicators) that will allow to **track the change processes in the next 12 months**. Furthermore, based on the strategic reflection mentioned above, some changes to the intervention strategy will be formulated as recommendations for the PSC in the annual Results Report. The PSC has the mandate to approve or reject the propositions of the PMU.

Final monitoring

Final monitoring is the final piece of the Monitoring process through which:

- results achieved at the end of the implementation of an intervention are summarized
- lessons learned are documented after a final reflection on the development process supported by the intervention

In this final monitoring process, the intervention team will do analyses similar to the ones in Results Monitoring, but with a view on the whole of the intervention's implementation process. It will give a final update on results achieved and will focus on what lessons EDCL, the steering committee, MININFRA, BTC and other stakeholders can learn from the intervention. On the basis of this information, a Final Report for the intervention is produced.

3.4.2 Different components of Evaluation

In this context, the term 'review' is used for external evaluations at project level. The main function of a review is to offer an external perspective on the intervention's performance as well as to analyse in-depth the on-going or completed development process. In doing so, reviews are used to:

- analyse if interventions have to be re-oriented in order to achieve the development outcome
- inform strategic decisions
- identify and reflect upon lessons learned

Performed by an independent external actor, reviews play an important role in the **accountability** of the intervention's performance.

Reviews are organized twice during the lifetime of the intervention:

A **Mid-Term Review (MTR)** will be organized after two years of implementation. In the MTR the focus is on **strategic decision making** for the intervention. The Mid Term Review (MTR) of BE3EARP will be combined with the End Term Review (ETR) for BE1EARP.

An **End-of-Term Review (ETR)** will be organized at the end of the intervention. In the ETR, the focus is on **learning**. Therefore, special attention will be given to expected and unexpected change at the level of beneficiaries by using a Most Significant Change (MSC) methodology.

3.4.3 Indicators and means of verification

The indicators for different levels (impact, outcome, output) are presented in the logical framework, Annex 7.1.

For specific technical indicators (power quality indicators), the partner (REG/EDCL/EUCL) will put an M&E system in place. Synergies will be sought with the World Bank RESSP program (Rwanda Electricity Sector Strengthening Project) and with the Integrated Business Management System (IBMS) recently put in place, which will include technical performance indicators of the grid.

3.5 Risk Analysis

3.5.1 Implementation risks

Risks	Risk Level	Alleviation measure
Delays in project implementation, especially during needs assessment and procurement processes	Medium	<p>Start needs assessment during BE1&2 EARP.</p> <p>Clearly follow the procedure for project resources approval process from the procedures manuals</p> <p>Use the project procurement officer for public tenders</p> <p>Dedicated international procurement expertise to speed-up BTC and EUCL processes</p> <p>Contract management support staff</p>
Scope of works unclear, difficulty to rank priorities with risk of delay	Low	Feasibility study based on sound economic analysis of different scenarios (ToR attached) will yield a clear priority list
Conflicts with users due to long power outages during the works	Medium	<p>Reduction of delays to strict minimum by keeping lines operational as long as possible before switching to the new infrastructure (if possible).</p> <p>Proper communication with the users explaining their gains in grid reliability after the works</p> <p>Possibility of providing a temporary diesel generator solution to industrial customers.</p>
Perception risk: Staff working for the Belgian contribution perceived as independent PMU separated from EARP	Low	<p>Project staff under REG payroll management</p> <p>Project staff integrated in EDCL structure</p> <p>Use harmonized salaries for staff</p>

3.5.2 Management risks

Risks	Risk Level	Alleviation measure
High staff turnover within EARP/EDCL	Low	Use harmonized salaries for staff to avoid switching between EDCL/EARP/EUCL for salary gains.
Delays in staff recruitment cause problems in program management	Low	Most support staff already recruited through BE1&2 EARP. Risk is low for the high profiles to be recruited, experience shows these profiles can be found on the job market for an attractive package.

3.5.3 Effectiveness risks

Risks	Risk Level	Alleviation measure
Grid upgrade is not cost-effective (high cost, low benefit)	Low	Feasibility study and ranking according to economic analysis will prioritise the most effective interventions – and even cancel the interventions that have a negative net present value.

3.5.4 Sustainability risks

Risks	Risk Level	Alleviation measure
EUCL economic viability threatened by production costs largely exceeding sales revenues	High	Reducing technical losses (through grid upgrade) will reduce costs for the utility Serving increasing demand (through grid upgrade) will increase revenue for the utility (The actual (implicit) subsidy –selling power at lower price than purchasing and transport cost is out of scope of the program, but can be discussed in the ESWG)
Insufficient knowledge transfer from ITA and high-level consultants to partner institution	Low	ITA and high-level experts ToR include the provision of coaching and mentoring to the EARP technical staff in order to strengthen the local capacity Evaluate ITA internally and by M&E framework
Lack of O&M to sustain the investments	Medium	Increase coordination with the CB component of the Rwandan-Belgian ICP in Energy sector (CD-EU) Keep O&M as a central theme in coordination of eSWG and TWG Grid upgrades rather decrease than increase O&M needs (problematic lines need more attention)
Adverse impact on the environment	Low	Upgrading an existing line has almost no extra impact on the environment. Follow the national standards for environmental and social impact assessment and management plan.
Demand increases rapidly, requiring new upgrades earlier than foreseen	Low	Thorough needs assessment, using extrapolated demand growth figures, taking a margin on cables and transformers design. Transformers to LV can be easily upgraded, LV lines can be split, keeping the existing infrastructure

3.5.5 Fiduciary risks

Risks	Risk Level	Alleviation measure
Use of funds for unintended purpose	Low	<p>Financial controlling measures, internal and external audits are already in place.</p> <p>Project activities are continuously under M&E</p> <p>Steering Committee adds quality assurance</p>
Weak funds recording and accounting	Low	<p>BTC financial management system, procedures and country guidelines</p> <p>Regular accounting controls</p> <p>Co-management modality and presence of dedicated staff in charge of Administration, Finance and Procurement</p>
Low Value-for-money for objectives achievements	Low	<p>Translate recommendations from the lessons learned in appropriate measures on a permanent basis</p> <p>Value for money is implicit in the choice of upgrade projects (economic analysis).</p> <p>Value for money is obtained through competition among EPC contractors and through contract management.</p>

4 RESOURCES

Rwandan and Belgian resources will be available for the project to implement the proposed activities.

4.1 Financial resources

4.1.1 Rwandan contribution

The Rwandan contribution consists in the following elements:

- Secondment of a part-time Director of Intervention and a full-time Project Manager for the whole duration of the intervention (salary and expenses) – estimated to **€ 19.000** over the intervention period
- Full commitment of the entire EARP, EDCL, EUCL staff to the success of the intervention, regardless of the source of funding for the staff (GoR, other donor or project funds) – not quantified
- Possibility to request support from the CBF, SCBI, Training Budget and other Rwandan appropriate instruments and actors as a complement to the intervention – not quantified
- Provision of sufficient office space for the intervention – not quantified. Office premises (with Internet connection, water and electricity services, parking and security) will be provided by the Rwandan partner institutions to the project team in order for them to perform all project activities in close collaboration with EARP. The offices shall be located in the same facilities as EARP.
- Taxes on the supplies, equipment, and works are covered by the Government of Rwanda as agreed upon in the General Development Cooperation convention between both governments – estimated to € 25% on average for Result 1 or **€ 1,937,500**.

The total Rwandan contribution is thus estimated at **€ 2 million**. This estimation is not a ceiling and GoR commits to the responsibility to ensure the above listed contributions, regardless of the exact amount.

Over the complete lifetime of BE3EARP investments, Government of Rwanda will finance the operation and maintenance costs (including HR costs) – estimated to 1% of investment per year over 20 years lifetime i.e. **€ 1,400,000**.

The GoR will also ensure financing of all required structural EDCL/EARP/EUCL staff after the program.

4.1.2 Belgian contribution

The Belgian contribution for the EARP program – component 3 - is **€ 10 million**. The detailed budget per year is presented in the table below. The “modality” mentioned in the table refers to the selected modality for fund disbursement process, see 5.6.3.1

		Management Mode		%	YEAR 1	YEAR 2	YEAR 3	YEAR 4		
The access to reliable on-grid electricity services for households, businesses and priority public institutions in urban, peri-urban and					8.938.000	89%	330.000	1.260.000	4.112.000	3.236.000
A	01	Electricity grid reliability is increased through targeted grid upgrades			7.750.000	78%	150.000	900.000	3.800.000	2.900.000
A	01	01	Needs and feasibility analysis	Co-management	50.000		50.000	0	0	0
A	01	02	Design and supervision of grid upgrade works (10%)	Co-management	700.000		100.000	200.000	200.000	200.000
A	01	03	Grid upgrade works	Co-management	7.000.000		0	700.000	3.600.000	2.700.000
A	02	EARP planning, implementation and supervision capacity is increased			1.188.000	12%	180.000	360.000	312.000	336.000
A	02	01	International technical assistance	BTC management	180.000		0	0	0	180.000
			ITA Power Networks		180000		0	0	0	180.000
A	02	02	EDCL/EARP technical team	Co-management	1.008.000		180.000	360.000	312.000	156.000
			International Planning Expert (consultant)		240000		60.000	120.000	60.000	0
			International Contract Management Expert (consultant)		240000		60.000	120.000	60.000	0
			International Finance Expert (consultant)		240000		60.000	120.000	60.000	0
			Project Engineer (Construction Site)		24000		0	0	0	24.000
			General Services Director EARP		84000		0	0	42.000	42.000
			Contract and Construction Director EARP		84000		0	0	42.000	42.000
			Contract Management Specialist		48000		0	0	24.000	24.000
			Communication specialist EARP		48000		0	0	24.000	24.000
X	Contingencies				176.440	2%	0	0	0	176.440
X	01	Contingencies			176.440	2%	0	0	0	176.440
X	01	01	Contingencies Co-management	Co-management	90.000		0	0	0	90.000
X	01	02	Contingencies direct management	BTC management	86.440		0	0	0	86.440

Z General Means				885.560	9%	85000	165000	95000	540560
Z	01	<i>Salaries</i>		<i>700.560</i>	<i>7%</i>	<i>75.000</i>	<i>165.000</i>	<i>75.000</i>	<i>385.560</i>
Z	01	01	Shared resources	BTC management	270.000	45.000	135.000	45.000	45.000
			RAF international		180000	45000	45000	45000	45000
			Procurement officer international		90000	0	90000	0	0
Z	01	02	Project Co-manager	BTC management	180.000	0	0	0	180.000
			ITA Co-Manager		180000	0	0	0	180.000
Z	01	03	BTC EARP Support staff	Co-management	236.160	30.000	30.000	30.000	146.160
			Project Manager BE EARP		36000	0	0	0	36000
			Admin Assistant		8160	0	0	0	8160
			Project Accountant		24000	0	0	0	24000
			Contract Manager BE EARP		120000	30000	30000	30000	30000
			M&E Specialist		24000	0	0	0	24000
			Procurement Specialist		24000	0	0	0	24000
Z	01	04	Drivers	Co-management	14.400	0	0	0	14.400
			Drivers		14400	0	0	0	14400
Z	02	<i>Investments</i>		<i>10.000</i>	<i>0%</i>	<i>10.000</i>	<i>0</i>	<i>0</i>	<i>0</i>
Z	02	01	ICT and office equipment	BTC management	10.000	10.000	0	0	0
			lumpsum equipment		10000	10000			
Z	03	<i>Running Costs</i>		<i>55.000</i>	<i>1%</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>55.000</i>
Z	03	01	Vehicle Operating Costs	BTC management	18.000	0	0	0	18.000
Z	03	02	Communication costs	BTC management	6.000	0	0	0	6.000
Z	03	03	Field Missions	BTC management	6.000	0	0	0	6.000
Z	03	04	External Communication costs	BTC management	10.000	0	0	0	10.000
Z	03	05	Training	BTC management	10.000	0	0	0	10.000
Z	03	06	Financial costs	BTC management	2.500	0	0	0	2.500
Z	03	07	VAT costs	BTC management	0	0	0	0	0
Z	03	08	Financial costs	Co-management	2.500	0	0	0	2.500
Z	03	09	VAT costs	Co-management	0	0	0	0	0
Z	04	<i>Audit, Monitoring and Evaluation</i>		<i>120.000</i>	<i>1%</i>	<i>0</i>	<i>0</i>	<i>20.000</i>	<i>100.000</i>
Z	04	01	Monitoring and evaluation	BTC management	60.000	0	0	0	60.000
Z	04	02	Audits	BTC management	20.000	0	0	0	20.000
Z	04	03	Backstopping	BTC management	40.000	0	0	20.000	20.000
TOTAL				10.000.000		415.000	1.425.000	4.207.000	3.953.000

BTC management	898.940
Co-management	9.101.060

4.2 Human resources

4.2.1 Principles

- Preference for long-term embedded coaching and mentoring rather than “fly in – fly out” TA
- TA should be technically proficient and also have clear capacity building skills (See Rwanda Aid Policy)
- Possibility to share international resources between different interventions within the Energy sector
- EDCL/EARP staff financed by the intervention according to SPIU principles: staff financing is shared among DP’s and GoR

4.2.2 Conditions for local REG HR financing

- HR payroll management will be performed by REG for positions financed by REG/EDCL.
- Differences between salaries financed by different DPs will be avoided: all the salaries will be harmonized and aligned with approved REG salary Framework.

4.2.3 Staff

The list of the **project staff** is indicated in the following table (see also organizational structure in chapter 5), part of this staff is already part of BE1EARP and BE2EARP but shall be available until the end of the BE3EARP intervention, expected to be 12 months later than BE2EARP. The figures in the three columns are additional to each other.

Position	BE1EARP	BE2EARP	BE3EARP	Contract	Financed by / Remarks	
Director of Intervention (DI)	10% x 48 months	10% x 19 months	10% x 12 months	EDCL	Assigned and financed by EDCL/EARP Direct counterpart of the BTC funded project co-Manager,	BE EARP Project Management Unit
Project Manager	1 x 48 months	1 x 19 months	1 x 12 months	EDCL	Funded by the Belgian contribution (for BE3EARP only)Deputy to EARP Director of Intervention for day to day management	
Project Co-Manager	1 x 48 months	1 x 12 months	1 x 12 months	BTC	BTC International Technical Assistant (ITA) Direct counterpart of the EARP Director of Intervention Funded by the Belgian contribution	

Position	BE1EARP	BE2EARP	BE3EARP	Contract	Financed by / Remarks	
General Services director	-	1 x 24 months	1 x 24 months	EDCL	Funded by the Belgian contribution	EDCL Staff Support
Contract Management specialist		1 x 24 months	1 x 24 months	EDCL	Funded by the Belgian contribution	
Contract & Construction Director	-	1 x 24 months	1 x 24 months	EDCL	Funded by the Belgian contribution	
M&E Specialist1	20% x 48 months		20% x 24 months	EDCL	Assigned and financed by EDCL	
Access specialist	-	1 x 48 months	-	EDCL	Funded by BE2EARP Based at EDCL, collaborating closely EUCL	
Communication specialist	-	1 x 24 months	1 x 24 months	EDCL	Funded by the Belgian contribution (24 additional months Be3EARP)	
ITA Power Networks	1x48 months		1 x 12 months	BTC	Funded by the Belgian contribution	BE EARP Support Staff
Project Engineer (Construction site)	1 x 36 months	1 x 24 months	1 x 12 months	EDCL	Funded by the Belgian contribution	
Electrical Engineer (Planning and design)	1 x 12 months	1 x 12 months	1 x 12 months	EDCL	Assigned and financed by EDCL	
Procurement Specialist	1 x 48 months	1 x 12 months	1 x 12 months	EDCL	Funded by the Belgian contribution	
Contract Management Specialist (BeEARP)			1 x 48 months	EDCL	Funded by the Belgian contribution	
Project Accountant	1 x 48 months	1 x 12 months	1 x 12 months	EDCL	Funded by the Belgian contribution	
M&E Specialist 2 (BeEARP)			1 x 12 months	EDCL	Funded by the Belgian contribution	
Administrative Assistant	-	1 x 48 months	1 x 12 months	EDCL	Funded by the Belgian contribution	

Position	BE1EARP	BE2EARP	BE3EARP	Contract	Financed by / Remarks	
Drivers	2 x 48 months	1 x 48 months + 2 x 12 months	3 x 12 months	EDCL	Funded by the Belgian contribution 3 existing drivers financing extended until the end of the project period	
Environmental Safeguard	30% x 48 months	25% x 12 months	25% x 12 months	EDCL	Assigned and financed by EDCL The rest of the workload is dedicated to other interventions under EARP	
Social Safeguard	30% x 48 months	25% x 12 months	25% x 12 months	EDCL	Assigned and financed by EDCL The rest of the workload is dedicated to other interventions under EARP	
International Procurement Expert	X	X	50% x 12 months	BTC	Half time extension until end of BE3 EARP Funded by the Belgian contribution	BTC Shared Resources
RAFI: Responsible for Administration, Finance	1 x 48 months	1 x 12 months	1 x 12 months	BTC	BTC international Technical Assistant (shared ITA) Funded by the Belgian contribution	

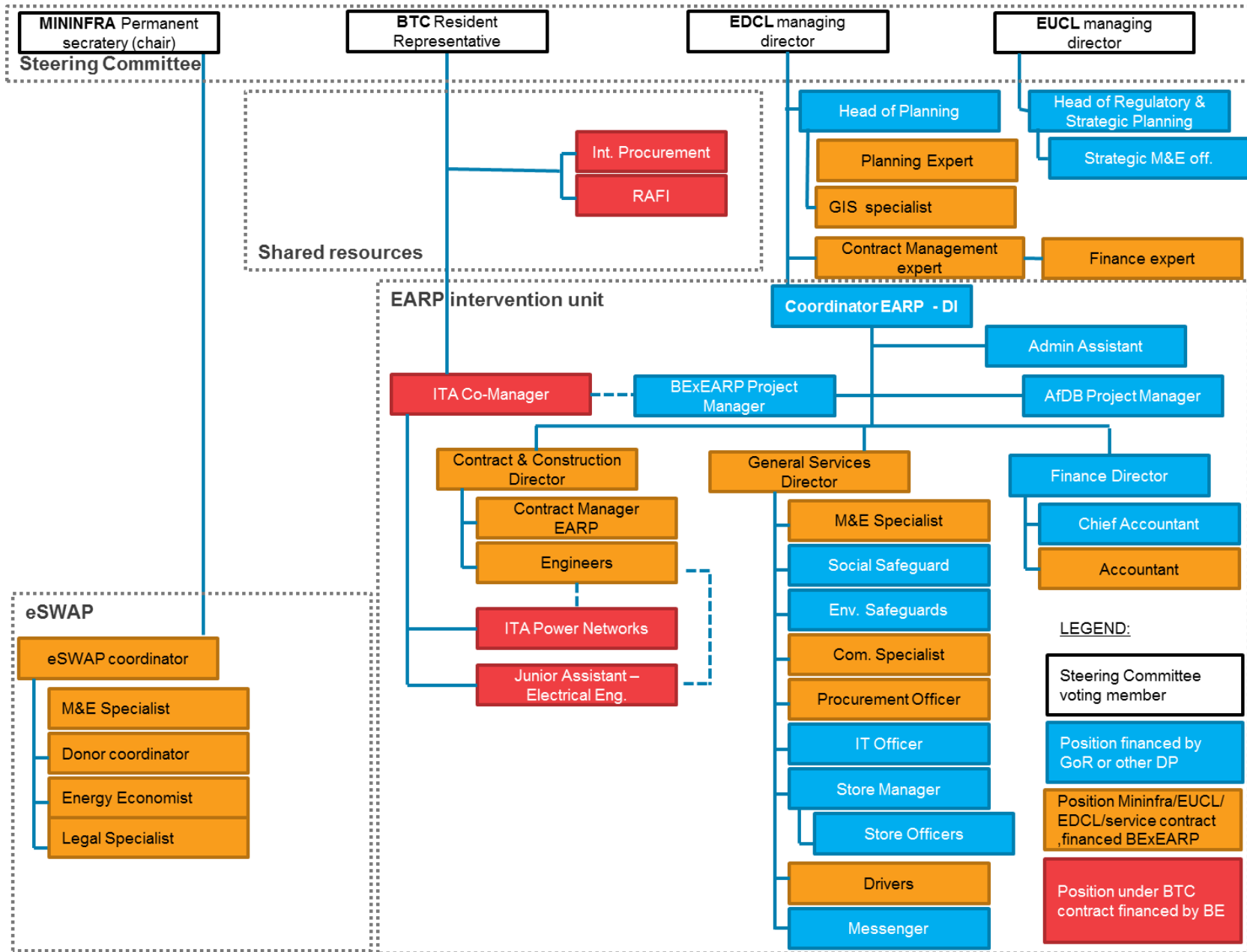
The following **organizational chart** provides the structure including hierarchical lines and key counterparts (dotted lines) to ITAs.

The DI and the EARP Project Manager and other support staff are not funded by the project as they are provided by REG. These positions are crucial for the success of the project.

Additional HR

In addition, junior experts can be integrated in the programme through the Junior Programme of the Belgian cooperation. These experts, in training, do not entail budget implications. Possible profiles for junior experts in this programme would be electrical engineers, communication specialists, (socio-)economists, legal experts, ...

The three high-level experts at EDCL (planning, contract management and finance experts) will be contracted through a competitive tendering process for a service contract. They are considered as staff and will have clear responsibilities within EDCL, but are not listed in the table above which only contains contracted employees.



4.3 Other resources

4.3.1 Services

- Targeted consultancies and Advisory services
- Cars maintenance, including fuel and insurance

4.3.2 Furniture and equipment

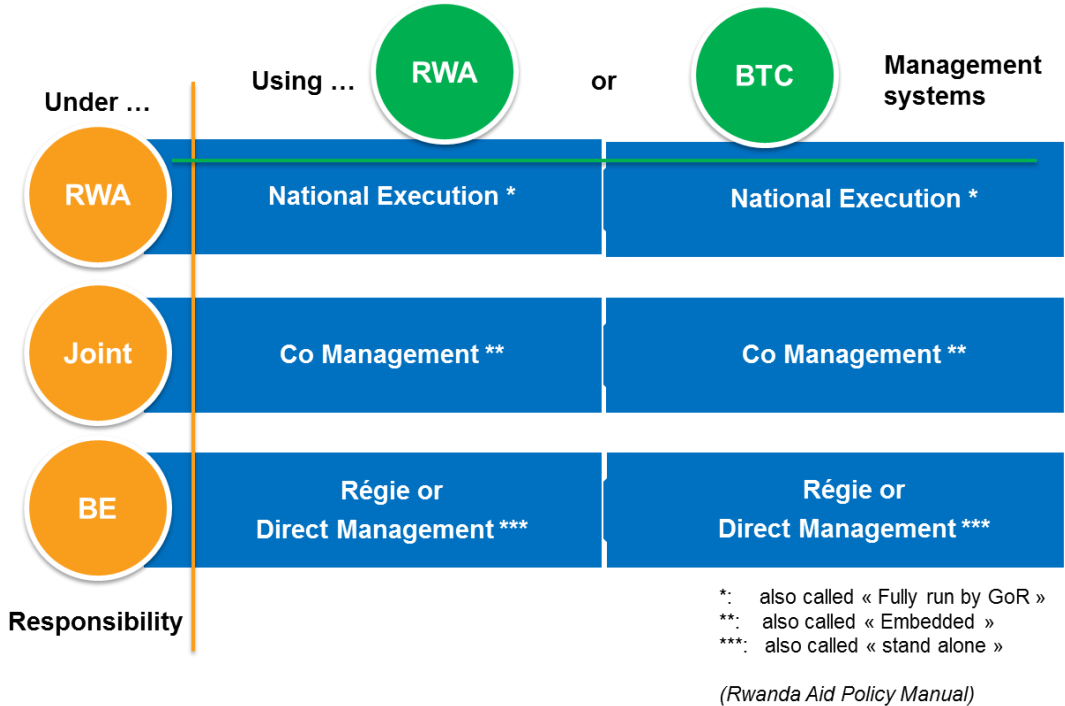
- Limited ICT investments will cover software and consumables.
- Tools and equipment for maintenance premises
- Communication

5 IMPLEMENTATION MODALITIES

5.1 Introduction

This chapter describes how the project will be managed, from start-up until closure, in all its management areas (strategic steering, technical content management (scope), procurement management, financial management, human resources management, quality management and audit) and is intended to enable stakeholders directly involved in the project to:

- Understand which **management system** applies to which project management area. There are two possibilities:
 - Use of the Rwandan system (or of an harmonized donor system recognized by Rwanda as its system),
 - Use of the BTC system.
- Be aware of their **responsibilities** and of those of the other stakeholders in the various project management areas. There are three modes:
 - **Rwandan responsibility:** the Rwandan partner is responsible. For the finance and procurement management areas, the term “national execution” is used.
 - **Joint responsibility:** both the Rwandan partner and BTC are responsible. For the finance and procurement management areas, the term “co-management” is used.
 - **BTC responsibility:** BTC is responsible. For the finance and procurement management areas, the term “régie or BTC management” is used.



These possibilities in terms of system and responsibility mode can be related to the three modus operandi for the project support as introduced in the Rwanda Aid Policy Manual of Procedures:

- A “**Fully run by GoR**” project is a project where the Rwandan system is used under Rwandan responsibility (this situation is called “**national execution**” in Belgian terminology).

- An “**embedded**” project is a project where there is a **joint responsibility**, regardless of the system used (from Rwanda or from BTC).
- A “**stand-alone**” project is a project run under **BTC responsibility**, usually using the BTC system.

The selected responsibility mode for this intervention is “**joint responsibility**” for all management areas. Some specific processes like technical backstopping, audits, MTR, ETR, capitalization services, general means etc. will remain under Belgian responsibility.

No matter the choices made in terms of systems and responsibility modes, partnership, collaboration, transparency and mutual information will apply in managing the project.

5.2 Project duration and lifecycle

The duration of the Specific Agreement (SA) is 5 years (60 months) while the actual implementation phase of the intervention is 4 years (48 months). The implementation phase starts when the SA is signed. All project activities must be terminated at the end of the 48 months implementation period.

The effective start date of the project is the date of signature of the specific agreement.

After the signature of the specific agreement, the project enters its effective **start-up phase**, of about 6 months, during which project human resources will be hired, bank accounts will be opened, first cash call will be made, baseline activities and first year planning will be done, culminating in the production of the start-up project report.

The implementation ends with a **closure phase** of about 6 months to ensure proper technical and administrative closing and hand-over. Project final report is produced after the end of the implementation period.

Consolidation activities are planned at various moments during the project life cycle and during the closure phase.

The figure below gives an overview of the durations of the Belgian contributions to EARP (assuming a start of BE3 EARP in January 2017).



5.3 Project organization and anchorage

5.3.1 Program Steering Committee (PSC)

A joint Program Steering Committee will combine project Steering Committees for BE1EARP, BE2EARP and BE3EARP. It will be combined with overall EARP steering committee to improve coordination & dialogue with other DP's.

5.3.1.1 Role

The PSC is the highest level of decision in the project. It is in charge of the strategic steering of the intervention. The main responsibilities of the PSC are:

Defining the project strategy and ensuring its alignment on the overall EARP strategy (strategic planning, annual planning and budgeting), in relation to EDPRSII Goals

Assessing the development results obtained by the project (strategic quality assurance and control), its sustainability and approve project reports and planning, including the Rwandan contribution to the intervention,

Managing strategic changes like budget line and intermediate results changes, changes on implementation modalities as well as the adaptation of the project organization and anchorage to the new structure of EDCL,

Solving problems that cannot be solved at the operational level in the PMU,

Enhancing harmonization among donors.

5.3.1.2 Composition

For the Belgian contributions, the **members** of the PSC are:

- The EDCL Managing Director, or his delegate, is the chair of the PSC
- The BTC Resident Representative, or his delegate, is the co-chair of the PSC
- The EUCL Managing Director, or his delegate
- A representative of the MININFRA,
- A representative of the MINECOFIN,

The members of the Project Management Unit participate as regular observers and informants. The Project co-manager and the director of intervention act as the secretary of the PSC.

5.3.1.3 Operating rules of the PSC

The PSC meets at least every three months by invitation of the chairperson and at any other time deemed necessary. The invitation must be received by the members at least 7 days before the meeting. The invitation includes an agenda, suggested decisions and supporting documents.

Decisions are taken by consensus. Observers and informants have no voting power.

Decisions of each meeting of the PSC are recorded in minutes signed by the present voting members.

The PSC may invite external experts or stakeholders as resource people for a particular meeting.

The full operating rules will be acted during the first PSC meeting.

5.3.2 Project Management Unit (PMU)

5.3.2.1 Role

The PMU is the operational level in the project. It takes operational decisions and actions on a day to day basis in order that the project strategy is fully implemented, in time and within budget, as approved by the PSC. The main responsibilities of the PMU are to:

Develop and implement the project strategy and operational plans

Prepare quarterly and annual reports for the stakeholders,

Coordinate and provide quality assurance and quality control in the processes of procuring the capacity building services and any other services, goods or works requested by the project (content management), as well as proper monitoring and evaluation of the intervention.

Ensure proper management and apply stringent accountability arrangements for the management of the financial resources allocated to the project,

Ensure that procurement processes and procedures used by the project conform to the applicable procurement guidelines,

Ensure proper human resources management practices conforming to the applicable guidelines,

The responsibilities of the PMU are further developed in the following paragraphs.

5.3.2.2 Composition

The members of the PMU are:

A REG appointed **Director of Intervention (DI)**, acting as a sponsor and as an authorizing officer for the Rwandan side for all scope and technical matters, executed in joint responsibility.

A REG appointed **Project Manager (PM)**, acting as a day-to-day project manager and project focal person. Given the DI regular tasks and responsibilities, it is anticipated that this intervention will need a full time manager accountable for REG, acting as a deputy Director of Intervention.

A REG appoint **Liaison Officer at EUCL**, acting as a relay between the program implemented in EDCL and the management and technical levels at EUCL.

A BTC appointed **Project Co-Manager**, acting as contract manager (for own management procurement procedures) and authorizing officer for the Belgian side for all administrative, procurement and financial matters.

5.3.2.3 Operating rules of the PMU

The PMU meets at least once a month and at any other time deemed necessary. Meetings of the PMU are prepared, organized, follow-up, and chaired by the project co-manager, by default. Other clear arrangements can be decided by the PMU, however.

For matters executed in joint responsibility, decisions are taken by consensus between the DI and the project Co-Manager.

Decisions of each meeting of PMU are recorded in minutes.

5.3.3 Organizational structure and institutional anchorage

The intervention is willing to integrate its management and support functions into EARP/EDCL. All dedicated staff members will be located in the EDCL/EARP premises. Shared resources will have a part time presence in the EDCL/EARP premises.

5.4 Technical content management

Technical content management (or scope management) encompasses the processes that transform the project strategy into activities that must be properly defined, planned, executed and monitored. It also includes the regular result-oriented reporting on project operations as well as possible backstopping by BTC HQ.

5.4.1 Operations definition, implementation and monitoring

System:	Not defined, as these processes are not really formalized
Responsibility:	Joint responsibility

The definition and writing of the technical specifications (ToR) and the technical follow-up (including provisional and final technical acceptance) for all services, goods or works to be procured by the project and the definition, implementation and follow-up of the activities lead by the project team itself, are a joint responsibility of the PM and the co-manager, except if expressly stated otherwise here under.

The PM and the co-manager are supported by the other members of the project team, by other EARP and REG staff and by other institutions, depending on the activity.

5.4.2 Operations coordination

System:	Not defined, as these processes are not formalized
Responsibility:	Joint responsibility

The PMU meets formally at least once a month, in order to review project progress, identify issues and risks and proactively take actions.

Regular joint meetings with BTC 'Institutional Strengthening and Capacity Development of REG – Electricity Utility' are also held to improve synergies.

5.4.3 Technical backstopping

System:	BTC system
Responsibility:	BTC responsibility or joint responsibility

Technical backstopping is the possibility for the project or the PSC to ask the support of experts at the level of BTC HQ.

A backstopping mission can also be decided by BTC representation or BTC HQ.

Backstopping findings and recommendations are presented to the PSC.

5.5 Procurement management

Procurement processes shall be implemented according to the Rwandan Law on Public Procurement and the REG Manual of Procedures. In addition, specific BTC requirements apply, as described in BTC project implementation Guidelines for Rwanda.

5.5.1 Procurement planning

System:	RWA system <u>and</u> BTC system
Responsibility:	Rwandan responsibility for the RWA system Joint responsibility for the BTC system

BTC requires a quarterly procurement plan for all project procurement processes.

Procurement planning is performed by the BTC project Co-Manager and the EARP DI, with the support of the procurement services of EARP including the Procurement officer financed by the project.

The EARP DI and the BTC project Co-manager both approve the quarterly procurement plan in joint responsibility.

5.5.2 Procurement implementation

System:	RWA system by default, BTC system for some clearly defined activities (see below)
Responsibility:	Joint responsibility when the RWA system is used BTC responsibility when the BTC system is used

In addition to the Rwandan system, “no objection” by BTC is required at 3 key moments during the tendering process: before launching, before awarding and before contracting. The contract must be signed by Rwanda with the BTC visum for non-objection.

Table: The authorizing power, depending on thresholds, for launching, awarding and contract signing, is distributed as indicated here under.

RWA	BTC	Threshold (X Equivalent EUR):
“Chief budget officer”	For commitments: Project Co-Manager For payment: RAFI	$X \leq 25,000$
“Chief budget officer”	Resident Representative	$25,000 < X \leq 85,000$
“Chief budget officer”	Resident representative, after review by local independent lawyer appointed by BTC	$85,000 < X \leq 200,000$
“Chief budget officer”	Resident representative, after review by local independent lawyer and by BTC HQ	$X > 200,000$

X is the amount of the tender, VAT included, in EUR or converted from FRW in EUR on the day of publication, using the EUR buying rate of exchange on the National Bank of Rwanda website.

Use of the BTC procurement system:

The tendering processes that will use the BTC procurement system under BTC responsibility are:

- Consulting services for supporting BTC backstopping, if required
- Audit services for project audit on behalf of BTC
- Consulting services for the mid-term review
- Consulting services for the end-term review
- Capitalization services (BTC framework contract)
- Other procurements validated by the PSC

5.5.3 Management of Grant Agreements

In accordance with Article 8 of the BTC Law, BTC can provide financing to one or more third-party partners for the achievement of part of the activities of the TFF or for an action of the third-party partner that contributes to the achievement of the objectives of the intervention. Grants will be awarded in accordance with the modalities described in the *BTC guide for the elaboration and follow-up of Grant Agreements*. Public or private entities that are awarded grants are called "beneficiary parties". The beneficiaries of the actions funded by the grant are called "final beneficiaries".

5.5.3.1 Case where a grant is not identified in the TFF

If the use of a Grant Agreement is not provided for in this TFF but originates with the management of an ongoing intervention, it is necessary to obtain approval of the PSC, which is laid down in a report, on the basis of a clearly reasoned justification why, for this case, the public procurement regulations do not apply. The above modalities concerning notification to the Belgian State on the beneficiary parties of the grants respectively the approval of the beneficiary parties by the Minister of Development Cooperation obviously apply.

5.6 Finance management

All finance management processes must use at least the BTC system, as described in the global and Rwandan BTC guidelines on project implementation (administration and finance), most of them in joint responsibility.

5.6.1 Budget management

5.6.1.1 Budget planning

System:	BTC system <u>and</u> RWA system
Responsibility:	Joint responsibility for the BTC system Rwandan responsibility for the RWA system

The budget attached to the TFF sets out the budgetary limits within which the intervention must be executed. It also indicates expected disbursements per (BTC financial) year.

Budget planning processes have to be implemented both in the BTC system and in the Rwandan system; in order for Rwanda to be able to track project progress in its own financial system and this must be executed under its own responsibility.

5.6.1.2 Budget follow-up and review

System:	BTC system <u>and</u> RWA system
Responsibility:	Joint responsibility for the BTC system Rwandan responsibility for the RWA system

The project expenses cannot exceed the total budget of the intervention and the budget per responsibility mode may not be exceeded.

Any change to the budget must be approved by the PSC on the basis of a proposal that is drawn up by the PMU, according to the BTC rules in this respect.

The use of the budgetary reserve requires a budget change proposal to be validated by the PSC.

Quarterly reports on budget implementation are produced by the RAFi as part of the financial reporting.

5.6.2 Accounting, financial planning and reporting

5.6.2.1 Accounting

System:	BTC system
Responsibility:	Joint responsibility

Accounting is done on a monthly basis according to BTC rules and regulations and its own financial system.

Accounting tasks are performed by the Accounting officer. The EARP DI and the RAFi both approve the monthly accounting in joint responsibility. After approval, the monthly accounting must be transmitted to the BTC representation every month.

5.6.2.2 Financial planning

System:	BTC system
Responsibility:	Joint responsibility

The PMU elaborates quarterly a financial plan, according to BTC rules and regulations and its own financial system, to inform the PSC. Financial planning is based on the quarterly action and procurement plans.

Financial planning tasks are performed by the RAFi, based on the operations planning. The EARP DI and the BTC project co-manager both approve the quarterly financial plan in joint responsibility. This plan must be forwarded to the BTC representation.

5.6.2.3 Financial reporting

System:	BTC system <u>and</u> RWA system
Responsibility:	Joint responsibility for the BTC system Rwandan responsibility for the Rwandan system

Financial reporting processes have to be implemented using the BTC system and could additionally be adapted to the Rwandan system, in order for Rwanda to be able to track project progress in its own financial reporting system.

5.6.3 Cash management

5.6.3.1 Managing intervention accounts and payments

System:	BTC system
Responsibility:	Joint responsibility or BTC responsibility

Supporting documents for all payments must be kept in the project office.

Accounts in joint responsibility:

As soon as the specific agreement has been signed, an account in EUR (main account) and one operational account in Rwandan Franc will be opened at the National Bank of Rwanda (NBR). Payments from these accounts require a double authorization (BTC and RWA), according to the following specifications:

Authorizing officer for RWA:	Authorizing officer for BTC:	Threshold (EUR):	Type of account
DI	RAFi	< 25,000	Operational
Chief budget officer	RAFi Resident Representative <i>following BTC mandates</i>	> 25,000 ⁸	Main

For logistical reasons, other accounts in joint responsibility may be opened with the approval of the “chief budget officer” and the resident representative.

Account in BTC responsibility:

For local expenses under BTC responsibility, a project account in EUR and RWF will be opened at a local bank, with double BTC authorization.

5.6.3.2 Managing cash and transfers

System:	BTC system
Responsibility:	Joint responsibility or BTC responsibility

First transfer on the main account:

Once the signed specific agreement has been notified to BTC, a first cash call can be sent by the PMU to the BTC representation, per responsibility mode. The requested amount must correspond to the needs for the first three months of implementation.

Following transfers on the main account:

The main account is replenished quarterly according to BTC rules and regulations and its own financial system. The project must submit a cash call per responsibility mode to the BTC representation at the beginning of the month preceding the following quarter.

Cash management tasks are performed by the project accountant. The DI and the RAFi both sign the quarterly cash calls in joint responsibility. The first cash call can be signed by the BTC Program Officer if the project co-manager has not been appointed yet.

⁸ According to BTC systems

5.6.4 Assets and inventory management

System:	BTC system for PMU's assets Rwandan system for assets officially transferred
Responsibility:	BTC responsibility for PMU's assets Rwandan responsibility for assets officially transferred

Assets acquired by the PMU for its own use must be registered in an inventory updated on a quarterly basis according to BTC rules and regulations and its own administrative system. Their use is strictly limited to the activities of the project. At the end of the project, PMU's assets can be transferred to a partner institution after decision by the PSC. It must be formalized by an official transfer statement signed by all parties.

According to the project's objectives, the PMU can acquire infrastructure, equipment and goods to support a partner organization. The official transfer of property has to be validated by the PSC and formalized by an official transfer statement signed by all parties.

Transfer of equipment, infrastructure and goods to a partner institution has to follow rules and procedures from Rwanda in terms of inventory management.

5.6.5 Financial closure

5.6.5.1 Financial balance

From six months before the end of the project implementation phase, the PMU must elaborate each month a financial balance forecast according to BTC procedures.

According to the modalities of the Specific Agreement, any unspent funds from the Belgian contribution will be recovered by the Belgian State after the financial closure of the intervention.

5.6.5.2 Expenses beyond the end date of the specific agreement

No commitment can be made in the last six months of validity of the Specific Agreement without prior approval of the PSC and on exclusive condition that activities close before the end of the Specific Agreement. After the end date of the Specific Agreement, no expenditure will be authorised except if it is related to commitments signed before the end of the Specific Agreement and mentioned in the minutes of a PSC. Operational expenditures after the end of the Specific Agreement will not be accepted.

5.7 Human resources management

The following modalities apply:

System:	BTC system for BTC operations employees RWA system for REG employees and BTC support staff
Responsibility:	Rwandan responsibility for REG employees and BTC responsibility for BTC employees, with some aspects of joint responsibility as detailed below.

The following table shows the primary responsibility mode per HR management process, by position:

Positions	EARP Staff	BTC International Staff	BTC EARP Support Staff
HR processes			
ToR (job description and profile)	EDCL	BTC HQ	BTC RWA
Short listing	EDCL	BTC HQ	BTC RWA
Assessment	EDCL	Joint	BTC RWA
Contracting	EDCL	BTC HQ	BTC RWA
Probation and performance appraisal	EDCL	BTC RWA	BTC RWA
Training	EDCL	BTC RWA	BTC RWA
Missions/Leave	EDCL	BTC RWA	BTC RWA
Payroll	EDCL	BTC HQ	BExEARP
Salary scale and staff regulations	EDCL	BTC HQ	BTC RWA
Early termination of contract	EDCL	BTC HQ	BTC RWA

Additional remarks:

All positions are open for men and women. Female candidates will be encouraged to apply.

If the ToR defined in this TFF must be revised before advertisement, the revised ToR need to be approved by the PSC.

New recruitment procedure is not requested for existing EARP staff that is already working under EDCL contract and that is positively evaluated.

The Accountant/Secretary will be trained by BTC as they will use many aspects of the BTC management system, in addition to their duties in the Rwandan management system. No training other than on the use of the BTC systems is foreseen for the project co-manager, except on explicit request from the partner.

Project objectives are included in the performance contracts of both the EARP DI and the EARP project manager.

5.8 Quality management (monitoring and review)

Monitoring and Evaluation (M&E) is to support accountability requirements, continuous learning and strategic steering.

5.8.1 Monitoring

The different processes are briefly explained below. For every Monitoring process, both the co-manager and the DI (with the support of the PMU team) are responsible for the delivery and quality of monitoring.

5.8.1.1 Baseline

System:	Rwandan EARP system & Global Tracking Framework
Responsibility:	Joint responsibility

Establishing the baseline in the beginning of the project is a BTC system requirement. The EARP project M&E framework is used with the support of EARP M&E specialist.

The Baseline Report will be approved in joint responsibility by the DI and the project co-manager. The Baseline Report will be presented to the Project Steering Committee (PSC), within 6 months after the start of the intervention. The PSC takes note of the Baseline Report and validates the way the intervention will be monitored.

5.8.1.2 Operational monitoring (including planning)

System:	BTC system, RWA system if possible
Responsibility:	Joint responsibility

Operational monitoring refers to both planning and follow-up of the intervention's management information (inputs, activities, outputs). It is an internal management process of the intervention team and is done every 3 months.

5.8.1.3 Results Monitoring

System:	EARP system
Responsibility:	Joint responsibility

Results Monitoring refers to an annual participatory reflection process in which intervention team reflects about the achievements, challenges, etc. of the past year, and looks for ways forward in the year(s) to come. The PSC approves or disapproves recommendations made by the intervention team (see chapter 3).

Rwanda EARP result monitoring system is functional but shall be improved on access definition and criterias (cf. 0 and Activities 3.2 to 3.5).

5.8.1.4 Final Monitoring

System:	BTC system
Responsibility:	Joint responsibility

The purpose of final monitoring is to ensure that the key-elements on the intervention's performance and on the development process are transferred to the partner organisation, the donor and BTC and captured

in their “institutional memory”. This enables the closure of the intervention (legal obligation for back-donor of BTC), the hand-over to the partner organisation and the capitalisation of lessons learned. It can be considered as a summary of what different stakeholders might want to know at closure or some years after closure of the intervention.

5.8.2 Evaluation: Mid-Term Review and End-Term Review⁹

System:	BTC system
Responsibility:	BTC responsibility

Reviews are organised twice in a lifetime of an intervention: at mid and end of term. BTC-HQ is responsible for organising the reviews. The ToR of the reviews and their implementation are managed by BTC Brussels, with strong involvement of all stakeholders (see chapter 3). The role of the PSC is to approve or disapprove the recommendations made in the reviews.

5.8.3 Capitalization

System:	BTC system
Responsibility:	Joint responsibility

A specific budget line is introduced to allow for capitalization and communication activities during the lifecycle of the project.

5.9 Audits

5.9.1 Project audits by BTC

System:	BTC system
Responsibility:	BTC responsibility

Audits will be organised by BTC in the first and third year of the project implementation. A qualified external financial auditor selected and contracted by BTC, will execute the audit. BTC will elaborate the Terms of Reference and select the audit firm. The audit will include the following items:

- verification of the existence and the respect of procedures;
- verification if the accounts of the project reflect reality

The auditor’s reports will be presented to the PSC. If necessary, the project team will elaborate an action plan in order to improve the project procedures and to prove that corrective measures have been taken.

Terms of Reference of BTC audits are a BTC responsibility and will be shared with EARP for information.

⁹ In BTC terminology, the term ‘review’ is used for evaluations at project level.

5.9.2 Project Audits by External Control Bodies

System:	BTC system or RWA system
Responsibility:	BTC responsibility or RWA responsibility or Joint responsibility

Each year, BTC accounts are audited by the Belgian government auditors, who have the right to audit any project implemented by BTC. BTC internal audit chief officer is also free to decide to audit any project implemented by BTC.

The Rwandan authorities, either REG or its parent ministry MININFRA or the Office of the Auditor General for State Finances of Rwanda can also decide to audit the project. In this instance, the Director of Intervention is the primary respondent to the auditor's requests.

Project audits reports are mutually shared and presented to the PSC.

In case the project is audited by the Auditor General Office of Rwanda, it will be clear at the beginning of the audit which systems are to be used. It should be avoided to audit the project compliance to the Rwandan system where the TFF clearly states that the BTC system must be used.

Moreover the scope of control will focus on the co-management budget whereas the BTC management budget will remain under full responsibility of BTC and therefore governed by the jurisdiction of its external control bodies (Belgian Government auditors). If necessary, information on amounts spent in "BTC management" can be provided.

5.10 Modification of the TFF

The present TFF may be amended by mutual consent of the parties.

It is essential to install an attitude of expecting and encouraging a practice of regular modifications based on the insights gained during the implementation. The task of the project management unit and the PSC is to assess the quality of the argumentation for the suggested changes and to request further explanation if necessary.

Careful consideration must be given not to change the present TFF in a way that would unnecessarily change the outcome of the intervention as originally agreed between the parties. A formal agreement by the Belgian government is needed for the following changes:

- Modification of the duration of the Specific Agreement (extending the duration is however not possible);
- Modification of the total Belgian financial contribution;
- Modification of the Overall and Specific Objective of the project.

The request of the above modifications has to be approved and motivated by the Steering Committee. The exchange of letters requesting these modifications shall be initiated by the Rwandese party and shall be addressed to the Belgian Embassy. The following changes to the TFF will have to be approved by the Steering Committee:

- The project results and activities and their respective budgets
- The implementation modalities
- Competences, attributions, composition and tasks of the SC
- The indicators at the level of the specific objective and the results
- The mechanism to change the TFF
- The financial modalities to implement the contribution of the Parties.

All other changes to the TFF should be approved by the chairman of the PSC and the BTC resident representative. The adapted version of the TFF shall be communicated to the BTC headquarters and to the Belgian Embassy in Kigali.

6 CROSS CUTTING THEMES

6.1 Environment

6.1.1 Energy Sector level

A Strategic Environmental Assessment (SEA) has been carried out in 2014, which assessed the environmental impacts of the Energy Sector Strategic Plan (ESSP). This identifies impacts in areas such as greenhouse gas emissions, watersheds and wetland ecosystems, forests and protected areas, and biodiversity. Human activities are assessed in agriculture and farming systems, land management practices, exploitation of energy resources, as well as taking account of trends in urbanisation, demography and water and sanitation usage.

The report proposes a number of actions to minimise these impacts which have been incorporated into the SE4All Action Agenda and MININFRA is currently assessing to what extent they can be gradually integrated in the strategy and policy framework of the energy sector.

6.1.2 EARP Intervention level

The intervention is likely to have some positive impact on the environment in Rwanda:

- Environmental negative impact, in noise and air pollution, associated with existing generator usage will be reduced. Improved grid reliability will decrease the use of backup generators by large clients.
- Compared to the original situation – people are using kerosene, candles, or dry-cell batteries to meet their energy demands, households throw used batteries into their pit latrines, into their garbage or directly into nature – an improved electrification is decreasing environmental costs since majority of electricity in Rwanda is produced by renewable sources.
- Providing 3-phase power allows for industrial users to use electrical power where they had to use a 3-phase diesel generator before.
- EARP also promotes energy saving appliances thereby contributing to a higher efficiency in Rwanda's energy sector.
- Reducing technical losses through grid upgrade activities will improve efficiency of use of the produced electricity. Also, part of the electricity is still produced from diesel generators, and soon peat power plants will feed into the grid.

Adverse impacts on the environment are not expected to be severe. The project will not pose major or important risks to biodiversity, natural habitats, and wetlands as it will not fund activities in protected areas, national parks, or wetlands. This is especially true when talking about grid upgrades : these upgrades follow the same distribution lines.

EARP has been rated Category B¹⁰ by the WB Policy on Environmental Assessment (EA - OP4.01), requiring a partial EA. The project involves civil works related to construction of towers and substations, clearing of land and vegetation, use of oil lubricants for the transformers all which will trigger the EA (OP4.01, BP 4.01, GP 4.01) policy.

¹⁰ The World Bank system assigns a project to one of three project categories (A,B,C). For Category B, although an EIA is not always required, some environmental analysis is necessary. Category B projects have impacts that are 'less significant, not as sensitive, numerous, major or diverse. Few, if any, impacts are irreversible, and remedial measures can be more easily designed.' Typical projects include rehabilitation, maintenance, or upgrades, rather than new construction.

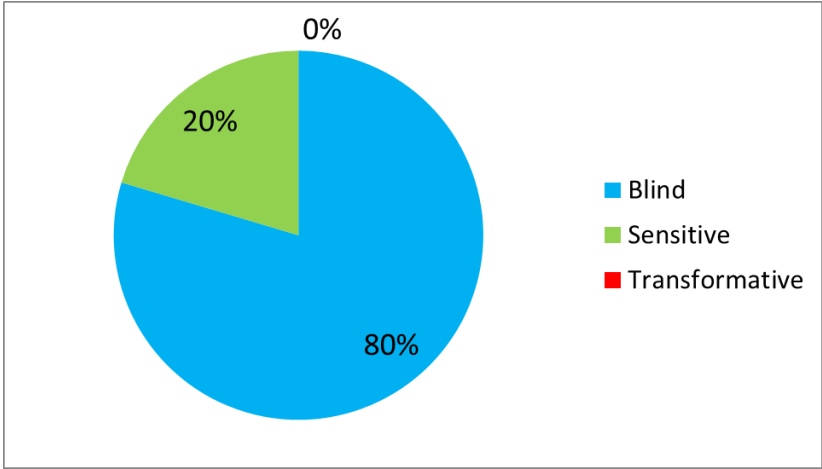
The policies require ESMF which establishes a mechanism to determine and assess potential environmental impacts of EARP. The ESMF sets out screening, mitigation, monitoring and institutional measures to be taken during design, implementation and operation of the activities to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels.

Where lines will be replaced (upgrade from one to three phases, replacement of 6.6 kV by 30 kV), materials dismantled will be recycled as much as possible, either for reuse elsewhere, or for recycling.

6.2 Gender

6.2.1 Gender budget scan

The graph of the gender budget scan below indicates how much of the budget lines related to the activities are gender blind (88%), gender sensitive (12%) or gender transformative (0%).



* There is no gender transformative in this component. An example of a gender transformative activity is A.2.1 in BE2EARP. Through its education campaign around electricity access, the activity addresses gender equality by promoting productive uses of electricity targeting women.

* An example of gender sensitive activity is recruitment, meaning that legislation and procedures of Human Resources management will be respected with regard to gender (equal treatment equal opportunities and where appropriate positive discrimination).

* Activities coded 'blue' are for example construction activities. Investment and equipment activities are also coded 'gender blind'.

6.2.2 Gender and energy link

[adapted from *Energy, Gender and Development What are the Linkages? Where is the Evidence? – Social Development Working Papers, World Bank 2011*].

The literature on gender and energy suggests that providing electricity to communities and homes and motive power for tasks considered women's work can promote gender equality, women's empowerment, and women's and girls' access to education, health care, and employment.

Rural electrification projects often seek to promote gender goals through benefits such as lighting, television, and appliances powered by electricity.

Most gender benefits of providing electricity and motive power occur because women tend to spend more time at home, are responsible for household chores that can be carried out more productively with electricity, and because certain tasks that are culturally defined as women's work can benefit from motive power.

In general, lighting and TV are the first common uses of electricity, accounting for at least 80% of rural electricity consumption. The first and strongest impacts of electricity therefore also occur via lighting and TV. Electricity displaces more expensive candles and kerosene lamps, thereby reducing indoor air pollution and fire and burn risk, and providing higher quality light. Lighting and television help improve access to information, the ability to study, and extend the effective working day. Lighting also improves the productivity of many household activities, and has potential benefits for public safety and expanded income-generating opportunities. Some studies find that electrification increases the evening time women allocate to income generating activities and the probability of (self)employment.

Electrification has been shown to have clear positive impacts on the education of boys and girls, and the evidence is mixed on whether boys or girls benefit the most.

The health benefits of electricity stem from cleaner air, reduced risk of burns, fires, and accidents, better nutrition and food safety from refrigeration, and improved health knowledge from access to mass media.

There is also evidence from a range of studies that electrification reduces fertility rates in rural areas, with positive impacts for women. One probable channel for the impact of electrification on fertility is through television.

Water pumping has a clear positive impact on women. Compared to manual pumps, the time and effort to get water is drastically reduced. Also, water quality sampling ensures the water is potable, reducing water borne diseases compared to surface water or infected well water.

6.3 Digitalisation

Digitalisation aspects for EARP are the following:

- Planning of grid extension and upgrade works, using professional GIS-based tools
- Surveying using digital tools (mobile data collection)
- Measuring technical indicators such as voltage drops, transformer currents, demand curves, by using dataloggers.
- "Data mining" (big data) on the EUCL users database to better understand household and business consumption profiles. These data could be used to filter large customers in the framework of the grid upgrade feasibility study.

Capacity building on these specific tools will be included in the activities.

The grid extension and upgrade activities under BEx EARP will drastically improve and increase access to mobile technologies. A reliable electricity grid allows for phone charging, media access, ICT development etc.

7 ANNEXES

7.1 Logical framework

	Logical of the intervention	Indicators – Tentative target	Baseline Value	Target Value	Sources of verification	Hypotheses
GO	The energy sector is able to provide sufficient, reliable and affordable energy for all Rwandans	Country-wide indicators of the energy sector Per capita monthly power consumption (kWh/inhabitant/month) Aggregated index of Access to Energy (global tracking framework)	(ongoing : MTF framework WB)	31-35% grid access	EDPRS M&E reports EUCL statistics Country statistics, MTF framework	On-Grid electricity is competitive to off-grid solutions.
SO	The access to reliable on-grid electricity services for households, businesses and priority public institutions in urban, peri-urban and rural areas is improved	Technical losses reduction and increase of power delivered Power quality indicators at the selected sites (e.g. voltage, frequency, outages - number and duration, available capacity), depending on the nature of grid upgrade. Number of businesses with access to improved service.	0% reduction	50% reduction	EUCL statistics EDCL/EARP annual performance report EDCL/EARP quarterly monitoring progress report	Grid upgrade activities are properly implemented Grid upgrade activities are ranked and implemented according to proven priorities Generation capacity remains balanced with the electricity demand.
			Unserviced demand	50% reduction of unserved demand		
			e.g. 180V (depending on sites)	230V	EUCL branch reports, EUCL management system Technical surveys	
			Tier x (1/2/3/4/5) (depending on sites)	Tier 5 access (max 7 outages/week)		
R1	Electricity supply is improved by grid upgrade activities	Number and capacity of upgraded installations (Substations, Transformers, Lines) Transformer capacity increased on selected lines Line impedance decreased for upgraded lines	0 km X Z	200 km + 100% Z/2	EARP annual performance report EARP quarterly monitoring progress report	The O&M of the existing and new installations are properly performed by EUCL
R2	EDCL capacity in planning, supervision and contract management for is strengthened	The EARP program will establish its HR baseline and targets for all staff involved (including the ITA and high-level experts)	HR baseline (available within 6 months after start)	Targets reached	EDCL annual & quarterly performance and progress reports Individual performance evaluation and measurement	Staff is recruited Staff is retained

	Activities to reach Result 1	Means	Belgian Contribution	Rwandan contribution
R1	Electricity supply is improved by grid upgrade activities		Costs in Euros	Costs in Euro1,008,000s
A1.1	Needs assessment and feasibility analysis	EDCL staff EUCL Stakeholders Consultants	50,000	
A1.2	Design and Supervise the grid upgrade works	Consultants Technical Assistance	700,000	
A1.3	Upgrade identified installations	EDCL staff EPC contractors	7,000,000	
	Total		7,750,000 €	1,950,000

	Activities to reach Result 2	Means	Belgian Contribution	Rwandan contribution
R2	EDCL capacity in planning, supervision and contract management for is strengthened		Costs in Euros	Costs in Euros
A2.1	Technical Assistance	Technical assistant BTC, EDCL	180,000	
A2.2	EDCL staff support	EDCL – HR department BTC	1,008,000	
	Total		1,188,000	

7.2 Implementation calendar

					CHRONOGRAMME							
					YEAR 1		YEAR 2		YEAR 3		YEAR 4	
A	The access to reliable on-grid electricity services for households, businesses and priority public institutions in urban, peri-urban and rural areas is improved				Q1	Q2	Q3	Q4				
A	01	<i>Electricity grid reliability is increased through targeted grid upgrades</i>										
A	01	01	Needs and feasibility analysis									
A	01	02	Design and supervision of grid upgrade works (10%)									
A	01	03	Grid upgrade works									
A	02	<i>EARP planning, implementation and supervision capacity is increased</i>										
A	02	01	International technical assistance (Capacity Building)									
A	02	02	EARP technical team									

7.3 Grid upgrade proposal

IDENTIFIED CENTRES TO BE SUPPLIED WITH THREE PHASE SYSTEM ON EXISTING SINGLE PHASE NETWORK IN EASTERN PROVINCE

BACKGROUND

The Government of Rwanda is in the middle-way towards achieving the targets set out in the Economic Development and Poverty Reduction Strategy (EDPRS II). In the previous strategy, EDPRS I, the Government implemented projects of electrification of six Districts in Eastern Province where more than Fifty thousand (50,000) new households were connected using single-phase system.

Nowadays, business centres in that area have increased the power demand and have proven unsatisfactory with the current single-phase system configuration, whereby the used equipment and machinery in cottages are not well performing. Due to that, therefore, there is need to upgrade the system from a single-phase to a three-phase configuration whose corresponding electrical equipment and machinery are easily found on the local market. On this, EDCL team was deployed and identified all the lines to be up-graded. It is to note that the load increment in this area averages 7% per annum.

Below are the identified sections of single-phase configuration to be upgraded to three-phase system.

Findings

District Name	Tapping point	Name of the centre	Line length (km)	Comment
Lines with upgradable single phase system				
Rwamagana	Kayonza Center	Along the main road to Rwamagana	5.15	There is a number of growing infrastructure
Kayonza	Kayonza Center	Industry zone & Hotel	5.36	There is a number of growing infrastructure
	Rukara Center	- Kiyovu - Mukigobe - Buhabwa	7.56	There is a number of growing infrastructure

	Akahizi	- Akabahizi - Kahi - Juru	14.48	There is a number of growing infrastructures
	Gitega	- Mwiri - Gasarabwayi	7.68	There is a number of growing infrastructures
Kirehe	Rwaneri	- Rusozi - Kiyanzi - One stop boarder	10.83	There is a number of growing infrastructures
Gatsibo	Rwagitima	- Rwagitima - Rwimbogo - Munini	9.67	There is a health center and other growing infrastructures
Nyagatare	Ryabega	- Ryabega - Ruhuha - Nyakigando - Katabagemu	11.86	There is a number of growing infrastructures
Ngoma	Kazo	- Mutenderi	8.72	There is a number of growing infrastructures
	Rwanteri	- Rusozi - Kiyanzi - One stop Boarder	11.83	There is a number of growing infrastructures
Lines with non-upgradable single phase system				
Rwamagana	Nyamirama	- Munyaga - Karuhaya - Cyanya - Kigabiro	16.5	There is a market under construction and other businesses. There is also a planned pumping station
Kirehe	Cyunuzi	- Industrial Zone - Nganda	8.3	

Gatsibo	Ntatemwa	- Ntatemwa - Gikoma - Nyagasozi - Nyagahanga	36.695	The line serves a lot of schools and health centers. The line is also too long and may create some losses.
Nyagatare	Matimba Center	- Matimba - Nyagatare - Rwintanga	9.129	The centers have a lot of growing infrastructures
	Cyanyirangegene	- Cyanyirangegene	0.367	The center has a number of growing infrastructures
	Nyagatare District	- Cyabayaga - Rukomo - Kiyombe - Karama - Bushara	49.52	The centers have a lot of growing infrastructures and the line is too long and may create a lot of losses
	Nyagatare Hospital / Nshuli	- Rwempasha - Tabagwe	43.9	The centers have a lot of growing infrastructures and the line is too long and may create a lot of losses
Ngoma	Remera	- Muhurire - Gasetsa	5.65	There is a number of growing infrastructures
	Murehe	- Ngara	2	There is a number of growing infrastructures
	Zaza Petit seminaire	- Ngoma - Nyange	8.72	There is a number of growing infrastructures
	Rukoma Parish	- Rukumberi	6.3	There is a number of growing infrastructures.

	Nshili	- Jarama - Rusirare	11.13	There is a number of growing infrastructures.
	Rukira	- Gituku - Kibatsi	10	There is a number of growing infrastructures.

The total length of upgradable line is **93.16km** and the estimated cost related to upgrading works is USD **1,708,884\$** including the cost of supply and installation of transformers.

The total length of the non-upgradable system (only that system with business centres), is **208.11km**. The cost is estimated at USD **6,553,300** including the cost of supply and installation of transformers.

The developing centers which are not connected to the upgradable lines have been also captured during the survey for further consideration.

7.4 Draft Terms of Reference for the needs assessment and feasibility studies at the start of the program

Introduction

The existing grid in Rwanda experiences several problems, linked to capacity, security, stability, ... The BE3EARP program can tackle some of these problems to improve service. As the available budget largely exceeds the overall upgrade needs, priorities will need to be ranked and implemented according to priority.

The main objective is to select the most adapted projects for grid upgrade within the distribution network (MV and LV) with the following targets:

Encourage productive use for increasing consumption and social benefits (employment, etc.).

Decrease grid losses and associated EUCL costs.

Increase electricity quality such as improving voltage, decreasing the number of interruptions, improving security, etc.

It should be noted that **grid extension is not included in the scope.**

Overall methodology

1. A team composed of EUCL/EDCL personnel and BTC experts will be put in place.
2. EUCL provides information on potential projects corresponding to each project type with the necessary justification based on the aforementioned criteria. The considered geographical area is the whole Rwanda. Quantitative data are requested.
3. The team composed of EUCL/EDCL and BTC staff reviews all the potential projects, defines priority projects and suggests a list of projects for the available budget.
4. The list of projects within the available budget is validated in a steering committee.

Types of potential projects

The following list presents the types of projects that will be considered with the associated criteria to be provided for the justification of the projects.

	Type of projects	Criteria to be considered
1	Line Upgrading from single-phase to three-phase (especially for the backbone MV lines) and replacement of the corresponding equipment	<ol style="list-style-type: none"> a. Losses on the line b. Maximal load compared to admissible load c. Voltage level
2	Upgrading/strengthening of MV lines (overloaded or with defaults) that present abnormally level of	<ol style="list-style-type: none"> a. Number of interruptions per week b. Duration of unserved energy over a week
3	Replacement of distribution transformers (overloaded or with defaults)	<ol style="list-style-type: none"> a. Load on the transformer b. Presence of defects on the transformer
4	Three-phase power use in single-phase networks	<ol style="list-style-type: none"> a. Actual need of the consumers for three phase power
5	System frequency response.	<ol style="list-style-type: none"> a. Number of faults due to non-responsive grid / frequency problems
6	Protection systems	<ol style="list-style-type: none"> a. Number of defaults due to ineffective/damaged protection systems

Detailed methodology

A. Data gathering phase for each proposed upgrade project

1. Collect available info

- Field visits to each of the sites (1 day/site)
- Inventory of all 3-phase and/or industrial loads on the line under consideration, including the current demand profile (peak power, total energy, daily variation) and their future plans for scaling up their activity
- Data collection with other stakeholders (MiniCom for private businesses, Minagri for agro-business), identified water pumping needs (for household or irrigation)
- Data collection with EUCL (local branches) on current loads, outages, electricity sales, ... for the specific sites
- Identify new/probable demands (out of a normal demand growth path of around 7% per year) for the coming 3 to 5 years.

2. Measure technical parameters/indicators using dataloggers for each site (for at least 1 month) or using existing data available at EUCL.

- Voltage drops at end of (LV) line
- Number and duration of outages (deducted from datalogs above)
- Total load on the line/transformers (measuring currents)

3. Estimate technical losses per line and unserved demand for each site (in MWh/month)

Based on measurements extrapolation and interviews during the field visits, the unserved demand can be estimated. (Unserved demand is demand that cannot be served by the current grid due to capacity limits, outages, losses, power quality).

Also technical losses can be calculated based on measures of voltage drops and line impedances at different branches along the line.

B. Feasibility analysis phase, ranking

The team composed of EUCL/EDCL and BTC staff will classify the projects following a **cost-benefit analysis** which will include economic aspects but also social aspects. The cost-benefit analysis will consider the criteria for each type described above.

The projects will be compared between them (for ranking) and with the baseline scenario (no intervention, to confirm the feasibility).

A demand increase estimate of 7% per year will be used for a period of 10 years (equivalent to doubling the current load) for future extrapolations. Technical losses, served and unserved demand will be calculated under the grid upgrade scenario, to allow for a full cost-benefit analysis of scenarios.

Logically, the highest priorities are the sites with currently high technical losses (=cost for EUCL) and with the highest unserved demand (=lack of revenue for EUCL and highest economical loss for the households/industries). Both these figures can be calculated based on measured figures and (current)

tariffs.

The sites will be ranked by highest Net Present Value, calculated using all costs (investment, O&M) and benefits (decreased technical losses, increased EUCL revenue, increased tax revenue from growing industries) related to a proposed upgrade. Social criteria will be taken into consideration as well (e.g. number of clients, safety aspects, community buildings, job creation, ...).

C. Capacity building during the exercise (all phases) :

This exercise will include a capacity building component for EDCL/EUCL :

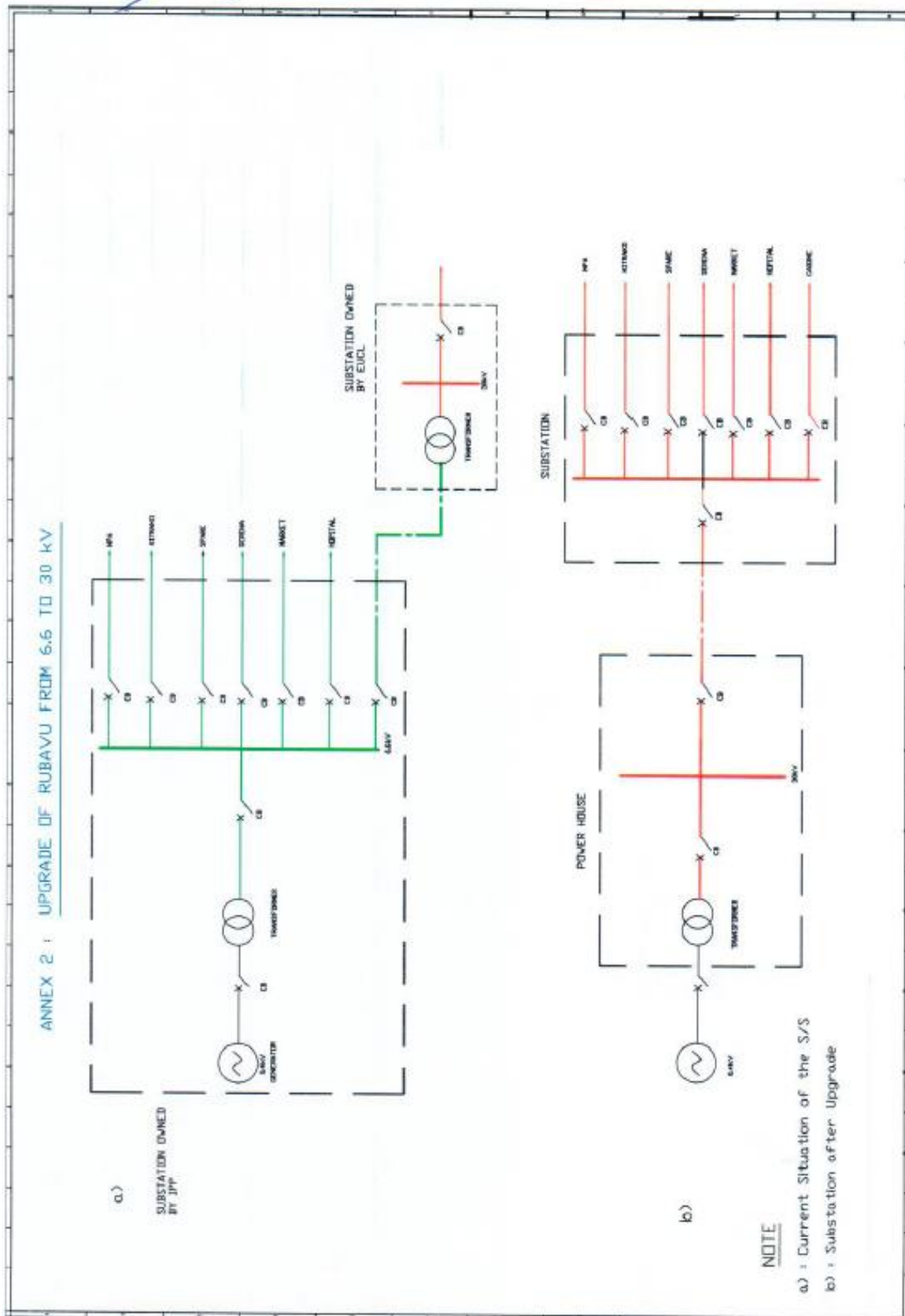
- Learning to work with digitised remote voltage/current dataloggers (if not yet known)
- Learning to prioritise grid upgrade interventions using an internationally applied robust methodology (Net present value, evaluation criteria matrix)

This aspect will be part of the methodological coaching foreseen in this study, and will be supported by the CD-EU intervention.

D. Output : a dynamic database with priorities for grid upgrade

As an output of the exercise, a dynamic database of grid upgrade projects will be available. This database can then be kept up to date by EUCL, so that investments from GoR or other DP's can be quickly oriented towards the priorities on the existing electricity grid.

7.5 Upgrade of Rubavu substation



7.6 ToR long-term personnel

7.6.1 Director of Intervention

The EDCL appointed Director of Intervention (DI) is acting as a sponsor and as an authorizing officer for the Rwandan side for all scope and technical matters, executed in joint responsibility. His responsibilities go beyond the project since he is also the EARP coordinator.

Duty station: Kigali, Rwanda

Duration of the assignment: The DI works part time on the project

7.6.1.1 Main duties and responsibilities

The joint responsibilities of the DI will include (but not necessarily be limited to) the following areas:

- Contracting and supervising the EARP staff, consultants and Contractors
- Ensure that procurement plans are prepared, implemented and updated from time to time as required
- Coordinate the preparation, implementation and revision of work plans and budget of the project
- Ensuring that project activities are related to the agreed performance indicators to measure results
- Ensuring that all contracting, procurement, disbursements and financial management functions at all level of the project are carried out in accordance with established rules and regulations
- Carrying out of periodic checks of financial Records and physical evidence of expenditures
- Ensure complete files for all procurement Records are maintained
- Ensure that project reports are prepared including the Financial, physical progress, social safeguards and environmental, mid-term review reports and any other report that may be required
- Ensure that construction works under the project are executed as planned
- Implement defined strategies to increase electricity connectivity to reach agreed targeted beneficiaries in accordance with PSC priorities
- Ensure that new customers are well registered and automatically transferred in EDCL system
- Ensure that contractors are implementing activities in accordance with international best practices
- Attend and prepare the Project Steering Committee (PSC) meetings on a regular basis

7.6.1.2 Reporting

The DI shall discuss and agree with the PSC on the form and frequency of reporting. Besides periodic progress and financial reports the DI shall provide the following reports:

- Consolidated and coordinated quarterly and annual progress reports, including recommendations;
- Financial reports in accordance with the requirements of BTC and EDCL;
- A Final report summarising the results of the Project including lessons learnt, conclusions and recommendation on how the achievements of the Project can be sustained;
- Any other reports as requested by the Chairperson of the PSC or BTC, Such as procurement plan.

7.6.1.3 Profile

- University degree in Engineering, Finance, Economics, or other related field
- A strong experience of 10 years in program/ or project management, 8 of which he/she shall have managed programs or project in the field of infrastructure
- Proven experience in electrification projects
- Proven experience in project management in international environment (planning, administration, budget management,...)
- Strong managerial and supervisory skills, tact and negotiating skills
- Sound computer skills, including proficiency in Microsoft Office products
- Proven ability to write in a clear and concise manner and effective oral communication skills.
- Strong interpersonal skills, ability to establish and maintain effective working relations with sensitive people and with respect for diversity.
- Fluent in English and in Kinyarwanda

7.6.2 Project manager – Project focal point

The EDCL appointed **Project Manager (PM)** will have primary and overall responsibility for managing the day to day activities of the project. He/She will be the designated point person for managing the operations; including timely monitoring and results reporting.

Duty station: Kigali, Rwanda

Duration of the assignment: 48 months on full time basis

7.6.2.1 Main duties and responsibilities

The joint responsibilities of the PM will include (but not necessarily be limited to) the following areas:

- Manage, organise, coordinate and supervise the implementation of project activities together with the BTC co-management
- Coordinate the project staff in joint responsibility with the BTC project co-manager
- Ensure that procurement plans are prepared, implemented and updated from time to time as required.
- Prepare and review work plans and budget of the project
- Ensuring that project activities are related to the agreed performance indicators to measure results
- Maintaining adequate records of intervention activities.
- Ensuring that all contracting, procurement, disbursements and financial management functions at all level of the project are carried out in accordance with established rules and regulations
- Submission of appropriate justification (financial reports, bank reconciliation statements and other reasonable documentation)
- Ensure complete files for all procurement records are maintained.
- Prepare project reports including the Financial, physical progress, safeguards and environmental, mid-term review reports and any other report that may be required.
- Establish and maintain good working relationships with project participants, counterpart agencies, BTC CB intervention, donors and other relevant organizations and government agencies
- Share information about the project with other organizations and agencies as needed.

- Liaises and co-ordinates project activities with other relevant technical assistance projects
- Attend and prepare the Project Steering Committee (PSC) meetings on a regular basis
- Any other task that may be assigned by the director of intervention

7.6.2.2 Reporting

The PM shall discuss and agree with the DI on the form and frequency of reporting. Besides periodic progress and financial reports the PM shall provide the following reports:

- Consolidated and coordinated quarterly and annual progress reports, including recommendations;
- Financial reports in accordance with the requirements of BTC and EDCL;
- A Final report summarising the results of the Project including lessons learnt, conclusions and recommendation on how the achievements of the Project can be sustained;
- Any other reports as requested by DI, such as procurement plan.

7.6.2.3 Profile

- University degree in Engineering, Finance, Economics, or other related field
- Having at least 8 years of experience in program/ or project management is an advantage, 6 of which he/she shall have managed programs or project in the field of infrastructure
- Proven experience in project management in international environment (planning, administration, budget management,...)
- Experience in rural electrification projects is an added value
- Experience with Government procedures as well as Development Partner Projects is desirable
- Good managerial and supervisory skills, tact and negotiating skills
- Sound computer skills, including proficiency in Microsoft Office products
- Proven ability to write in a clear and concise manner and effective oral communication skills.
- Strong interpersonal skills, ability to establish and maintain effective working relations with sensitive people and with respect for diversity.
- Fluent in English and in Kinyarwanda, knowledge in French is an added value

7.6.3 Project co-manager

A BTC appointed **Project Co-manager**, acting as contract manager and authorizing officer for the Belgian side for all administrative, procurement and financial matters executed in joint responsibility.

Duty station: Kigali, Rwanda

Duration of the assignment: 72 months on full time basis for all three phases of BEARP (See point 4.2.3), 12 months will be financed through BE3EARP

Main duties and responsibilities

The joint responsibilities of the project co-manager will include (but not necessarily be limited to) the following areas:

- Manage, organise, coordinate and supervise the implementation of project activities in accordance with the approved work plans
- Support EARP relevant staff through coaching and mentoring
- Coordinate the project staff in joint responsibility with the EARP project manager
- Ensure that procurement plans are prepared, implemented and updated from time to time as required
- Coordinate the preparation, implementation and revision of work plans and budget of the project
- Ensuring that the baseline is performed at the beginning of the project
- Ensuring that project activities are related to the agreed performance indicators to measure results
- Ensuring that all contracting, procurement, disbursements and financial management functions at all level of the project are carried out in accordance with established rules and regulations
- Carrying out of periodic checks of financial Records and physical evidence of expenditures
- Submission of appropriate justification (financial reports, bank reconciliation statements and other reasonable documentation)
- Ensure that project reports are prepared including the Financial, physical progress, safeguards and environmental, mid-term review reports and any other report that may be required
- Ensure that construction works under the project are executed as planned
- Contribute to the preparation of financial and procurement planning and budgeted work plans
- Establish and maintain good working relationships with project participants, counterpart agencies, BTC CB intervention, donors and other relevant organizations and government agencies
- Share information about the project with other organizations and agencies as needed.
- Liaises and co-ordinates project activities with other relevant technical assistance projects
- Attend and prepare the Project Steering Committee (PSC) meetings on a regular basis

7.6.3.1 Reporting

The Project co-manager shall discuss and agree with the Chairperson of the PSC and the BTC representation on the form and frequency of reporting. Besides periodic progress and financial reports the Project co-manager shall provide the following reports:

- Consolidated and coordinated quarterly and annual progress reports, including recommendations;
- Financial reports in accordance with the requirements of BTC and EWSA;
- A Final report summarising the results of the Project including lessons learnt, conclusions and

recommendation on how the achievements of the Project can be sustained;

- Any other reports as requested by the PSC, the BTC representation or BTC HQ.

7.6.3.2 Profile

- University degree in Engineering, Finance, Economics, or other related field
- Having at least 10 years of experience in program/ or project management (8 of which he/she shall have managed programs or project in the field of infrastructure) is an advantage
- Proven experience in project management in international environment (planning, administration, budget management,...)
- Experience with Government procedures, an experience in Rwanda is an added advantage
- Experience in rural electrification projects is an added value
- Strong managerial and supervisory skills, tact and negotiating skills
- Sound computer skills, including proficiency in Microsoft Office products
- Proven ability to write in a clear and concise manner and effective oral communication skills.
- Strong interpersonal skills, ability to establish and maintain effective working relations with sensitive people and with respect for diversity.
- Sensitivity to socio-environmental issues
- Fluent in English, knowledge in French is an added value

7.6.4 International Technical Assistant Power Networks

BTC appointed ITA.

Location

The ITA (she/he) will be based in Kigali with field trips within Rwanda (generally in the Eastern province).

Duration of the assignment: 60 months on full time basis for all three phases of BEARP (See point 4.2.3), 12 months will be financed through BE3EARP

Job

Provide technical support to the proper planning, design and implementation of the electrification projects funded by Belgium (BE1, BE2 and BE3 EARP).

Assist the EARP unit to plan the extension of the distribution network, taking into account other initiatives under the rural electrification strategy (programme 1 and programme 3 mainly).

Institutional setting

The ITA reports to the BExEARP intervention co-manager.

The expert will be embedded in the EARP unit within EDCL and work closely with EARP engineers. For his contribution to the planning of the extension of the grid, he will work with the head of the planning department and his colleagues.

In line with the provisions of the Rwanda Aid Policy (3.15 – 3.16)¹¹, the ITA will primarily be concerned with the transfer of capacity to EDCL/EARP by building the skills and capabilities of local staff (counterparts) and by contributing to the development of systems and procedures.

Responsibilities

The ITA will have two main responsibilities: technical support of BEx-EARP projects (and possibly projects funded by other donors, if time allows and EDCL wishes so) and planning support to EARP unit.

The ITA will assist the BEx-EARP team to conduct the construction works and other activities with a satisfactory level of quality. He/she will advise the three Belgian-funded projects in rural electrification on all technical aspects such as design, supervision of the works, technical revision of bidding documents and development of technical documents to be used by the partner institution.

He/she will check the quality of the work of the supervision firms.

The ITA will assist and enhance the electrification planning within EDCL/ EARP. Such planning would improve the decision-making process for the investments to be made in the electricity grid, including the on-grid part (distribution, including MV lines) and the off-grid part (home-solar systems and micro-grids). The objective of the ITA is to support EARP to produce optimal planning in order to increase the value of all the investments in the distribution network.

¹¹ Rwanda Aid Policy – As endorsed by the cabinet – Kigali, 26 July 2006:

3.15. The Government of Rwanda receives a large volume of technical assistance (TA), much of it in the form of experts appointed on both short- and long-term contracts. All such assistance should be aimed at the building of local capacity. TA has been criticised for failing to transfer capacity to local staff in an organised manner, often adopting an ad-hoc 'gap-filling' role instead.

3.16. All TA provided to the Government of Rwanda must be concerned primarily with the transfer of capacity to the government by building the skills and capabilities of local staff and/or developing systems and procedures and codifying these in an accessible manner for use by local staff. All terms of reference for TA must recognise these as the ultimate objectives of such assistance.

Tasks

- Advise the BEx-EARP team on all technical matters.
- Assist the BEx-EARP team for the proper planning and implementation of the projects, particularly the construction works.
- Provide technical input into the preparation of terms of reference for the various studies and construction activities subcontracted and support Bex-EARP Project Management Unit to ensure adequate implementation of activities.
- Assist the BEx-EARP team during quality inspection visits to construction sites inspection in coordination with the supervision firms.
- Ensure that contractors are implementing activities in accordance with international standards and best practices for quality, sustainability and security
- Review the technical content of all tenders to be published.
- Suggest propositions for backstopping missions when needed.
- Report issues and statuses over the technical content of all BEx-EARP projects to the intervention manager and co-manager.
- Implement and support the utilization of electrification planning tools such as load flow tools (ex: PSP/E) and develop internal planning tools based on computer software.
- Build the capacity of counterpart EARP staff (through coaching) in planning of the distribution networks.
- Design procedures and tools to gather data amongst various stakeholders.
- Comment and review strategic documents on planning of the distribution network.
- Help to diffuse and communicate the results of the electrification planning to relevant stakeholders.

Profile

Education level:

Electrical or electro-mechanical engineer, preferably with an orientation in power systems.

Proven experience:

- A minimum of 4 years relevant experience in the electricity sector.
- At least 1 year of experience related to rural electrification in Africa and preferably in East Africa.
- Proven Experience with the use of planning tools within the electricity sector.
- A minimum of 1 year of relevant experience in the development cooperation sector.

Skills:

- Strong technical knowledge of the power sector including rural electrification, power system operations and electrification planning (on-grid/mini-grid/solar home systems)
- Good knowledge of optimization tools, IT tools for electrification and power systems (including optimization tools for electrifications, energy balance, power system load flows, etc.).
- Strong analytical skills.
- Good interpersonal skills.
- Capacity to work in a multicultural and multidisciplinary context.
- Excellent command of English, good knowledge of French is an asset.
- Good knowledge of office applications (Word, Excel, Power Point).
- Experience in an Eastern African country is an asset.

7.6.5 International Administration and Finance Manager (RAF)

BTC appointed. The RAF is responsible for a variety of administration and finance-related tasks for all three phases of BEARP (=shared resource). He works under direct supervision of the project management for all co-management related expenses and under BTC supervision for all direct management related expenses.

Duty station: Kigali, Rwanda

Duration of the assignment: 72 months on full time basis for all three phases of BEARP (See point 4.2.3), 12 months will be financed through BE3EARP

7.6.5.1 Main duties and responsibilities

As the person in charge of procurement, financial management and administration, he/she will:

- Control all procurement, financial management and administration issues: solve problems, help improve administration by developing tools, point out and correct errors and problems, report any major problem to the authorizing officers.
- Ensure a correct, smooth and efficient organization of the financial administration;
- Organize regular meetings with financial and administrative staff, and ensure good communication, information and cooperation within the financial administration team.
- Supervise compliance with legal and administrative procedures and guidelines; this implies the he/she studies, checks and reinforces financial guidelines and procedures of the Belgian Technical Co-operation and Ministry of Finance (for direct management) in addition to the Rwandan regulations (for co-management), including the Specific Agreement, the TFF, the BTC quality handbook and any guidelines provided from Brussels or Rwandan legal texts.
- Ensure all instructions received from the representation or BTC headquarters are correctly applied and followed and that the requests are met within the deadline.
- Update guidelines and system of all types of payments in project, esp. allowances.
- Update Administrative and Financial Manual, and ensure communication of new procedures to all admin/fin staff involved.
- Review (and approve) the periodic (monthly/quarterly/bi-annual) accountability returns from implementing partners to ensure that they follow the regulations referred to in the TFF and Project Financial and Operational Manual and meet international accepted standards of public accountability ; and provide comments and advice in improving these systems when required;
- Ensure that the projects narrative and financial reporting guidelines are adhered to including the specified Monitoring and Evaluation processes
- Support the procurement process, contract management and supervision processes

Financial activity reporting

- Final responsibility for timely production of FIT statements; provide guidance and supervision to the accountant who produces the FIT statements.
- Produce financial reports whenever requested following format laid out (e.g. for steering committees), or develops customized formats for ad hoc reports (in excel).
- Make electronic back-up of final versions of financial reports

Budgeting and financial planning

- Follow up and update of budget; Compare budget and planning with actual expenses; provide monthly overview of budget balance to co-management and technical teams
- Financial short-and long term planning: overall, yearly and quarterly (in co-operation with co-management and technical teams); monthly and weekly, in co-operation with accountant.
- Overall management of bank and cash accounts, making cash calls on basis of the financial planning.

Auditing, monitoring, consulting, training

- Audit and analyse project expenses monthly, report any inconsistencies or irregularities.
- Control supporting accounting documents on quality and completeness, and follow up on corrections by the accountant.
- Consult and monitor financial issues related to technical project components (e.g. accountability of beneficiaries and institutions)
- Prepare and provide training on financial management for stakeholders
- Preparing and assisting internal and/or external financial audit missions
- Any other tasks reasonably requested

7.6.5.2 Reporting

The RAF will report to the Project co-manager, the PM and the EARP Finance Director.

7.6.5.3 Profile

- University degree in finance, business administration or business economics;
- At least 5 year experience in financial management, project administration and procurement is an advantage;
- Management experience and experience with an international organization or NGO, 3 years minimum is an advantage;
- Very good hands-on knowledge of excel and word is a must. Other programs (Database, accounting programs) a strong advantage;
- Proficient in English and in French;
- Mature, good communicator and team player;
- Able to work under stressful conditions and not objecting to overtime and field missions.

7.7 High level staff positions financed by the program

The following paragraphs contain the terms of reference for the high level staff members to be recruited through a competitive tender and will be financed by the program (Budget line A_01_02) for EDCL.

7.7.1 Planning expert

Job

Assist EDCL, on a technical level, to successfully plan and implement power system planning activities including EARP, the fourth programme of the Rural Electrification Strategy (RES), in close coordination with other development partners involved.

Location

The expert (she/he) will be based in Kigali with some field trips within Rwanda.

Institutional setting

The position will be located in EDCL, within the Energy Planning Department. The expert will directly assist the Director of Energy Planning and the Head of Projects & Investment Planning.

In line with the provisions of the Rwanda Aid Policy, the expert will primarily be concerned with the transfer of capacity to EDCL by building the skills and capabilities of local staff (counterparts) and by contributing to the development of systems and procedures.

Duration

The expert will begin his contract as soon as possible for a period of 2 years

Responsibilities

The expert will assist and enhance the electrification planning within EDCL. Such planning would improve the decision-making process for the investments to be made in the electricity grid, including the on-grid part (generation, transport and distribution) and the off-grid part (home-solar systems and micro-grids). The objective of the expert is to build the capacity of EDCL to produce optimal planning in order to increase the value of all the investments in the electricity sector.

The expert will work closely with the planning department of EDCL but also with other stakeholders including MININFRA, EARP, other donors, etc. Regularly, he/she will attend and present the electrification planning to all relevant stakeholders.

Tasks

- Implement and support the utilization of electrification planning tools such as load flow tools (ex: PSP/E) and develop internal planning tools based on Excel sheets.
- Build the capacity of planning in the electricity sector.
- Design procedures and tools to gather data amongst various stakeholders.
- Comment and review strategic documents on planning in the electricity sector.
- Diffuse and communicate the results of the electrification planning to relevant stakeholders.

Profile

Education level:

Electrical or electro-mechanical engineer, preferably with an orientation on power systems.

Proven experience:

- A minimum of 4 years relevant experience in the electricity sector.
- At least 1 year of experience related to rural electrification in Africa and preferably, in East Africa.
- Proven Experience with the use of planning tools within the electricity sector.
- A minimum of 1 year of relevant experience in the development cooperation sector.

Skills:

- Strong technical knowledge of the power sector including rural electrification, power system operations and electrification planning (on-grid/micro-grid/home solar systems)
- Good knowledge of optimization tools, IT tools for electrification and power systems (including optimization tools for electrifications, energy balance, power system load flows, etc.).
- Strong analytical skills.
- Good interpersonal skills.
- Capacity to work in a multicultural and multidisciplinary context.
- Excellent command of English and good knowledge of French.
- Good knowledge of office applications (Word, Excel, Power Point).
- Experience in an Eastern African country is an asset.

7.7.2 Financial expert

Overview of assignment

The financial Management consultant will be contracted to undertake a professional review and assessment of EDCL assets and liabilities after the separation exercise; conduct a physical verification and valuation of all assets and liabilities and produce opening balance sheets for each of the company. Upon submission of a final report, new issues emerged during the execution that warranted more work to be undertaken and thus the consultant shall provide “Accountancy and Reporting Support Services for the Energy Development Corporation Limited –EDCL.

Objectives of the Assignment

- a. Under the general supervision of the Managing Director and the direct supervision of the Director of Administration & finance, the financial management consultant is responsible for providing technical support in the various financial management functions, which include the financial Management system review, financial analysis, budget analysis, financial reporting, budgeting, financial planning, voucher control, training and EDCL financial Performance monitoring.
- b. The consultant shall support EDCL to review existing established opening balances for 2014/15, provide technical support in the preparation of financial reports in conformity with the IFRS requirements with all the underlying records to support a smooth Audit Process.
- c. With the implementation of the Integrated Business Management System, all EDCL business processes and functions will be integrated and accessed under one portal. The consultant will work with IBMS consultants to make sure EDCL business operations, Planning, Procurement, HR and Logistics, Consolidated Budget and Finance are integrated to ensure financial reports for different stakeholders are produced through the IBMS.

- d. As part of company growing trend, power generation and transmission operations will be transferred to EDCL from EUCL. The consultant shall provide technical assistance in integrating all new operation changes in company logistics, financial management and reporting. The consultant shall review and update the current EDCL procedure manual to incorporate the changes.
- e. Financial sustainability of EDCL: the consultant shall develop of a Business Plan for EDCL to raise fund to finance recurrent and capital expenditures
- f. The Consultant shall provide technical assistance to EDCL implement the Auditor General's recommendations and put in place appropriate procedures during the preparation of financial statements and the requisite underlying records.

Scope of work

The financial Management consultant shall provide advice and assistance to the Managing Director and Director of Finance and Administration. This may include preparing monthly management accounts and prepare financial planning and budgets, financial and management reporting, including reports for the Board, financial partners and the stakeholders.

The objective of the assignment is to provide EDCL with extended accountancy and financial reporting technical support services to:

- a. Support the finance unit to implement the Auditor General's recommendations arising out of previous audits i.e. 2012/13, 2013/14 and 2014/15
- b. Mentor and coach staff in implementation of workflow processes accounting procedures and practices for effective record keeping and financial reporting in accordance with the International Financial Reporting Standards (IFRS) framework
- c. Work with the staff to implement the new financial regulations and procedures contained in the procedure designed manual
- d. Design new accounting structures and chart of accounts for EDCL and projects, input reviewed 2014/2015 opening balances from the assets and liabilities separation and valuation exercise and support the staff in accurate posting of the balances to the sub-ledgers through an integrated financial management system –IBMS.
- e. The consultant shall set up Financial forecasting, Business planning - constructing plans, Financial due diligence, Treasury management, Financial controls and systems development, Development of business cases and Drafting and agreeing financial rules and regulations that suit EDCL business process and requirements.

Personal specifications

Qualifications:

- Master's Degree in Finance, Accounting, Business Administration or related management field
- Professional accounting/finance qualification like CPA, ACCA , ICAEW or similar
- Any additional post graduate qualification in Business or Management will be an advantage

Experience:

- At least 10 years post qualification in a leadership role, senior management position in a large and complex corporate entity
- 12 years' experience in accounting and financial/revenue management
- Familiar with ICT enabled corporate financial management systems, practices and methods

- Demonstrated experience with internal controls and auditing processes and procedures, cash management, business and financial planning and be abreast with international financial reporting standards;
- Demonstrated understanding of current information and communication technologies, and their application in electric utilities;
- A good understanding of financial models and project finance
- Experience in Energy Development, power generation and transmission companies is a definite advantage
- Experience in Africa or similar emerging economy is an advantage
- Previous experience in staff management, developing staff capability and mentoring potential leaders.

Skills/Competencies:

- Leadership and analytical Skills,
- Strong financial acumen and highly numerate
- Strong interpersonal and negotiation skills,
- Excellent Communication (oral and written) Skills,
- Excellent English language skills both written and spoken;
- Is committed to employee diversity and models ethical behaviour required by staff
- Is able and willing to take decisions after careful but timely analysis.
- Demonstrates a clear track record of achievements relevant to the assignment
- Accomplished Team Builder and Leader.

DELIVERABLES

The deliverables will include:

- a. A Refined Manual of systems, procedures and Work flow processes for the Finance Department
- b. Annual Budgets for the EDCL and the accompanying Quarterly Budgetary Performance Reports
- c. Timely Financial inputs in the Corporate Strategy and Business Planning Process
- d. Annual Financial Reports that provide a true and fair view of the Company's performance and financial position in conformity with IFRS requirements.
- e. EDCL resources are mobilized; revenues are increased from a well-developed financial sustainability plan.
- f. EDCL procedure manual is reviewed to match with business operations and mandate.
- g. All financial operations and reporting are done through an integrated Financial Management systems-IBMS
- h. Auditor general's recommendations are fully implemented
- i. A comprehensive plan for the skills development of the departmental staff and periodic review of progress thereto.

Duration of the assignment

The assignment will be for a two year period.

7.7.3 Contract management expert

Introduction/Background

The Government of Rwanda through the Energy Development Corporation (EDCL) manages multiple and heavy contracts for goods and services in a bid to implement the energy sector development plans. The efforts to ensure strict adherence to contractual obligations on both parties; the contractors and the contracting parties, have more often than not been grossly challenged by lack of clear systems and procedures for effective project and or contract management. As a result, energy sector projects have faced unprecedented cost and time overruns with an ultimate impact on the realization of the set sector goals. On that note, with financing from the Government of Belgium, GoR seeks to recruit an international expert on Contract Management to support the EDCL in proper management of the on-going and future contracts.

Objectives of the assignment

The overriding objective of recruiting an international expert on contract management is to ensure quality of contracts as well as, timely implementation of bidding obligations therein on both parties to the contracts. This will help to reduce cost and time overruns and thus helps in expediting realization of the company goals and objectives.

Scope of work

The assignment for the international expert in contract management shall cover the following scope;

- Develop appropriate systems and tools to facilitate strict scheduling and tracking of the implementation of on-going and future contractual obligations for goods and services and generate alerts for potential delays, as well as suggesting remedial measures as and when required.
- Develop and implement a clear mentorship and skills transfer plan on general project and contract management to EDCL responsible staff during the course of the contract.
- Establish and facilitate implementation of a clear system for effective management of contract enquiries, claims, issues, disputes, variations and risks between contractors and EDCL.
- Advise EDCL's finance department on appropriate methods to align future cash flow plans to pending contractual obligations, ensuring that submitted contractor invoices match available funds. In this, the consultant is further expected to ensure that actual expenditures made on outstanding obligations are well in line with the planned budget, to reduce cost overruns.
- Advice on appropriate strategies to ensure compliance of Independent Power Producers to stipulated project timelines in line with the agreement reached with the government.
- Develop a system for proper documentation of concluded, on-going and future contracts between EDCL and its suppliers for future reference purposes.
- Provide advice and support to EDCL on opportunities to improve procurement outcomes, efficiency and value for money.

Qualifications and experience required

- A master's degree in business administration, law, project management and any other relevant discipline with at least 10 years of practical experience in contract negotiation and management within a similar environment
- Demonstrated experience in a contract management (or equivalent) position at a senior level, especially in Africa or a related environment is a pre-requisite.
- Proven investigative and analytical skills including the ability to use MS Excel, Database and other reporting systems.
- Proficiency in utilizing and interpreting complex financial models is necessary.
- Excellent negotiating and persuasive skills, both in one-on-one and group situations, is an added advantage.
- Excellent command of English and good knowledge of French.
- Proven ability to review, develop and implement procurement guidelines and operating processes.

Reporting arrangements and working relationship

The expert will work with all the EDCL departments but specifically reporting directly to the Managing Director, EDCL, who will serve as his or her immediate supervisor.

Duration of the contract

The expert shall be hired for one year, renewable for a period of one year, if required, and upon satisfactory performance against set and agreed deliverables.

7.8 References

- Vision 2020 (2000)
- EDPRS 2008-2012 (September 2007)
- EDPRS II 2013-2018 (June 2013)
- NEP (March 2015)
- ESSP 2013-2018 (March 2015)
- RES Rural Electrification Strategy (April 2016)
- Electricity Law (June 2011)
- SE4All Country Action Plan (March 2015)
- EARP Project Implementation Manual
- EARP Connection Policy
- EARP Priorisation Rule
- EARP Environmental and Social Management Framework
- EARP Resettlement Policy Framework
- EARP Mid Term Review (July 2012)
- Economist Intelligence Unit Report on Rwanda (May 2012)
- Indicative Cooperation Program (ICP) Belgium – Rwanda 2011- 2014
- Common Performance Assessment Framework (CPAF) (April 2011)
- Proposals for grid upgrade activities
- Draft ToR for design of Rubavu network (2011)