

AFRICAN DEVELOPMENT BANK GROUP



RWANDA

SCALING UP ELECTRICITY ACCESS PROGRAM PHASE II (SEAP II)

APPRAISAL REPORT

PESD/RDGE
September 2018

TABLE OF CONTENTS

CURRENCY EQUIVALENTS	I
FISCAL YEAR	I
WEIGHTS AND MEASURES	I
ACRONYMS AND ABBREVIATIONS.....	II
PROGRAM INFORMATION	III
LOAN INFORMATION	III
FINANCING PLAN	III
KEY FINANCING INFORMATION	IV
EXPECTED DISBURSEMENT	V
TIMEFRAME-MAIN MILESTONES	V
BASIC PROGRAM INFORMATION	V
PROGRAM EXECUTIVE SUMMARY	VI
RESULTS FRAMEWORK FOR RWANDA RESULTS-BASED FINANCING PROGRAM	VIII
1 STRATEGIC CONTEXT	3
1.1 Country context	3
1.2 Sectoral and institutional context	4
1.3 Relationship with Bank Strategy	6
1.4 Rationale for Bank engagement and choice of instrument	6
2 PROGRAM DESCRIPTION	8
2.1 Government program	8
2.2 Bank financed RBF (SEAP-II) program	9
2.3 Program Key Results and Disbursement-Linked Indicators	11
2.4 Key capacity building and institutional strengthening activities	13
3 PROGRAM IMPLEMENTATION	14
3.1 Institutional and implementation arrangements	14
3.2 Results monitoring and evaluation	14
3.3 Disbursement arrangement and verification protocol	15
3.4 Expenditure framework analysis	16
4 KEY ASSESSMENT	17
4.1 Technical assessment	17
4.2 Program economic and financial evaluation	18
4.3 Fiduciary.....	19
4.4 Climate, environmental and social impacts.....	21
4.5 Climate Change and green growth	22
4.6 Integrated Risk Assessment	23
4.7 Program action plan	23
4.8 Legal instruments and authority	23
5 RECOMMENDATIONS.....	24
APPENDIX 1: PROGRAM RESULTS CHAIN AND DISBURSEMENT-LINKED INDICATORS.	I
APPENDIX 2: LESSONS LEARNED AND SEAP-II ACTIVITIES	II

LIST OF TABLES

Table 2-1 : Scope Results Area.....	10
Table 2-2 : RBF Program financing source	10
Table 2-3 : ESSP Program financing source.....	11
Table 2-4: Disbursement Linked Indicators Loan Allocation	13
Table 4-1 : Integrated Risk Assessment summary.....	23

CURRENCY EQUIVALENTS

As of September 10, 2018

1 unit of account (UA) = 1.20 USD

1 Euro = 1.16 USD

FISCAL YEAR

1 July – 30 June

WEIGHTS AND MEASURES

1 metric tonne	=	2,204 pounds (lbs)
1 kilogram (kg)	=	2.200 lbs
1 meter (m)	=	3.28 feet (ft)
1 millimeter (mm)	=	0.03937 inch (“)
1 kilometer (km)	=	0.62 mile
1 hectare (ha)	=	2.471 acres

• m	meter	• KOE	kilogram of oil equivalent
• cm	centimeter = 0.01 meter	• kV	kilovolt = 1,000 volts
• mm	millimeter = 0.001 meter	• kVA	kilovolt ampere (1,000 VA)
• km	kilometer = 1,000 meters	• kW	kilowatt = 1,000 Watts
• m ²	square meter	• GW	gigawatt (1,000,000 kW or 1,000 MW)
• cm ²	square centimetre	• MW	megawatt (1,000,000 W or 1,000 kW)
• km ²	square kilometer = 1,000,000 m ²	• kWh	kilowatt hour (1,000 Wh)
• ha	hectare = 10,000 m ²	• MWh	megawatt hour (1,000 kWh)
• t (t)	metric tonne (1,000 kg)	• GWh	gigawatt hour (1,000,000 kWh)

ACRONYMS AND ABBREVIATIONS

AfDB	African Development Bank	MW	Megawatts
CPIA	Country Policy and Institutional Assessment	NEP	National Electrification Plan
EARP	Electricity Access Rollout Program	NST	National Strategy for Transformation
EDCL	Energy Development Corporation Limited	PDO	Program Development Objective
EDPRS-II	Second Economic Development and Poverty Reduction Strategy	PFM	Public Financial Management
EU	European Union	PPP	Public-Private Partnership
EUCL	Energy Utility Corporation Limited	PRVR	Program Results Verification Report
EWSA	Electricity, Water, and Sanitation Authority	PV	Photovoltaic
ESSP	Energy Sector Strategy Plan	RAP	Resettlement Action Plan
FY	Fiscal Year	RBM	Results-based Management
GDP	Gross Domestic Product	RDB	Rwanda Development Board
GHG	Greenhouse Gas	REG	Rwanda Energy Group
IMF	International Monetary Fund	REMA	Rwanda Environment Management Authority
IPAR	Institute of Policy Analysis and Research	RES	Rural Electrification Strategy
IRMS	Incident Recording and Management System	RURA	Rwanda Utilities Regulatory Authority
IT	Information Technology	SE4ALL	Sustainable Energy for All
kWh	Kilowatt hour	SAIDI	System Average Interruption Duration Index
LCPDP	Least-cost Power Development Plan	SAIFI	System Average Interruption Frequency Index
MINECOFIN	Ministry of Finance and Economic Planning	SCADA/DMS	Supervisory Control and Data Acquisition/Distribution Management System
MININFRA	Ministry of Infrastructure	SSP	Sector Strategy Plan

PROGRAM INFORMATION

SECTOR(S)	Energy
THEME(S)	Scaling Up Electricity Access Program Phase II

LOAN INFORMATION

CLIENT INFORMATION	
Borrower	Republic of Rwanda
Implementing Agencies (Executing Agencies)	Ministry of Infrastructure (MININFRA), Rwanda Energy Group (REG) and its subsidiaries EDCL and EUCL

FINANCING PLAN

FINANCING PLAN			
SOURCE	AMOUNT (EUR MILLION)	AMOUNT (UA MILLION)	INSTRUMENT
ADB	165.59*		LOAN
ADF		53*	LOAN

* UA 138 million equivalent

*EUR 63.61 million equivalent

KEY FINANCING INFORMATION

ADB Loan Key Financing Information	
Loan	EUR 165.59 million
Loan Currency	EUR
Loan Type	Fully Flexible Loan
Tenor	25 years inclusive of Grace Period
Grace period	8 years
Average Loan Maturity	16.75 years
Repayments	17 years (34 equal consecutive semi-annual instalments following the grace period)
Interest Rate	Base Rate +Funding Cost Margin+ Lending Margin + Maturity Premium This Interest Rate will be floored to zero
Base Rate	Floating Base Rate (6-month EURIBOR reset each 1 st February and 1 st August) A free option to fix the Base Rate is available
Funding Cost Margin	The Bank funding cost margin as determined semi-annually on 1 January for the semester ending on 31 December and on 1 July for the semester ending on 30 June.
Lending Margin	80 basis points (0.8%)
Maturity Premium ¹	0,20% per annum
Front-end fee	0.25% of the loan amount payable on the date of entry into force of the Loan (as defined in the General Conditions), and payable no later than sixty (60) days from the date of entry into force or at first disbursement, whichever is the earlier. The Borrower will have the option to pay the Front-end Fee from its own resources, or that same be deducted from the loan proceeds at first disbursement. The Borrower shall pay the Front-end Fee on the full Loan amount notwithstanding any full or partial cancellation of the Loan occurring after the Date of Entry into Force.
Commitment fees	0.25% of the undisbursed amount. Commitment fees start accruing 60 days after signature of the loan agreement and are payable on Payment Dates , including during the Grace Period. The Commitment Charge shall cease to accrue upon full disbursement or cancellation of the Loan.
Option to convert the Base Rate	In addition to the free option to fix the floating Base Rate, the Borrower may reconvert the fixed rate to floating or refix it on part or full disbursed amount. Transaction fees are payable.
Option to cap or collar the Base Rate	The Borrower may cap or set both cap and floor on the Base Rate to be applied on part or full disbursed amount. Transaction fees are payable.
Option to convert loan currency	The Borrower may convert the loan currency for both undisbursed and disbursed amounts in full or part to another approved lending currency of the Bank. Transaction fees are payable.

ADF Loan Key Financing Information	
Loan Currency	Loan in UA but will be disbursed in USD
Loan	UA 53 million
Service Charge	0.75% per annum on loan amount disbursed and outstanding
Commitment fee ²	0.5% per annum on undisbursed portion of the loan
Duration	40 years (including the Grace Period)
Grace period	5 years
Amortisation Rate	2.86% per annum

¹ To be determined based on the tenor of the loan and the Grace Period

² It shall begin to accrue one hundred and twenty (120) days after the date of signature of the Loan Agreement and shall be payable on a Payment Date.

EXPECTED DISBURSEMENT

Expected disbursement in EURM							
Fiscal year	FY 2018/19 Prior amount		FY 2018/19 Advance amount		FY 2018/19 target	FY 2019/20 target	FY 2020/21 target
	Prior amount	as a % of total Loan	Advance amount	as a % of total loan			
Annual	1.29	0.56%	56.98	25%	92.14	86.53	49.24
Cumulative					93.43	179.96	229.20
Annual with advance					150.41	86.53	49.24
Prior results	1.29	0.56%					

TIMEFRAME-MAIN MILESTONES

TIME FRAME – MAIN MILESTONES (expected)	
Concept note approval	May 31, 2018
Board approval	September 27, 2018
Loan signing	October 12, 2018
Effectiveness	November 12, 2018
Launch	November 26, 2018
Program completion	October 30, 2021
Program Completion Report	June 30, 2022
Last disbursement	March 30, 2022

BASIC PROGRAM INFORMATION

Program Development Objective(s)	State objective(s) here	
Compliance		
Policy		
Does the program depart from the Country Strategy Paper in content or in other significant respects?	Y []	N [X]
Does the program meet the eligibility criteria	Y [X]	N []
Is approval for any policy waiver sought from the Board?	Y []	N [X]
Overall Risk Rating: Moderate		
Legal Conditions	Refer to Section 4.8 Legal instruments and authority	

PROGRAM EXECUTIVE SUMMARY

Topic	Description
Program name:	Scaling Up Electricity Access Program Phase II (SEAP II)
Overall timeframe	Three fiscal years covering 2018/19–2020/21
Borrower	Republic of Rwanda
Implementing Agencies (Executing agencies)	Rwanda Energy Group (REG) and its subsidiaries, the Energy Development Corporation Limited (EDCL) and Energy Utility Corporation Limited (EUCL)
Financing Data	ADB loan of EUR 165.59 million and ADF loan of UA 53 million
Program Development Objective (PDO)	The SEAP II PDOs are to improve the power supply reliability, increase on and off-grid access in Kigali and in the Southern and Western provinces and enhance institutional capacity for effective implementation.
Results areas (Components)	The program has four results areas: Results Area 1: Improve reliability of electricity supply with indicative amount allocated of EUR64.36M (28.05%); Results Area 2: Increase on-grid access for households and productive usages with indicative amount allocated to this area of EUR150.08M (64.48%); Results Area 3: Increase off-grid access to renewable energy with indicative amount allocated to this area of EUR8.70M (3.80%); and Results Area 4: Institutional strengthening and capacity building with indicative amount allocated of EUR6.11M (2.67%) (including EUR1.29M for the appointment of OAG)
Disbursement-Linked Indicators (DLIs)	There are in total eight DLIs including one prior result: DLI1-1: Improved System Average Interruption Duration Index (SAIDI) for 30/15 kV, DLI1-2: Installation of SCADA/DMS, DLI2-1: Additional number of new household customers connected to the grid of which 52% are women, DLI2-2: Additional number of productive-use customers connected to the grid, DLI2-3: Additional length of MV (30/15 kV) distribution lines constructed and/or upgraded, DLI3-1: Additional number of new household customers provided with SHS of which 52% are women, DLI4-1: Implementation of the approved annual agreed capacity building and technical assistance program, DLI4-2 (prior result): Appointment of OAG as Independent Verification Agency (IVA).
Alignment with Bank priorities	The program is aligned with the Bank’ Ten Year Strategy (TYS) 2013-2022 for promoting inclusive growth, and gradual transition to Green Growth and its thematic focus on infrastructure development. In particular, the program will contribute to three of the Bank’s High5 priorities namely Lighting up and Powering Africa, Industrializing Africa and Improving the quality of Life for the People of Africa. It is also in line with the Bank’s energy policy to support Regional Member Countries provide access to modern, affordable, reliable energy services and infrastructure. Under the New Deal on Energy for Africa, the operation will contribute to the Power Utility Transformation program and the universal electricity access goal by 2025. The SEAP II fits within the first pillar of the Bank's Country Strategy, namely <i>Investing in Energy and Water Infrastructure to promote inclusive and green growth</i> .

Needs Assessment and Justification	The National Strategy for Transformation (NST-1) is the first of the seven-year programs designed to propel Rwanda into an upper middle-income country by 2035 by diversifying sources of economic growth, reducing poverty, and promoting private sector job creating growth particularly for the youth. To achieve this goal, the NST-1 has prioritized the delivery of sustainable, affordable and reliable electricity services, and aims to achieve universal electricity access by 2024. Following successful implementation of the Energy Access Rollout Program (EARP) that has seen the country more than double electricity access from 18% in 2012 to 44% in 2018, the Government of Rwanda (GoR) wants to sustain the strong momentum by implementing the SEAP II, using the Bank’s new (RBF) instrument.
Harmonization	The Bank actively coordinates its interventions with all Development Partners (DPs) in Rwanda. Through the Energy Sector Working Group, the SEAP II will build upon and consolidate the gains of past and current programs/projects of other DPs, notably, the ongoing World Bank and European Union energy sector budget support operations. SEAP II will also be harmonized with on-going off-grid solutions from other DPs such as the KfW, Arab Funds, GIZ, Power Africa and JICA as well as the private sector.
Bank’s added value	The Bank is one of Rwanda’s leading partner in power infrastructure development, contributing to and leading the Energy Access Technical Working Group. The Bank will therefore leverage its comparative advantage as a de-facto leader and convener to add value by: (i) focusing strongly on implementation support, thereby strengthening the delivery of SEAP II and enhancing regional electricity grid integration; (ii) strengthening incentives and increasing the likelihood of achieving universal access to electricity in Rwanda; (iii) supporting institutional and capacity development to ensure sustainable delivery of energy sector targets beyond SEAP II; (iv) assisting in risk identification, mitigation, and management; and (vi) sharing knowledge and good practices from SEAP II as the Bank’s first ever RBF program. Rwanda's access to long term liquidity at scale and on more competitive terms under the Bank's ADB and ADF windows compared to the Euro bond option complimented by use of the Results-Based Framework (RBF) instrument supports the Government's efforts to fast track the country's transformation while maintaining a strong sovereign balance sheet and a stable macroeconomic environment.
Overall risk rating	Moderate
Contributions to gender equality and women’s empowerment	Rwanda has continually recorded high achievements in closing the gender equality gap, ranking fourth in the world and first in Africa on the 2017 World Economic Forum Gender Gap Index. The positive trend is expected to characterize this program. In particular, 52% of beneficiaries in electricity access connections will be women. Gender mainstreaming and health and safety actions have been included in the RBF action plan. Furthermore, women and children in rural areas will be empowered through the off-grid solutions embedded in SEAP II, which will provide opportunities for women entrepreneurs and improve their welfare through increased income generation activities.
Contribution to green growth and climate change	The program contributes to green growth and climate change mitigation by promoting renewable energy off-grid solutions such as solar home-systems, promoting electricity system efficiency through loss reduction activities and improving system reliability, expanding on-grid electricity access for productive uses throughout the country to support adaptation/resilience goals to climate risks, and reduce dependence on forest biomass for local industries and domestic use.

RESULTS FRAMEWORK FOR RWANDA RESULTS-BASED FINANCING PROGRAM

Results Indicators	DLI (yes/no)	Unit of measure	Baseline (2017/2018)	End Target (2021/2022)	Target values			Frequency	Data source/method	Responsible for data collection
					FY 18-19	FY 19-20	FY 20-21			
Impact										
Outcome										
Improve System Average Interruption Frequency Index (SAIFI) for 30/15 kV	No	Number of interruptions/customer-year	110.17	70.17	-8.00	-14.00	-18.00	Annually	REG/EDCL/EUCL quarterly and annual report. REG quality inspection report, EUCL summary of activities implemented	MININFRA and MINECOFIN
Improve System Average Interruption Duration Index (SAIDI) for 30/15 kV	Yes/DLI	Minutes/customer-year	20.85	14.85	-1.20	-2.10	-2.70	Annually	Same as above	MININFRA and MINECOFIN
Additional number of new household customers connected to the grid of which 52% are women	Yes/DLI	Number	485,994	677,248	110,000	43,003	38,251	Annually	Same as above	MININFRA and MINECOFIN
Additional number of productive usage customers connected to the grid	Yes/DLI	Number	4176	6288	634	1,267	211	Annually	Same as above	MININFRA and MINECOFIN
Reduce Total System Losses	No	Percentage	19.6%	17.0%	-0.65%	-0.65%	-0.65%	Annually	Same as above	MININFRA and MINECOFIN
Additional number of new household customers provided with SHS of which 52% are women	Yes/DLI	Number	241,451	366,251	18,720	68,640	37,440	Annually	Same as above	MININFRA and MINECOFIN
Output										
Installation of SCADA/DMS	Yes/DLI	Installation of DMS system	NO DMS	DMS installed and operationalized	Contract signed with supplier	Manufacturing and supply of equipment.	Installation and operationalization of DMS	Annually	Same as above	EUCL
Additional length of LV distribution lines constructed	No	Circuit-km	12,356	19,673	4,208	1,645	1,463	Annually	Same as above	MININFRA and MINECOFIN
Additional length of MV (30/15 kV) distribution lines constructed and/or upgraded	Yes/DLI	Circuit-km	5,204	5,999	239	477	80	Annually	Same as above	MININFRA and MINECOFIN
Cumulative number of people receiving technical training on Planning, project management etc under the program of which 30% are women	No	Number	365	2,180	708	756	716	Annually	REG quarterly and annual reports, list of people trained, contract of experts procured.	MININFRA and MINECOFIN
Cumulative number people receiving training on financial management under the program of which 30% are women	No	Number	10	83	23	30	30	Annually	Same as above	MININFRA and MINECOFIN
Cumulative number of people receiving training on safeguard under the program of which 30% are women	No	Number	309	1,769	553	608	608	Annually	Same as above	MININFRA and MINECOFIN
Other										
Approval of the ESSP (Energy Sector Strategy Plan)	No	NA	Draft ESSP	NA	NA	NA	NA	NA	MININFRA	MININFRA
Approval of the NEP (national electrification Plan)	No	NA	Draft NEP	NA	NA	NA	NA	NA	REG and MININFRA	REG and MININFRA
Implementation of the approved annual agreed capacity building and technical assistance program	Yes/DLI	NA	Implementation on issue for capacity building and technical assistance	Agreed technical assistance and capacity program implemented	Implementation of the approved agreed capacity building and technical assistance program for the fiscal year 2018/19	Implementation of the approved agreed capacity building and technical assistance program for the fiscal year 2019/20	Implementation of the approved agreed capacity building and technical assistance program for the fiscal year 2020/21	Annual	MININFRA and MINECOFIN	MININFRA and MINECOFIN
Appointment of an Independent Verification Agency (IVA)	Yes/DLI	NA	No IVA	ToR cleared by the Bank and IVA appointed	NA	NA	NA	NA	MININFRA and MINECOFIN	MININFRA and MINECOFIN

REPORT AND RECOMMENDATION OF THE MANAGEMENT OF THE AFRICAN DEVELOPMENT BANK (ADB) AND THE AFRICAN DEVELOPMENT FUND (ADF) TO THE BOARD OF DIRECTORS ON TWO PROPOSED ADB and ADF LOANS TO THE REPUBLIC OF RWANDA TO FINANCE THE SECOND PHASE OF THE SCALING UP ELECTRICITY ACCESS PROGRAM USING THE RESULTS BASED INSTRUMENT.

1- Management submits the following proposal and recommendation for an ADB Loan of USD 194 million and an ADF loan of UA53 million to the Republic of Rwanda to finance the second phase of the Scaling Up Electricity Access Program (SEAP II). The SEAP II is designed as a Results Based Financing (RBF) program covering the fiscal years (FYs) 2018/19-2020/21, for a total indicative financing of UA 191 million. This is the first operation of its kind designed to use the RBF instrument on a pilot basis. The intervention has been prepared in response to a formal request submitted by the GoR in April 2018 where they expressed readiness to pilot the RBF and in a revised version of July 2018 where they applied to allocate more resources for the program.

2- Government efforts to scale up investments and accelerate increased access to electricity are being taken in line with the objectives of the first phase of the National Strategy for Transformation (NST-1) adopted in 2017 to facilitate Rwanda’s transition into a middle by 2024 and to an upper Middle-Income Country by 2035. The NST-1, the first of a series of seven-year programs for achieving Vision 2050, targets universal access to electricity by 2024. In the NST-1 electricity underpins Rwanda’s efforts to diversify sources of economic growth, promote private-sector-led job creating growth, particularly for the youth, and reduce poverty. Households and productive user access to adequate and reliable electricity is expected to drive sustainable agricultural growth, which employs over 70% of Rwandans through powering irrigation systems to improve productivity and promoting value-adding activities in agro-manufacturing industries, in line with the Made in Rwanda policy. Power is also seen as critical in growing the private sector through a focus on tech-enabled export-oriented Small and Medium Enterprises (SMEs). SMEs represent over 90% of all businesses and account for about 41% of employment in Rwanda. In line with the country’s ambition to become a knowledge-based economy, powering technical colleges and higher education centers particularly those focusing on Information and Communication Technology (ICT), mathematics, sciences and research is expected to promote skills development and spur innovation to support export-oriented industries within the Kigali Innovation City vision and the growth of a quality service industry. The expectation is that adequate and efficient industrial energy supply will deliver substantial benefits including energy cost savings; enhanced competitiveness, profitability, production and product quality; and an improved working environment while also reducing operational, maintenance and environmental compliance costs. The NST-1 also seeks to power all health centers, primary and secondary education facilities and public service offices so as to build a healthy and educated workforce while enhancing public service delivery.

3- This operation has been prepared recognizing the remarkable development results that Rwanda has achieved in the electricity sector while also acknowledging the enormous challenges that remain to be addressed to meet the NST-1 objectives. In just seven years (during the implementation of the Energy Sector Strategic Plan (ESSP 2012/13–2017/18), overall access to electricity in Rwanda more than doubled, growing from 18% (17% on-grid and 1% off-grid) to 44% (33% on-grid and 11% off-grid) thanks to political and macroeconomic stability, an aggressive reform program and a unique culture of performance-driven contracts in the public service, locally known as ‘Imihigo’. Over this period, 88% of schools, 76% of health centers and 94% of administrative centers were also connected to electricity. Under the ESSP, the government allocated an average of 1.4% of gross domestic product (GDP) annually to modernize and upgrade the country’s old power distribution system. The authorities also embarked on implementing regional grid-interconnection projects and reformed the power sector to allow for the participation of private investors through the public-private-partnership model as in the case of the multinational Ruzizi III Hydroelectric Power Project, or as independent power producers in the case of the KivuWatt methane gas-to-power project. Twenty

independent power plants based on conventional and renewable energy technologies are in operation today, and only one out of the nine power generation projects scheduled for implementation by 2024 will be financed through the government. Private sector interest in delivering off-grid electricity services has increased since 2012, and more than 30 local and international firms are actively involved. To facilitate implementation of the ESSP, the government has restructured the former Energy, Water and Sanitation Authority to establish the REG comprising two subsidiary companies operating under company law of 2018 ; these are the Energy Development Corporation Ltd (EDCL) responsible for generation and transmission projects and the Energy Utility Corporation Ltd (EUCL), which is the grid operator and in charge of the day-to-day operations of power generation, transmission, distribution and sales to final customers, as well as promoting energy efficiency and demand-side management programs.

4- Notwithstanding the strong results, Rwanda’s efforts to achieve universal electricity access face a number of challenges. As at the end of March 2018, while the urban population enjoyed greater access to electricity, about 83 % of rural dwellers had no electricity coverage. They represented about 6.9 million people. The very hilly Rwandan terrain, which makes most areas hard to reach and increases the cost of infrastructure investment accounts for part of the problem. Rwanda’s investment in the electricity supply is failing to keep up with the sustained high economic growth rates achieved over the past two and half decades and its impact on electricity demand. Consequently, the power system has become increasingly unreliable. The System Average Interruption Frequency Index (SAIFI) for Kigali City for 2017 is 22 outages per year, compared to other cities in the region. At the same time, owing to seasonal variability of most hydropower plants, which are run-of river, fossil fuels account for almost 48% of the energy generated (in 2017) leading to high average electricity tariffs of USD 0.21/kWh compared to Tanzania (USD 0.10/kWh) and Uganda (USD 0.13/kWh). Furthermore, being multinational investments, key regional grid interconnection projects and joint hydropower projects have faced major delays which have locked the country into an expensive thermal based power supply. As a new company, the capacity building in REG will be required in high-level skills for planning, contract management and negotiations

5- The proposed SEAP II is not only timely, but it will also give an enormous impetus to Rwanda’s transformation agenda. The scaled-up resource envelope together with on-going investments positions the Bank as a lead development partner to support Rwanda’s last-mile electricity coverage. The program’s design to disburse on evidence of verifiable results in the areas of stabilization of the power system and universal coverage for Kigali city, the promotion of off-grid investments that will harness partnership with private operators and increase access to renewable energy particularly for hard to reach rural areas and capacity building of the REG directly addresses key bottlenecks that hinder universal coverage and slow down transformation.

6- The program was formulated based on continuous dialogue with the Government of Rwanda (GoR), the REG, and in close collaboration with development partners (DPs) and other stakeholders, including the private sector. The program is demand driven, ensuring strong government ownership of the program and its instrument. In addition, Rwanda has a robust national transformation strategy with clear result areas, including the electricity sector. It has strong political will, a unique culture of performance with demonstrated ability to deliver strong development results and experience in implementing the different variants of an RBF instrument with other DPs.

1 STRATEGIC CONTEXT

1.1 COUNTRY CONTEXT

1.1.1 Rwanda, located in Central/Eastern Africa, is a densely populated (507 inhabitants/km²) country compared to other African countries, with a population of approximately 12 million people and a total area of 26,338 km². Rwanda shares borders with the Democratic Republic of the Congo (DRC) to the west, Uganda to the north, Tanzania to the east, and Burundi to the south.

Political and governance context

1.1.2 Under the multi-party arrangement, Rwanda has achieved successfully organized three presidential elections in 2003, 2010 and 2017 without any political upheaval. The local government elections were also successfully held in February 2016, which led to the election of approximately 40% female councilors.. As chair of the African Union in 2018, Rwanda has successfully facilitated the signing and ratification of the Africa Continental Free Trade Area by over 40 member-states, and has been spearheading finance reforms in the organization.

1.1.3 Sustained implementation of reforms, a prolonged period of peace and political stability, and unwavering donor support are all factors that have contributed to improved governance and impressive development results (*See section 4.3.4 on governance*).

Recent economic developments and macroeconomic fiscal analysis

1.1.4 From 2000 to 2017, the country sustained high economic growth rates with a median average of 7.8% and more than tripled its GDP per capita to USD 774 during the period³. Expansion in investments, which increased from 13% of GDP in 2000 to 23% of GDP in 2017⁴, coincided with the implementation of the Economic Development and Poverty Reduction Strategy (EDPRS) Phases I and II, which took place since 2008. In line with the goals of the Vision 2020 ambitions, the implementation of the social protection strategy, with focus on the poorest, contributed to further reducing extreme poverty from 24% to 0% and poverty from 45% to below 20% by 2020. The country now ranks second in Africa behind Mauritius on the World Bank Ease of Doing Business index compared to 27th a decade ago. It has also made huge strides in closing the gender gap, ranking fourth in the world and first in Africa on the 2017 World Economic Forum Gender Gap Index. Benefiting from strong institutions and the performance-driven public-service contracts ‘Imihigo’, the country now ranks fifth globally and first in Africa on the 2017/18 WEF global index on ‘efficiency in government spending’.

1.1.5 The macroeconomic policy and institutional environment has remained stable and strong. After sustaining high (above regional average) economic growth rates, growth slowed down to 6% in 2016 and 6.1% in 2017 owing largely to drought. Economic rebound is under way with real GDP growth rate projected at 7.2% in 2018 driven by a recovery in the agriculture sector and a robust services sector. Prospects for sustaining the current growth trajectory in the medium term are high as non-traditional exports continue to expand and GoR starts implementing large public infrastructure investments. Inflation remains contained within the National Bank of Rwanda's monetary policy objective as food prices slow down. External sector vulnerability has tapered following exchange rate policy adjustments that has helped improve the current account balance and increased international reserves coverage to four months of imports. Rwanda remains at low risk of public debt distress, thanks to prudent fiscal policies and sound macroeconomic management. As a share of GDP, public and publicly guaranteed debt at 48.1% had steadily increased from 28.6% in 2013 as the authorities increased investments in energy, water and transport infrastructure as well as construction of the Kigali Convention Centre to support the tourism sector⁵. Due to narrowing fiscal space, GoR is increasingly financing flagship public investments through public-private partnerships. Underpinned by the 3-year IMF Policy Support Instrument (PSI) approved in December, 2013 and extended to December, 2018 macroeconomic management recorded a strong performance, and successful completion of the ninth PSI in June, 2018.

³ NISR (National Institute of Statistics Rwanda)

⁴ NISR.

⁵ MINECOFIN Office of the Chief Economist

Government development strategy and medium term priorities

1.1.6 In 2000, Rwanda adopted its Vision 2020, aimed at strategically positioning the country into middle-income status by 2035 through, *inter alia*, increasing electricity access and delivering sustainable, affordable and reliable electricity services. The seven-year NST-1 (2017) covers the years left for Vision 2020 and the first four years of the upcoming Vision 2050. It replaces the EDPRS 2 and underscores GOR's focus on addressing national development challenges while efforts to keep the country at the center of regional integration are beginning to take shape.

1.1.7 In line with its NST-1, Rwanda seeks to build on its strong development achievements of the past two and a half decades, by diversifying its sources of economic growth and promoting the creation of quality jobs by the private sector. GoR is scaling up investments in both economic and social infrastructure. It is also reforming business environment and improving efficiency, effectiveness and accountability in public service delivery. Cognizant of the catalytic impact of energy infrastructure on driving growth across different sectors, the government is targeting 100% access to electricity by 2024.

1.1.8 GoR has established a strong policy, legal, regulatory and institutional framework to fast track economic transformation. Some initiatives undertaken to accelerate economic transformation include the: (i) National Industrial Policy being implemented to promote economic transformation and the creation of 1.4 million new off-farm jobs by 2020; (ii) a new investment code adopted in 2015 to among other things, promote private investments in the strategic sectors (such as industry, agribusiness, the agro-industry and ICT).

1.1.9 The proposed SEAP II operation will support two pillars of the NST-1, especially the economic development and social transformation pillars through four High-Level Target Objectives (HLTOs) of the Energy Sector Strategy Plan (ESSP) 2018-2024 (see Section 1.2.4).

1.2 SECTORAL AND INSTITUTIONAL CONTEXT

1.2.1 Adequate energy infrastructure development is pivotal to realizing Rwanda's Vision 2020 and its succeeding Vision 2050. The Rwanda energy sector is however still facing the following challenges: (i) **unreliable power system** with overloaded network equipment, frequent outages, poor quality of supply and delays in providing new connections. Rwanda is developing very rapidly to a point where interventions in the distribution system expansion and upgrading lag behind the growing demand for electricity. The System Average Interruption Frequency Index (SAIFI) for Kigali City for 2017 is 22 outages per year, which compares poorly with the SAIFI in the region⁶; (ii) **high electricity tariffs**: most of the hydropower plants in operation are run-of-river. Because of seasonal variability, fossil fuels account for almost 48% of the energy generated in Rwanda (in 2017), leading to high average electricity tariffs of USD 0.21/kWh. These tariffs are high compared to the average tariffs in Tanzania (USD 0.10/kWh) and Uganda (USD 0.13/kWh); (iii) **implementation delays of key regional grid interconnection projects** and joint hydropower projects have locked the country to expensive thermal based power supply; (iv) **needs for capacity building** at the Rwanda Energy Group (**REG**) in **high-level skills** for planning, contract management and negotiations are identified as some of the reasons for the poor implementation of projects, slow progress on electricity access program and high cost of electricity.

1.2.2 **The government has reformed the power sector to facilitate entry of the private sector** under the private-public partnership model as in the case of the multinational Ruzizi III Hydroelectric Power Project, or as independent power producers as in the case of KivuWatt methane gas-to-power project. In all, twenty independent power plants based on conventional and renewable energy technologies are in operation today, and only one out of the nine power generation projects scheduled for implementation by 2024 will be financed through the government (see *Annexure 8C*). Private sector interest in delivering off-grid electricity services has increased since 2012, with more than 30 local and international firms actively involved.

⁶ SAIFI in Nairobi is 16.5

1.2.3 The government regularly enacts laws and develops policies and regulations to ensure efficient exploitation of energy resources, coordination of development activities and governance of the energy sector. The Ministry of Infrastructure (MININFRA) supervises the process in collaboration with sector stakeholders, such as DPs, non-governmental organizations and private investors etc. The Electricity Law N°21/2011 of 23/06/2011 governing electricity services in Rwanda, targets liberalization and regulation of electricity services, from production, transmission, distribution to trading. The law also gives MININFRA the rights to grant concession agreements for electricity services and provides the legal basis for the establishment of the Rwanda Utilities Regulatory Agency (RURA) (see *Annexure 4* for sector laws, regulations and decisions).

1.2.4 **Under the just concluded ESSP 2012/13 – 2017/18, the government consistently allocated on average 1.4% of its GDP to modernizing and upgrading the country’s old power distribution system**, increasing access to electricity, fast tracking regional grid interconnection projects, and most importantly reforming the power sector to allow for private participation in the on-grid and off-grid sub-sectors. During the period, the installed capacity increased from 160 MW in 2012 to 218 MW, with 213.5 MW connected to the grid and imports from neighboring countries accounting for 4.5 MW (mainly from the Société Nationale d'Electricité in DRC). The technology mix has also been diversified: Hydro makes up 48% of the installed capacity, Diesel & Heavy Fuel Oil (HFO) 25%, Methane gas 14%, Peat 7% and Solar 6%. The transmission network reached 800 km by end of June 2017, with 470.5 km of 110kV and 273.5 km of 220 kV compared to just 462 km of 110 kV in 2013 facilitating evacuation of power and laying the groundwork for regional power trade. On-grid electricity access to households increased, from 364,000 in June 2012 to 793,966 in June 2018. This represents 33% of all households. Off-grid access has grown from around 1% to 11%, with 256,670 households connected by June 2018, mostly with solar home systems (SHSs). To date, overall access to electricity in Kigali is 82%, followed by Eastern, Western, Northern and Southern Provinces with 39%, 38%, 34% and 30% respectively. However, the rural access rate remains at 17% compared to the urban one at 83%.

1.2.5 To implement the NST-1, the ESSP 2018-2024, identifies eight HLTOs covering three sub-sectors - Electricity, Biomass and Petroleum: (i) generation capacity increased to ensure that all demand is met and a 15% reserve margin is maintained; (ii) reliability of electricity supply improved by reducing the average number of power interruptions per year to 19.3 and average number of hours without power to 9.3; (iii) household access to electricity services increased to 100%; (iv) productive user access to electricity increased to 100%; (v) street lighting extended to all populated areas and main roads; (vi) losses in the transmission and distribution networks reduced to 15% from 23% at end of June 2017, (vii) the number of households depending on firewood as a source of energy for cooking halved to 42%, and (viii) petroleum strategic reserves increased to cover three months’ supply. To achieve these outputs, sustained support to the energy sector through existing and new instruments, such as the Bank’s RBF, will be necessary. These targets are in line with the aspirations of the New Deal on Energy for Africa – notably that of universal electricity access by 2024.

1.2.6 **Institutional arrangement:** To align the energy sector institutional structure with the government development plans and to facilitate implementation of the ESSP, GoR restructured the Energy Water and Sanitation Authority (EWSA) into the REG and Water and Sanitation Corporation (WASAC Ltd) in 2013. The REG comprises two subsidiary companies; the EDCL and the EUCL both of which have operated under company law since August 2014. The EDCL is responsible for developing both generation and transmission projects, and executing a least cost power development plan for the entire country. The EUCL is the grid operator and in charge of day-to-day operations of power generation, transmission, distribution and sales to final customers and takes charge of the transmission and distribution system planning in areas already connected to the grid, as well as promoting energy efficiency and demand side management programs. The two utilities are accountable to MININFRA for policy guidance and to RURA for utility services and performance standards. GoR continues to develop appropriate policies and legislation, and regularly reviews existing laws to align them with the national energy development objectives.

1.2.7 **Donor coordination in the energy sector:** DPs actively support Rwanda energy sector and coordinate their activities through the Energy Sector Working Group supported by four Technical Working Groups (TWG), including the Bank-led Electricity Access Working Group. The design of the SEAP II takes into consideration the complex operational relationship among the DPs in the country and aims at ensuring complementarity and alignment. In particular, the World Bank-funded Programmatic Energy Sector Development Policy financing shares similar sector performance indicators, albeit with a different timeframe. In the off-grid subsector, the GoR is working with the private sector in the development of an implementation framework for NEP with the support from DFID and GIZ among others. The Bank and the DPs discussed the links between these operations and the RBF during the appraisal of the SEAP II (see *Annex 8C*)

1.3 RELATIONSHIP WITH BANK STRATEGY

1.3.1 The proposed SEAP II fits into the first pillar of the Bank’s Country Strategy Paper (CSP), 2017-2021 for Rwanda namely “Investing in energy and water infrastructure to enable inclusive and green growth”, through the provision of electricity access to households including rural households (through off-grid renewable energy) and productive users, as well as the improvement of power service reliability for citizens. As noted above, despite Rwanda’s achievements in electrification in the past decade, the sector is still in need of investments throughout the energy value chain to meet the growing demand (at 8% per annum), to balance the supply and demand, and improve the reliability and quality of service delivery.

1.3.2 The program is aligned with the twin objectives of the Bank’s Ten Year Strategy (TYS) 2013-2022 of promoting inclusive growth, and gradual transition to green growth and its thematic focus on infrastructure development. In particular, the program will contribute to three of the Bank’s High 5 priorities agenda adopted to accelerate the TYS namely Lighting up and Powering Africa, Industrializing Africa and Improving the Quality of Life for the People of Africa. It is also in line with the Bank’s energy policy to support Regional Member Countries provide access to modern, affordable, reliable energy services and infrastructure. Under the New Deal on Energy for Africa, the operation will be contributing the Power Utility Transformation Program and the universal electricity access goal by 2025.

1.4 RATIONALE FOR BANK ENGAGEMENT AND CHOICE OF INSTRUMENT

1.4.1 **GoR requested Bank support following the successful implementation of the multi-donor-funded Electricity Access Rollout Program (EARP),** of which the Bank SEAP I was an important component. The program targeted a 70% electrification rate by December 2018 through a combination of on-grid and off-grid solutions. Due to financing challenges and the lengthy approval requirement associated with the investment lending financing instrument, GoR had to revise this target down to 52% by 2018. For this reason, the government is exploring efficient and faster disbursing instruments to meet its new access targets.

1.4.2 **The proposed SEAP-II will support Rwanda’s economic transformation:** In the NST-1 electricity underpins Rwanda’s efforts to diversify sources of economic growth, promote private sector-led job creating growth and reduce poverty. Access by households and productive users to adequate and reliable electricity is expected to drive sustainable agricultural growth, which employs over 70% of Rwandans through powering irrigation systems to improve productivity and promoting value-adding activities in agro-manufacturing industries, in line with the Made in Rwanda policy. Power is also seen as critical in growing the private sector in general and with a focus on tech-enabled export oriented Small and Medium Enterprises (SMEs). SMEs represent over 90% of all businesses and accounts for about 41% of employment in Rwanda. In line with the country’s ambition to become a knowledge based economy, powering technical colleges and higher education centers particularly those that focus on Information Communication and Technology (ICT), mathematics, sciences and research is expected to promote skills development and spur innovation to support export oriented industries within the Kigali Innovation City vision and the growth of a quality services industry. The NST-1 also seeks to power all health centers, primary and secondary education facilities and public service offices. The expectation is

that adequate and efficient industrial energy supply will deliver substantial benefits including energy cost savings for increased competitiveness, and reducing costs for operation and maintenance, and for environmental compliance. The avoided expenditures by households on energy forms that are substituted by electricity are likely to yield high savings, which in effect increase the real incomes of these households. The 2018/19 budget plans to increase electricity consumption by 11.9% in the medium term as well as increase generation of electricity and strengthen transmission lines. Adequate and high-quality electricity supply is especially important to commercial and industrial customers for sustained growth, thus enhancing the country's chance to graduate to ADB country.

1.4.3 Bank's intervention in SEAP II will reduce GoR financing cost and prevent it from the alternative – the bond market – at a higher market rate. In addition, the blend of ADF and ADB instruments will help scale up resources to the required level and reduce impact on the sovereign balance sheet.

1.4.4 **Relationship with the Bank's SEAP I and Lessons learned:** As noted previously, the power sector has faced many constraints, under past and ongoing Bank operations. These constraints have resulted in slow implementation and disbursement of proceeds leading to delayed realization of project benefits. The main constraints are: (i) Low quality at entry; (ii) Project design delays; (iii) procurement delays; (iv) lack of capacity during project implementation; (v) cost overrun; (vi) inadequate knowledge capture and retention. Under SEAP I investment lending operation, the Bank provided US\$46M for upgrading two major distribution substations and constructed 1365 km of MV and LV network for on-grid access to 30,636 households, 32 health centers, 210 schools and 52 sector administrative facilities in six districts. The project was implemented over a 6-year period through EPC contractors. The effective cost of each additional connection is US\$1,400. By utilizing REG'S in-house skills, and local contractors, and use of country systems, the SEAP II through the RBF instrument is expected to deliver among others, 193,366 on-grid connections within three years at an average cost of around US\$900 per connection. This demonstrates the cost effectiveness of the RBF instrument and the reason it has become the instrument of choice for Government financing in various sectors including energy.

1.4.5 **Relationship with other Bank operations:** The Bank Group's active portfolio in Rwanda comprises 34 operations with a total commitment of UA 636M. Infrastructure represents the largest share of the portfolio (77%) with thirteen projects distributed across three sectors including transport (37%), energy (18%) and water & sanitation (22%). Portfolio performance is assessed as satisfactory with rating of 3.4 (on a scale of 1 to 4). As at June 2018, cumulative disbursements reached UA 230.07 million, which corresponds to a disbursement rate of 36.3% (see *Annexure 8C* for AfDB activities).

1.4.6 **The use of RBF as a lending modality** in the energy sector will enhance the Bank's responsiveness to the growing energy needs outlined in the ESSP while at the same time position the Bank to play a bigger role in helping meet such demands in a much more effective manner. GoR has the right institutional frameworks, including performance management principles that are best suited for the RBF instrument. The proposed RBF program is carved out of the ESSP to help the government accelerate its delivery by:

- Supporting the achievement of some of the ESSP HLTOs including, improving power system reliability and increasing on-grid and off-grid electricity access for household and productive-use. Disbursements would be based on the achievement of agreed tangible outputs and outcomes instead of expenditures, as is the case in investment lending projects.
- Allowing EUCL and EDCL to use their own systems for implementation, while simultaneously supporting the improvements of those systems. Analysis of past budget execution has showed that EUCL and EDCL have generally achieved higher rates (91% in the past three years) of budget execution when using their own systems as opposed to those of DPs (less than 85%).
- Reducing transaction costs by using the government's budget systems and improving the effectiveness of expenditure program of the REG and its subsidiaries.

1.4.7 **The GoR’s interest in piloting RBF** stems from the fact that it is already implementing performance management approaches aimed at rapid transformation of the public service into a vibrant, value-driven, results-oriented institution responsive to citizen needs. As such, GoR is continuously seeking innovative ways and financing instruments to improve and strengthen its capacity to deliver services and expedite the ESSP implementation. The RBF instrument therefore provides a unique opportunity to deliver GoR’s energy sector goals in an integrated manner that allows effective and efficient management of organizational budgets and performance to increase access to reliable and affordable energy supply. The proposed SEAP II is underpinned by an effective and efficient performance management system with clear lines of accountability and linkages between organizational performance and individual staff performance to achieve program implementation outcomes, as required by the Bank’s RBF Policy. It has committed to establishing a dedicated technical and operational unit to ensure the SEAP-II’s success.

1.4.8 **The RBF instrument will enhance harmonization and in-country coordination:** The proposed program will be consistent with the increasing trend towards using RBF-type instruments in Rwanda from DPs. For example, the World Bank has three similar on-going operations in agriculture, skills development and energy sector Development. The key driver of the shift is to generate the same results as IL, but in a much more efficient and effective manner. This shows that where there are strong government commitment, effective policies, and sound national systems to deliver tangible outputs and outcomes, it is best to use results based financing instruments to maximise results delivery through faster implementation.

1.4.9 **SEAP-II and electricity tariff:** While the proposed RBF operation will improve the utility revenues and financial standing, the implementation of the ESSP and NEP will determine the tariff trajectory. Indeed, GoR is supporting least cost generation (see Annexure 8C) which will contribute to lowering the tariff.

1.4.10 **The RBF is suitable for supporting distribution activities:** From experience gained during past and ongoing operations (*see Section 1.4.4 and Table A1-1*), RBF was selected for the proposed operation, hence the GoR interest in piloting the latest Bank instrument. RBF is suitable for supporting distribution activities because the outputs and outcomes of distribution activities are easily measurable and verifiable. These criteria are critical for an instrument that disburses based on tangible results rather than expenditure.

2 PROGRAM DESCRIPTION

2.1 GOVERNMENT PROGRAM

2.1.1 **The wider government program:** As noted above, the ESSP aims to ensure that HLTOs for the energy sector are met. It builds on the progress made under EDPRS 2 and identifies new approaches to deliver improved performance. Four HLTOs of the ESSP are being supported under the proposed RBF (*see Section 1.2.5 and Table A1-1*).

2.1.2 **The ESSP is fully costed with an implementation plan⁷.** The government program is costed at around US\$3.3B and over half of this total (US\$1.7B) will be devoted to building additional generation capacity and related transmission infrastructure. A mixture of funding sources will be used, including government budget, DP support and private sector investments. Even under the most optimistic resource mobilization efforts, funding is limited and projects must be efficiently prioritized (See *Table 2-3* below).

2.1.3 GoR has an ambitious target of increasing access to electricity from the current 44% by end June 2018 to 100% by end 2024, through a combination of grid electrification and off-grid solutions.

2.1.4 **The program implementing agencies:** REG and its subsidiaries, EDCL and EUCL, have demonstrated improved professionalism in delivering distribution network projects and managed both the consultancy and construction contracts in a satisfactory manner under SEAP I, which was rated

⁷ Republic of Rwanda, Ministry of Infrastructure Energy Sector Strategic Plan 2018/19 – 2023/2024, Tables 29 and 31

highly satisfactory overall. EDCL and EUCL will continue to implement the program for sustained momentum.

2.2 BANK FINANCED RBF (SEAP-II) PROGRAM

2.2.1 Program description

2.2.1.1 The proposed SEAP II program to be supported by the Bank will seek to improve power supply reliability, increase on-grid access in Kigali city and countrywide and increase off grid access in the Southern and Western provinces. The expansion and rehabilitation of the distribution network as well as the improvements in reliability will contribute to making more electricity available for consumers in the region. It is anticipated that 318,166 new customers, including 193,366 on-grid and 124,800 off-grid, will have access to electricity through the SEAP-II program.

2.2.1.2 The RBF will cover the first three years of the ESSP's period (2018-2024), for an amount of EUR229.2M or about 8.1% of the ESSP financing.

2.2.2 Program activities

2.2.2.1 The SEAP II is a three-year RBF program starting in 2018 with the loan allocation as follows: 28.05% to improve power system reliability, 64.48 % to increase on-grid access, 3.80 % to increase off-grid access, 2.67% to strengthen institutions and for capacity building and technical assistance. The four areas supported are closely intertwined, as follows:

2.2.2.2 **Results Area 1:** Improve reliability of electricity supply: The activities under this component will involve expanding distribution systems and upgrading the 30/15kV lines and substations and installing a Supervisory Control and Data Acquisition Distribution Management System (SCADA DMS). This improvement will help reduce outages and voltage fluctuations. The relevant indicators for the frequency and duration of outages are the SAIFI and the System Average Interruption Duration Index (SAIDI). Decreases in the frequency and duration of outages and voltage fluctuations in areas supported by the program will measure the improvement of reliability and quality of services. The indicative amount allocated to this area is EUR64.36M.

2.2.2.3 **Results Area 2:** Increase on-grid access for household and productive usages: The main objective is to increase on-grid customer base by connecting an additional 51,254 customers in Kigali city to reach 100% access by 2019, connecting 2,112 productive-use customers, and 140,000 other customers with prepaid meters countrywide. The activities will involve extension and constructing MV (30 and 15kV) distribution lines and additional LV lines, installing distribution transformers, and procuring and installing prepayment meters. The number of customers connected to the network would measure the degree of additional access achieved by the program. It is worth mentioning that the expansion and rehabilitation of the distribution network as well as the improvements in reliability under Results Area 1 above will contribute to make more electricity available for consumption by consumers in the Kigali city and other regions of the country under Results Area 2 activities. The indicative amount allocated to this area is EUR150.08M.

2.2.2.4 **Results Area 3:** Increase off-grid access to renewable energy: Low-income, isolated rural households will be supported in accessing off-grid solutions such as SHSs to increase access. Activities in this area mainly includes SHSs for remote areas of the country with challenging terrain and scattered settlements where grid connection is difficult and where neither the grid nor the private sector distribution channels will reach in the near term. In line with the National Electrification Plan (NEP), the proposed RBF will support selected off-grid service delivery activities, for 124,800 households in selected two provinces (the Southern and Western provinces) where the electrification rates are currently below 50%. The number of SHS installed will measure the degree of additional off grid access achieved. To address gender inequality, 52% of people to have access to electricity will be women. The Bank's RBF off-grid area will be implemented in such a manner to ensure its complements with ongoing private-sector-led initiatives, and is in line with the GoR's energy sector policies. The indicative amount allocated to this area is EUR8.70M.

2.2.2.5 **Results Area 4:** Institutional strengthening and capacity building: A range of conventional and new skills is required to deliver the SEAP-II. A capacity building and technical assistance program will address identified specific skills gaps in the REG in planning, procurement, program management, contract management, E&S, engineering design etc. The indicative amount allocated to this area is EUR2.67M.

Table 2-1 : Scope Results Area

Scope Results Area	
Expected Results	Geographic Scope
Results Area 1: Increase power system reliability	
Reduce the frequency and duration of power outages	Countrywide with focus on Kigali
Results Area 2: Increase on-grid access for household and productive-use customers.	
Increase access by connecting 193,366 new customers including 191,254 household and 2,112 productive-use customers	Kigali city and countrywide
Results Area 3: Increase off-grid access to renewable energy	
Increase access by connecting 124,800 new customers with SHSs	Western and Southern regions
Results Area 4: Institutional Strengthening and capacity building	
Improved reporting system and training to REG, EDCL, EUCL	REG, EUCL and EDCL

2.2.3 **Program beneficiaries:** The primary program beneficiaries include: (i) more than 193,366 customers who will be connected to the grid and benefit from a more reliable energy source; (ii) 124,800 low income customers who will be provided with SHSs; (iii) existing industrial, commercial and productive-use customers who will benefit from increased quality of service because of improved power system reliability; (iv) local contractors for supply and installation; and (v) the local population to benefit from increased employment opportunities during the project implementation. The increased access to electricity will benefit both women and men, with the expectation that 52% of beneficiaries/people will be women. It is anticipated that off-grid solutions will provide opportunities for women entrepreneurs and improve the welfare, income generation and empowerment of women and children – girls in particular – in rural areas.

2.2.4 **Excluded activities under the RBF program:** Consistent with the Bank’s RBF Policy, the following activities will be excluded from SEAP-II: (i) any activity that requires the preparation of Full Resettlement Action Plan (RAP) and any other high risk/impact activity classified as Category One under the Bank’s Integrated Safeguards System (ISS); and (ii) high-value individual contracts (US\$50M for works, turnkey & supply & installation contracts, US\$30M for goods; US\$20M for ICT systems and non-consulting services, US\$15M for consulting services). The following table summarizes the key results:

2.2.5 **Program financing**

Table 2-2 : RBF Program financing source

Source	Amount (EUR M)	Amount (UA M)	Instrument
African Development Bank - ADB	165.59	138	Loan
African Development Fund - ADF	63.61	53	Loan
Total	229.20	191	Loan

Table 2-3 : ESSP Program financing source

Category	Financing Plan of ESSP (2018-2024)	
	Cost (EURM)	%
Program cost	2,845	100.0%
Financiers		
AfDB SEAP-II	229.20	8.1%
AfDB (others)	17.24	0.6%
GoR	372	13.1%
World Bank	247	8.7%
European Union	60	2.1%
Other financiers	18	0.6%
Financing gap	1,901	66.8%

2.2.6 Program Development Objective(s)

2.2.6.1 The SEAP-II PDOs are to improve the power supply reliability, increase on and off grid access in Kigali city and in the Southern and Western provinces and enhance institutional capacity for effective implementation of the government’s electrification program. The program results chain is summarized in *Appendix 1*. The following outcome indicators will be used to measure achievement of the PDO: (i) **PDO Indicator 1:** Reduction in average number and frequency of interruptions, (ii) **PDO Indicator 2:** Number of household and productive-use customers provided with on-grid electricity services; (iii) **PDO Indicator 3:** Number of people provided with off-grid electricity access; and (iv) **PDO Indicator 4:** Improved planning and implementation capacity of the electricity sector (to support the achievement of the above).

2.3 PROGRAM KEY RESULTS AND DISBURSEMENT-LINKED INDICATORS

2.3.1 Disbursement-Linked Indicators (DLIs) will form the basis for disbursement. The selected DLIs are expected to enhance the focus on key results and improve the reliability of the system, as well as increase on-grid and off-grid access. They comprise a blend of outcome, output, and process indicators.

2.3.2 **Results chain and DLIs:** The selection of DLIs was guided by three (3) key considerations. For each result area, the use of the identified outcome indicators as DLIs was considered first as this would directly provide the incentives for meeting program goals. The second step was to consider the feasibility of measuring, monitoring and verifying the indicators. Finally, the choice of specific intermediate/output indicators was guided by their significance in signaling progress towards achieving the planned outcomes. There are in total eight DLIs in total including one prior result DLI. *Appendix 1* shows the program results chain and summaries the expected outcomes, intermediate indicators, and relevant activities undertaken to achieve the PDO.

2.3.3 **Prior results:** Prior result in this RBF program will be the approval of the Terms of Reference (ToR) for the appointment of the OAG as the Independent Verification Agency (IVA) to verify achievement of the RBF results by the Bank. The proposed IVA for this operation is the Office of the Auditor General (OAG) for several reasons, not least being that it has been used as an IVA for four World Bank equivalent RBF operations in Rwanda. The OAG therefore has the capacity and mandate to provide credible and independent opinions on the results achieved.

2.3.4 **Advance.** An advance finance of up to 25 % of the loan amount will be provided for the much-needed financial resources to kick-start implementation activities. GOR will send a request for advance to the Bank after loan effectiveness. Subsequently, a request for all future advances under the program is needed.

2.3.5 **Table 2-4** shows the allocation of the ADB Loan to the eight DLIs, which was guided by their relative impact/contribution to achieving the RBF program objectives (see *Annexures 2A, 2B and 2C*).

2.3.6 **Improved power system reliability:** The SAIDI and SAIFI are the best outcome measures for system reliability. However, EUCL procedures for measuring of SAIFI and SAIDI countrywide while improving are still a work in progress to which the RBF will help strengthen. The Bank and the GoR have agreed to use SAIDI for the Kigali city as DLI and SAIFI as an indicator that will be monitored. The program will also provide for the installation and operationalization of a SCADA DMS, which will also be a DLI because of its importance in improving the power system reliability. The upgrade of the system will help improve the reliability and quality of service. The Bank and the GoR have agreed to focus on improving network characteristics and operations, including through training for network planning to minimize losses.

2.3.7 **Improved on-grid access to electricity:** increasing on-grid access is one of the HLTOs. The number of residential customer and productive-use connections are key indicators used by both the REG and the GoR to assess the progress achieved toward the country's electrification goals. This is a direct outcome measure for access that is straightforward and easy to measure, monitor and verify. In addition to this indicator, the Bank and GoR agreed to also use the length of additional MV distribution lines as an additional DLI for increased access, given that it is an important signal of progress towards increasing customer connections. The additional number of transformers connected will help REG to focus on reducing LV feeder lengths and increasing MV coverage which in turn help reduce technical losses in the LV system.

2.3.8 **Improved off-grid access to renewable energy:** The relevant DLI will be the number of households provided with SHSs. Activities in this area will be implemented in a manner to ensure complementarity with ongoing private sector interventions, and compliance with GoR's energy sector policies.

2.3.9 **Institutional strengthening and capacity building:** There is one prior result and one DLI included in this results area. These are as follows: (i) implementation of the approved annual agreed capacity building and technical assistance program to provide the REG with an incentive to approve and execute the work plan with capacity building and technical assistance; and (ii) Bank approval of the ToR for an IVA. The selection of an IVA will provide independent verification of program results. The measures supported by the institutional strengthening and capacity building results area are expected to positively impact implementation of the entire distribution program as well as its operations beyond the selected zones. A concerted effort will be made to ensure gender balance in staff receiving capacity building. A list of capacity building activities under DLI4-1 as well as technical assistance have been agreed with government and will be verified against payment by an IVA (*See Annexure7B*).

Table 2-4: Disbursement Linked Indicators Loan Allocation

Results Areas and DLIs	Indicative Loan allocation per area and per DLI	% of allocation per area	Allocation ADB/ADF				Total disbursed in 2018 with advance								
							FY 2018/19 Prior amount				FY 2018/19 Advance amount				
			Total	ADB		ADF		Total	ADB	ADF		Total	ADB	ADF	
			EURM	UAM	EURM	UAM	EURM	EURM	UAM	EURM	EURM	UAM	EURM	EURM	UAM
Total RBF financing 2018-2022	229.20		165.59	138.00	63.61	53.00	1.29	0.00	1.08	1.29	56.98	41.40	12.98	15.58	
		100.00%					0.6%				24.9%				
Target date for disbursement							Nov-18	Nov-18		Nov-18	Nov-18	Nov-18		Nov-18	
Results Area 1 : Increased power system reliability	64.30	28.05%	15.51	12.93	48.79	40.66	0.00	0.00	0.00	0.00	16.08	3.88	10.16	12.20	
DLI-1.1 Improve System Average Interruption Duration Index (SAIDI) for 30/15 kV	41.80	18.24%	15.51	12.93	26.29	21.90	0.00	0.00	0.00	0.00	10.45	3.88	5.48	6.57	
DLI-1.2 Installation of SCADA/DMS	22.51	9.82%	0.00	0.00	22.51	18.75	0.00	0.00	0.00		5.63	0.00	4.69	5.63	
Results Area 2: Increase on-grid access for household and productive-use customers	150.08	65.48%	150.08	91.43	0.00	0.00	0.00	0.00	0.00	0.00	37.52	37.52	0.00	0.00	
DLI-2.1 Additional number of new household customers connected to the grid of which 52% are women	82.39	35.95%	82.39	68.66	0.00	0.00	0.00	0.00	0.00	0.00	20.60	20.60	0.00	0.00	
DLI-2.2 Additional number of productive usage customers connected to the grid	27.33	11.92%	27.33	22.77	0.00	0.00	0.00	0.00	0.00	0.00	6.83	6.83	0.00	0.00	
DLI-2.3 Additional length of MV (30/15 kV) distribution lines constructed and/or upgraded	40.37	17.61%	40.37	33.64	0.00	0.00	0.00	0.00	0.00	0.00	10.09	10.09	0.00	0.00	
Results Area 3: Increase off-grid access to renewable energy	8.70	3.80%	0.00	0.00	8.70	7.25	0.00	0.00	0.00	0.00	2.18	0.00	1.81	2.18	
DLI-3-1 Additional number of new household customers provided with SHS of which 52% are women	8.70	3.80%	0.00	0.00	8.70	7.25	0.00	0.00	0.00	0.00	2.18	0.00	1.81	2.18	
Results Area 4: Institutional Strengthening and Capacity Building	6.11	2.67%	0.00	0.00	6.11	5.10	1.29	0.00	1.08	1.29	1.21	0.00	1.00	1.21	
DLI-4-1 Implementation of the approved annual agreed capacity building and technical assistance program	4.82	2.10%	0.00	0.00	4.82	4.02	0.00	0.00	0.00	0.00	1.21	0.00	1.00	1.21	
DLI-4-2 Appointment of an Independent Verification Agency (IVA)	1.29	0.56%	0.00	0.00	1.29	1.08	1.29	0.00	1.08	1.29	0.00	0.00	0.00	0.00	

2.4 KEY CAPACITY BUILDING AND INSTITUTIONAL STRENGTHENING ACTIVITIES

2.4.1 An important feature of this operation is institutional strengthening and capacity building to further improve the REG, EDCL and the EUCL's effectiveness in implementing Rwanda's power distribution program. The technical, fiduciary and environmental and social assessments have identified several areas for systems strengthening.

- **Technical:** While the technical capacity and monitoring and supervision arrangement are satisfactory, the complexity of the Bank's RBF program calls for the provision of additional expertise, particularly in distribution system design, procurement, project management/monitoring and evaluation, and in distribution system operational performance. Specific training will be provided for energy planning, rural electrification, construction and supervision of power infrastructure, operations and maintenance, loss reduction, standards, network protection, power system efficiency and project management. These are included in DLI4-1. Technical assistance will be also provided under the program.
- **Financial management and procurement:** Technical assistance will be provided to strengthen the REG team to accelerate its procurement processes. Audit and compliance training will also be undertaken during the program implementation. A capacity building program will be delivered on the design of technical specifications, negotiations, contract management and monitoring of procurement plans. With proper capacity building support in the areas of negotiation skills, projects and contracts management, preparation of technical documents, etc., the implementing agencies can handle procurement activities envisaged under the program (see details in *Annexure 7B*).

- **Environmental and social impact assessment:** Training on safeguards and program level environmental protection, gender mainstreaming and health and safety has been included in the RBF action plan for the safeguard teams of the implementing agencies. Furthermore, two more safeguard specialists (one environmental and one sociologist) will be recruited to strengthen the technical capacity of the EDCL for the preparation of the impact assessment.

2.4.2 The IVA will be financed under the RBF program. The capacity building and system strengthening measures have been incorporated into the program design either as DLIs (DLI4-2 and DLI-4-1) or activities to be implemented under the Program Action Plan (see *Annexure 7A*).

3 PROGRAM IMPLEMENTATION

3.1 INSTITUTIONAL AND IMPLEMENTATION ARRANGEMENTS

3.1.1 The Ministry of Finance and Economic Planning (MINECOFIN) will provide oversight and ensure interface between the Bank and implementing agencies. MININFRA will also provide overall oversight and strategic guidance for the program. REG, EDCL and EUCL will be the SEAP-II implementing agencies (IAs). MININFRA generally supervises REG project development and implementation activities and coordinates DP activities through the SWG to ensure efficiency in sector planning and the use of resources.

3.1.2 The physical implementation of the SEAP II activities – including planning, design, procurement and construction/installation of equipment will be carried out within the existing REG organizational framework. The EARP will implement program Area 1 and 2 under the EDCL except the SCADA DMS installation, which the EUCL will implement. The primary and social energies department under the EDCL will implement activities in Area 3. The REG human resources department will implement the capacity building activities in Area 4.

3.1.3 The MINECOFIN will sign a subsidiary agreement with EDCL that will include terms of proceeds of the financing made available to the REG and its subsidiaries and their responsibility in carrying out activities under the program (*see Annexure 1*).

3.1.4 REG has been carrying out similar technical activities over the years, for example the EARP and its staff members are experienced and capable of managing the distribution activities under the SEAP-II

3.1.5 MININFRA will also constitute a Program Technical Unit (PTU) to oversee the day-to-day implementation of the SEAP-II and facilitate the collection and collation of evidence of achievement of the DLIs. The unit will comprise key specialists including the REG director of planning as the secretary, the coordinator of the EARP as chairperson, the EDCL director of primary and social energies department, the EDCL director of energy planning, the EUCL director of operations, the EDCL head of procurement, the REG head of monitoring and evaluation, the REG's HR director, Chief Financial Officer and EDCL FM director.

3.2 RESULTS MONITORING AND EVALUATION

3.2.1 While the MININFRA through the energy department will be tasked with the overall program coordination, the REG will report achievements of its tasked activities through the energy division. The REG planning department already monitors the utility's key performance indicators (KPIs), while the quality control and process assurance department monitors KPIs from each of its regional departments. The REG prepares quarterly and monthly reports for its board and the MININFRA.

3.2.2 The REG and the MININFRA have M&E frameworks and systems in place. However, the reporting is not systematic. Under the SEAP II, the reporting issues will be addressed, and procedures will be streamlined under the institutional strengthening and capacity building component. Most of the data sources will be from management, quarterly and annual reports as well as financial statements/reports.

3.2.3 The PTU will meet regularly but at least once every quarter to review the progress of the RBF operation, and ensure the timely achievement of results and document the level of DLI achievement.

3.2.4 In line with the Bank's RBF Policy, MINECOFIN will retain the OAG as IVA under ToRs acceptable to the AfDB to verify the achievement of DLI results. The IVA will conduct the verification and conduct surveys with an agreeable sample size for achieved results to be verified under DLIs 1-1, DLI2-1, DLI2-2, DLI2-3, DLI3-1, and DLI4-1. The IVA will verify that connections comply with acceptable quality standards, as established by the REG, as well as conduct site visits. *Annexure 2B* gives details on the DLI expected achievement and verification protocol.

3.2.5 During implementation, AfDB and MININFRA will carry out periodic reviews, through among other supervision, of REG and IVA reports, as necessary, and evaluate the overall appropriateness of the verification arrangements, and take mitigation measures, as needed.

3.2.6 The program's mitigation measures for effective monitoring will include monthly reports prepared by the technical unit, and monitoring through quarterly reports that will be submitted to the Bank no later than fifteen days after the end of each quarter.

3.3 DISBURSEMENT ARRANGEMENT AND VERIFICATION PROTOCOL

3.3.1 Verification protocol of the program

3.3.1.1 The indicative timelines for DLI achievement are in FYs (July 1 to June 30), for which the annual targets to be achieved are proposed. However, the GoR can request the Bank for disbursement when significant results have been achieved. Per GoR request, the first verification for disbursement is expected to start in March 2019 and for Year 1 (2018/2019). All subsequent disbursements will be on an annual basis following the FY, except for Year 1 (2018/2019).

3.3.1.2 The IVA will verify results through management reports, quarterly and annual reports, financial audits, procedural verification, and physical inspection that will test the completeness, accuracy and quality of results reported by REG. In accordance with good audit practice, physical verification will take place against a sampling framework of no less than 20% of agreed activities and frequency. The MININFRA and MINECOFIN will prepare the ToR for the IVA, which should be satisfactory to the Bank and, compliant with the agreed DLIs, and activities, the verification protocol, and the timeline. A workshop on the verification process will be organized in mid-October 2018 with all the relevant stakeholders.

3.3.1.3 The IVA will use the verification protocol as the basis for the preparation of a Program Results Verification Report (PRVR) that will be submitted to the Bank (*See Annexure 2B*).

3.3.2 Disbursement arrangement

3.3.2.1 Aligned with the provisions for the RBF, the Bank will disburse the funds into a foreign currency account opened by GoR at the National Bank of Rwanda (BNR) to receive the proceeds from SEAP-II resources. The local currency equivalent of the funds deposited at the BNR will be transferred to the Consolidated Fund (Treasury Single Account (TSA)) of GoR. From the TSA, the funds will be transferred to IAs in line with the country's systems, budgetary priorities and voted budgetary law for each of the corresponding FYs. The budgeted expenditures will be accounted for exclusively within the country's Integrated Financial Management System (IFMIS), which includes the TSA.

3.3.2.2 The loan proceeds will be disbursed through GoR TSA, against submission to the Bank of the IVA's PRVR on the achievement of DLIs. The IVA will submit the PRVR simultaneously to MINECOFIN and MININFRA within four weeks after each agreed verification period. MINECOFIN will submit to the Bank the IVA report within five weeks after the agreed verification period. The Bank will use the PRVR to determine the amount of the eligible disbursements and will notify MINECOFIN accordingly of the amount to be invoiced. MINECOFIN will therefore submit request for disbursement to the Bank.

3.3.2.3 **For DLI4-2: Prior result completion:** Disbursement will be effected upon loan effectiveness. The prior result is the approval of the ToR for the IVA by the Bank.

3.3.2.4 **Advance** will be disbursed upon loan effectiveness: Any advance will be deducted at the next payment. However, MINECOFIN can ask for an advance every year up to 25% of remaining loan amount except for the last year. Disbursement of advance and prior result shall not exceed 30% of the loan amount.

3.3.2.5 **For DLI1-1, DLI2-1, DLI2-2, DLI2-3, DLI3-1,** minimum and maximum values are defined:

- Minimum DLI (value/number/percentage) is the DLI level that needs to be reached to trigger the Bank disbursement. Payments will be made against an agreed amount to be disbursed for each milestone of DLI achieved on a pro-rata basis against progress up to the maximum DLI value.
- Maximum DLI value is the target agreed with the government for DLI to be achieved at the end of the program (see DLI matrix for details - *Annexure 2C*).

3.3.2.6 **For DLI1-2:** Disbursement will be effected against milestones for the SCADA DMS installation.

3.3.2.7 **For DLI4-1:** Capacity building and technical assistance, the achievement will also be assessed based on implementation of the agreed capacity building and TA plan. The amount to be disbursed will be calculated based on the number of people trained and the technical assistance provided.

3.4 EXPENDITURE FRAMEWORK ANALYSIS

3.4.1 Rwanda's implementation of Public Finance Management (PFM) reform has improved the quality of public service delivery. The GoR has a good track-record in implementing PFM reforms since 2008, including the newly approved Rwanda PFM Sector Strategic Plan (2018 -2024).

3.4.2 GoR capacity for formulating, executing and controlling credible annual budgets within a Medium-Term Expenditure Framework (MTEF) are in place and operating adequately. Over the past three years GoR expenditure budgets have been realistic, and GoR has produced a credible budget, underscoring budget discipline, and reflecting a strong link between budget formulation and execution as exemplified by the comparison of revenue estimates to actual outruns. This underscores the positive performance of the revenue authority. Rwanda is rated high in terms of budget predictability in year resources, reflecting fiscal discipline in budget formulation and execution. Over the past three budget cycles, (2015/16 to 2017/18), total expenditure variation over the period examined was less than 10% in one year (9.8% in 2015/2016; 12.1% in 2016/2017; and 10.9% in 2017/2018). There however remain areas for improvement including controlling budget overrun to fall below 5%, as well as further addressing expenditure arrears at central government level.

3.4.3 **Rwanda's budget classification system is comprehensive and consistent with international standards.** It is prepared in compliance with the IMF Government Financial Statistics System 2001 and International Public Sector Accounting Standards (IPAS). The IFMIS has also been successfully rolled out to cover 163 government entities and 216 Non Budget Agencies (NBAs) including schools and hospitals which significantly improved timeliness in the provision of quality PFM information. The GoR formulates, executes and controls its annual budgets within a Medium-Term Expenditure Framework (MTEF). The MTEF sets the main sectoral allocations and ensures that they are in line with policy targets. Coverage of government operations is noted as good in 2016 (PI-6) and the public have good access to fiscal information (PI-9), in accordance with generally accepted good practices.

3.4.4 **Rwanda has a very good track record of results-based management (RBM) which has been strengthened through the implementation of the various development strategies.** The 2016 Public Expenditure and Financial Accountability (PEFA) reports the PFM system produces a credible budget with a rigorous preparation process based on policy, including greater scrutiny of MDA budget

requests for compliance with priorities⁸. The RBM is operationalized at the ministerial, agency and staff levels, which creates a strong incentive mechanism to achieve results monitored through “*Imihigo*”. *Imihigo* Performance-based contracts are the GoR practice of planning and evaluation of goals, to accelerate service delivery across different levels. It is currently used as an effective tool for planning, implementation, performance evaluation and accountability for all public institutions. Each financial year, Ministries and Districts sign (*Imihigo*) with His Excellence the President of the Republic of Rwanda.

3.4.5 The 2018/19 budget approved in July (RWF 2, 443 billion) included grants (16.7%), loans (16.5%) and domestic finance (66.8%). Government plans to use 937 billion francs on development projects, a 44.4 % increase from the prior year’s capital expenditure budget. On average 5.9% of the approved budget is set aside for the energy sector over the next three years. In term of the energy sector’s budget, the execution rates of the energy sector program in the past three years were on average 91%. Total expenditure of the energy sector recurrent budget variation over the period examined was less than 9.1%.

3.4.6 **Funds flow of program expenditures.** (*See Section 4.3.2 below for details*).

3.4.7 **RBF and government program financing:** (*See Tables 2-2 and 2-3*).

4 KEY ASSESSMENT

4.1 TECHNICAL ASSESSMENT

4.1.1 **Strategic relevance:** The SEAP-II through its unique and direct contribution to the ESSP will significantly contribute towards the GoR’s efforts to boost economic growth while reducing inequality and poverty for Rwanda to become an upper middle-income country by 2035. The provision of adequate, reliable and affordable electricity services is a necessary ingredient to drive growth. While 36% of ESSP cost is allocated to increasing installed capacity with 15% generation margin, 26 % goes towards increasing access and improving reliability. Thus the SEAP-II seeks to support reliable supply of electric power and increase access making it strategically relevant and fully aligned with the government’s goals for the energy sector.

4.1.2 **Technical soundness**

4.1.2.1 **Technical capacity for MV and LV network:** The activities under the SEAP-II are technically straightforward, focus primarily on the core businesses of the REG and its subsidiaries, and cover distribution system upgrades, extension as well as expansion of electricity access through last mile connections. The budget execution for work planned at the EDCL is greater than 90%, which is an indication of the satisfactory implementation of planned distribution work. For the ongoing SEAP funded by the Bank, over 90% of the main project scope has been completed and plant energized on time and within the project planned timeframe, indicating a significant level of improvement in project delivery.

4.1.2.2 **Planning and design:** In the distribution segment, all network development and improvement activities are planned by the planning unit of EDCL. This unit utilizes the distribution planning software called DIG SILENT for T&D to model the network and to undertake load flow studies to provide performance characteristics such as network voltages and losses for development proposals under consideration. The unit uses the DICK MASTER PLS card, and PLS tower for line design. The software packages are used worldwide and provide an acceptable basis for identification and justification of the development projects. It has been however noted that only a limited number of engineers know how to use the software packages. The SEAP-II has included a capacity building program for engineers which will address this specific knowledge gap.

⁸ According to the 2016 PEFA, Individual sector strategy documents combined into EDPRS 2 cover over 80% of government expenditure.

4.1.2.3 **Operation and maintenance:** Furthermore, the REG has adequate technical and organizational capacity to operate and maintain its distribution assets. The REG has been able to maintain its distribution assets in an acceptable condition and under the proposed RBF program, REG will follow for all extension and upgrade works, technically proven concepts and practices building on the extensive lessons learned from completed projects funded either by the Bank or other donors.

4.1.2.4 **Overall technical assessment:** During appraisal, the Bank ascertained that REG has the experience and modern software to implement the SEAP-II. The REG has demonstrated in-house capacity for construction and supervision of electricity distribution networks. There has also been regular training provided by Bank staff in areas of E&S, procurement, Financial management and disbursement. Program implementation performance is on average satisfactory. However, the complexity of the SEAP-II calls for the provision of additional expertise particularly in distribution system design and development/ procurement distribution system project management/M&E, and in distribution system operational performance.

4.1.2.5 **Results framework:** The proposed RBF results framework identifies DLIs to strike a balance between incentives to achieve the key outputs and outcomes as shown in *Annexure 2B*.

4.2 PROGRAM ECONOMIC AND FINANCIAL EVALUATION

4.2.1 The SEAP-II activities are intended to impact the sector across the country and lead to financial gains to the utilities. Financial benefits and associated costs have been identified and consistently projected to align with both the social economic and macroeconomic fundamentals of Rwanda. Rwanda energy sector publications, project related technical feasibility studies as well as information collected via interview discussions have been used to develop the assumptions used in the analysis.

4.2.2 **The financial evaluation** result indicates a positive Net Present value (NPV) of US\$180M using a real discount rate of 6.0%. The 6.0% should approximate the Weighted Average Cost of Capital (WACC) for the REG and a program such as this one given the huge amount of subsidized financing provided to the power sector in Rwanda. The Financial Internal Rate of Return is 9.2 % in real terms and is more than the weighted average cost of capital for REG. This result is consistent with the fact that Rwanda has a higher energy cost compared to the tariff that is always subsidized to meet the operating costs of the energy sector in the country⁹.

4.2.3 **An integrated approach that develops the economic analysis from the financial analysis was employed to build an economic resource flow statement.** The economic benefits were calculated using the willingness to pay and considers the affordability of the consumer. Estimated benefits include environmental benefits arising from application of off-grid SHSs. On the resource outflow side, conversion factors were applied on the financial calculations to calculate the associated program resource costs.

4.2.4 The result shows the SEAP-II is economically viable from a country perspective with an Economic Net Present Value (ENPV) of US\$171M, indicating that the program presents a better alternative use of Rwanda's resources. Compared to the Economic Discount Rate of 12%, the Economic Internal Rate of Return (EIRR) at 17.6% real, is higher.

⁹ Rwanda's electricity supply is expensive due to limited domestic energy resources and use of expensive IPP to meet the demand. The cost of supply averaged US\$0.32 per kWh in FY2015/16. Tariffs—at an average of US\$0.20 per kWh, among the highest in the region—are below cost recovery because low incomes limit consumers' ability to pay for electricity services. The gap of US\$0.12 per kWh is covered by budget transfers to REG (US\$57M in total in FY2015/16, net of taxes)

Table 4-1: Summary of Results from the Economic and Financial Analysis

Indicator	Financial	Economic
FNPV @ 6% real discount rate	US\$180M	NA
FIRR, real	9.2%	
ENPV @ 12% real discount rate	NA	US\$171.2M
EIRR, real	NA	17.6%

4.2.5 **Sensitivity Test:** The sensitivity test on tariff, the WTP, the cost of energy and cost overrun on investment costs, reveals that the cost of energy presents a significant impact on the viability of the program, especially from the financial perspective. This is because of the low energy resources in Rwanda that make energy expensive. This implies that lower and efficient energy investments can prove viable to achieve access, as already articulated in the energy strategy of Rwanda.

4.2.6 **Financial Status of the EDCL and EUCL.** The analysis revealed that EDCL as a project development and implementation company has revenues that largely consist of cash grants from the GoR (90%) and direct donor funding (10%). Most of its assets are represented by construction work in progress projects. EUCL as a utility gets its revenues from sales of electricity. Its main cost is the cost of electricity, which is also highly subsidized by the GoR. The assets of the company are largely transmission and distribution assets while generating assets in the country are under the government. From the risk perspective, both EDCL and EUCL activities expose them to a variety of financial risks: market risk (including foreign exchange risk and interest rate risk), credit risk and liquidity risk. GoR has been providing subsidies to meet the operating costs of the companies which will be reduced as the companies efficiencies improves.

4.2.7 **Conclusion:** The incremental impact of the SEAP-II results in a positive NPV (US\$180M @ 6% real discount rate) and an IRR of 9.2%, higher than the assumed cost of capital to REG. This clearly indicates that on a standalone basis, the proposed investment program creates wealth for the utilities. However, the cost of energy remains higher and may adversely impact the sustainability of the access program in Rwanda.

Given that Rwanda is yet to implement its least cost plan for generating electricity and also given the higher energy poverty in the country, the economic impact (measured by the ENPV of USD 171 million at 12% discount rate and EIRR of 17%, more than 12%) of such a project is high, indicating that the resources of the country have been better employed by investing them into this project as compared to other alternative uses.

4.3 FIDUCIARY

4.3.1 Fiduciary:

4.3.1.1 **Satisfactory Fiduciary Risk Assessment:** The overall assessment of Rwanda’s PFM system is adequate to implement the program as enforced by the 2013 Organic Law on State Finances and Property N° 12/2013/OL of 12/09/2013 – principles and modalities for State Finances and Property; Ministerial Order No 001/16/10/TC of 26/01/2016 – structure and functioning of PFM; and Article 165 and 166 of Rwanda Revised Constitution and Law No. 79/2013 of 11/09/2013 – Auditor General. The overall fiduciary risk covering procurement, financial management and governance is deemed moderate.

4.3.2 Financial Management (FM)

4.3.2.1 The FM assessment of the operation concludes that the FM systems pertaining to the program are acceptable to implement the SEAP-II and provide reasonable assurance that the proceeds of the funds will be used for their intended purpose in an economical, efficient, effective, accountable, and transparent manner. The adverse audit opinions for REG/EDCL/EUCL coupled with the lack of consolidation of financial data at REG level constitute important weaknesses.

The key to their resolution is the recruitment of key qualified financial accounting staff. Noting that the identified FM weaknesses, if timely addressed, do not prevent the attainment of the program development objectives.

4.3.2.2 Proposed risk mitigation measures have been identified in the Program Action Plan to address specific areas in the process / system for improvement. These measures will enhance both the systems and human capacity, as well as improve program/systems' performance (e.g. including DLI monitoring into the work program of the Internal Auditor).

4.3.2.3 **Disbursement/Flow of Funds /Verification:** SEAP-II resources will be deposited in the GoR TSA at the Central Bank (Banque Nationale du Rwanda – BNR), utilizing the normal budget process and flowing through GoR Treasury system to both the implementing agencies (REG- EDCL and EUCL) and the IVA. The disbursement of the program proceeds will be contingent upon achievement of the agreed DLIs as verified by the IVA and the final decision on achievement of DLIs by the Bank.

4.3.2.4 **Program Financial Audits:** The program's financial audits, for the systems and entities in charge of the implementation will fall under the purview of the Office of the OAG under its statutory mandate and in line with the use of existing country systems being implemented in Rwanda.

4.3.3 Procurement

4.3.3.1 Procurement of goods, works and services financed by the Bank under this program will be undertaken in accordance with the Borrower's Procurement System (BPS), relying on the country's own oversight institutions (internal controls, audit, fraud and corruption, etc.). This is in line with the Bank's policy on RBF. The assessment of the national procurement system concludes that Rwanda's procurement legal and regulatory framework are laid on the fundamental procurement principles of economy, efficiency, transparency and equity. The overall perceived risk in public procurement is moderate, since robust procurement system and sound oversight and accountability systems are in place to enable the country to achieve value for money and make use of public funds in an effective and transparent manner.

4.3.3.2 The assessment of procurement risks at the country, sector and program levels and of procurement capacity at the Implementing Agencies (IA) level reveals moderate risk. However, capacity-building support for technical design, negotiations and contracts management is needed to ensure smooth and timely delivery of procurement activities. It is also recommended that the IAs start the preparation of procurement documents and launch all required tenders immediately to allow an early start of the procurement process of the program prior to the approval of the program by Bank with the objective of expediting the implementation of procurement activities. A program action plan is presented in *Annexure 7A*.

4.3.3.3 Waiver of Rule of Origin: Pursuant to the Waiver of Rule of Origin for Specific Cases Document ADB/BD/WP/2016/184/Rev.2 , the ADB rule of origin is waived because the Program is jointly co-financed by the ADB and ADF

4.3.4 Governance

4.3.4.1 Rwanda's public sector reforms over the past 24 years has led to remarkable progress in rebuilding core public sector institutions, which has led to improved governance and established the rule of law as key pillars in successive development strategies in post genocide environment. Over the passage of these years, Rwanda has passed a wide range of reforms that have been implemented to increase citizen participation in governance including the adaptation of a new Constitution in 2003, which restored multi-party democracy and outlawed all forms of discrimination including ethnic discrimination in political activities.

4.3.4.2 **Rwanda's legal, regulatory and institutional framework facilitates accountability in decision-making.** The country has a zero tolerance policy to corruption supported by robust anti-corruption laws and strong institutions to enforce accountability, such as the Ombudsman office, OAG, Public Accounts Committee (PAC) of Parliament, and the national police. These institutions enjoy

strong support from the country's top leadership. The country's ranking on Transparency International's Corruption Perception Index improved from 49 out of 177 countries in 2014 to 44 out of 168 countries in 2015 but fell in 2017 to 48, which makes Rwanda the fourth in Sub-Saharan Africa and the least corrupt in the EAC region. Rwanda's overall ranking in the Mo Ibrahim Index of African Governance (IIAG) has improved from 23rd in 2011 to 11th in 2014 and ninth in 2017, with a score higher than the EAC (44.3) and continental (50.1) averages.

4.4 CLIMATE, ENVIRONMENTAL AND SOCIAL IMPACTS

4.4.1 The proposed SEAP-II activities under Result Areas 1, 2 and 3 (construction and/or upgrading of LV and MV distribution lines, upgrading of substations and re-conducting of 110 kV transmission lines) could generate moderate to low environmental and social (E&S) impacts, likely to be localized and limited in scope. The program has therefore been categorized as 2, which was validated on 29 June 2018.

4.4.2 As per the RBF Policy, a limited Strategic Environmental Social Assessment (SESA) incorporating a Country Environmental Systems Assessment (CESA) and a robust program-specific Environmental and Social Management Plan (ESMP) have been prepared to mitigate the identified residual impacts. The SESA contains an assessment of the country systems. A management plan is made to address the identified gaps in order to comply with both the country and the Bank's Integrated Safeguard System (ISS).

4.4.3 **Environmental Impacts:** Increasing electricity access via construction of the LV, MV and re-conducting of HV lines will result in low to moderate construction-related impact such as clearance of vegetation, dust and air quality, noise, waste generation, pollution to soil and water resources, changes to visual landscape and general occupational health and safety impacts to workers and the affected communities. Lines following roads adjacent to conservation areas will accommodate wildlife movement in their design, mitigate visual landscape intrusion and avoid unnecessary tree cutting or displacement of people. Off-grid access through the proposed SHSs could lead to the generation of moderate to high impact from waste. The waste streams includes packaging waste and hazardous wastes following end of life of the solar panels.

4.4.4 Solar energy is clean and renewable and will result in positive impacts to the beneficiary communities who currently rely on polluting sources of energy, such as kerosene and candles.

4.4.5 **Social Impacts:** Access to reliable electricity will enable more efficient management of goods and services, and better means for processing and storage. Potential beneficiary enterprises affected by and contributing to regional socioeconomic transformation will be small industries such as sawmills and ginneries, grain mills and other agricultural processing and storage facilities.

4.4.5.1 Improved and increased electricity supply will contribute to ease of living. There will be a better supply of pumped water for domestic and other purposes. Communities and individuals will have data management capabilities with computers along with communication facilities such as the Internet and mobile phones. Electric lighting adds to security at night and enables extended opportunities for work and study. Therefore, the quality of life and extent of economic opportunity will be transformed. Social and environmental costs, not least in noise and air pollution associated with existing generator usage, will be reduced with requirement for the cutting and collection of firewood becoming less.

4.4.5.2 However, the minor construction activities associated with the LV and MV works could lead to low to moderate impacts on affected communities. Migrant workers may have an impact on community and occupational health and safety, and there might be an increase in HIV infections, gender-based violence and a subsequent pressure on existing community-based infrastructure such as hospitals.

4.4.5.3 **Gender mainstreaming:** This project has been categorized as Category 3 per the Gender Marker System. The 2010 National Gender Policy promotes gender equality and MININFRA developed the Infrastructure Gender Mainstreaming Strategy in 2017. Under the SEAP II, gender-differentiated considerations will be mainstreamed as part of the utility operations and increased access to electricity.

Women, girls and children will disproportionately benefit from these provisions as well. Electricity in the health facilities and clinics translate to better hygiene, safer deliveries, and better care of sick children. In schools, it makes it possible for children to have access to computers or other devices that will not work without electricity. Women and girls are the primary fetchers of water and firewood. Electric pumps will make their daily tasks less strenuous; moreover, it allows for access to more water, improving the general health of the family. The cumulative impacts will result in the overall socio-economic wellbeing of the children, women and female-headed households. There is no readily available information to estimate the exact number of female-headed HHs (FHHs) currently connected to estimate the additional number of FHHs that will be connected under the SEAP-II., as available data on household connections are usually registered in the name of the family head usually the man. However, it is estimated that 52% of women will have access to electricity under the SEAP II. It will ensure results are disaggregated where relevant and capacity development activities target at least 30% female and male staff. The project will also dedicate resources for the development of gender mainstreaming program, guidelines and action plan to strengthen procedures within REG to promote equitable access allocation of benefits and impacts of rural electrification (*see Annexure 6*).

4.4.5.4 Based on the above positive social impact of SEAP-II, in particular; social inclusion, poverty alleviation; improving access to disadvantaged areas of society through the implementation of SHS, the GoR has opted to on-grant rather than on lend the loan to EDCL. In addition, the program (as noted in section 1.4.2) will also contribute towards the country's socio economic transformation and inclusive growth.

4.4.6 Country Systems Assessment :

4.4.6.1 **Grievance redress:** Communities and individuals who believe that they have been and/or are adversely affected because of the SEAP-II may submit complaints to the existing program Grievance Redress Mechanism (GRM). REG manages the GRM, which includes provisions for Interested and Affected Persons (IAPs) to seek redress through a staged managed process.

4.4.6.2 However, if all the opportunities to seek redress by IAPs through the GRM have been exhausted with no reasonable solution, they can contact the Bank's Independent Review Mechanism (IRM)'s Grievance Redress Service. Complaints to the Bank's IRM, can be done through <https://www.afdb.org/en/independent-review-mechanism/management-of-complaints/how-to-file-a-complaint/>.

4.5 CLIMATE CHANGE AND GREEN GROWTH

4.5.1 Rwanda's economic and social development ambitions are directly linked to its long-term resilience to climate change and following a green growth development pathway. The National Strategy for Climate Change and Low Carbon Development seeks to meet development goals while reducing the country's vulnerability through mitigation and adaptation actions. From the country's nationally determined contributions under the Paris Agreement, energy (including its accessibility, affordability and efficiency) is central to most mitigation and adaptation actions in Rwanda.

4.5.2 Several activities have direct climate benefits. First, the SHSs will ultimately reduce the dependence on fossil fuels, and reduce GHG emissions. Second, the efficient pricing of electricity is expected to contribute to reduction of GHGs due to anticipated demand response. Third, expanding connections to households in underserved regions support their adaptation/resilience goals to climate risks as well as would reduce dependence on forest biomass (source of basic energy for local populations). Ultimately, it will reduce forest degradation and emissions as part of climate mitigation. Finally, low carbon energy mix and improving the power system reliability as well as maximizing efficiencies in generation and distribution systems would lead to rural electrification, which will foster increased economic activities and job creation.

4.6 INTEGRATED RISK ASSESSMENT

Table 4-1 : Integrated Risk Assessment summary

Integrated Risk Assessment summary	
Risk	Moderate
Technical	Moderate
Fiduciary	Moderate
Climate, Environmental and Social	Moderate
Disbursement-linked Indicators	Moderate
Other Risk	Moderate

4.6.1 The overall risk rating of the SEAP-II is moderate, and key management measures are proposed. The key identified risks and related management measures are detailed in *Annexure 7*.

4.7 PROGRAM ACTION PLAN

4.7.1 The three assessments under the SEAP-II have identified many potential improvements that could be carried out to enhance the development effectiveness of REG and its subsidiaries' distribution expenditure, including technical, procurement and financial management as well environmental and social. The Bank and REG have agreed on measures to improve program management (see *Annexure 7A* for detailed action plan).

4.8 LEGAL INSTRUMENTS AND AUTHORITY

4.8.1 Legal Instrument

The legal documents for SEAP-II include the following: (i) Two **Loan Agreements**: A Loan Agreement to be executed between the ADB and the Borrower as well as a Loan Agreement to be executed between the ADF and the Borrower. (ii) **Subsidiary Agreements**: A Subsidiary agreement each to be executed, between the Borrower and REG, the Borrower and EDCL, the Borrower and EUCL on-granting the proceeds of the ADB and ADF loans on terms and conditions acceptable to the Bank and (iii) Six **Program Agreements**: Comprising a Program agreement each between ADB and REG, EDCL and EUCL respectively; and a Program Agreement between ADB and REG, EDCL; EUCL respectively on the implementation of the program.

4.8.2 Conditions associated with the Bank's proposed Financing

4.8.2.1 **Entry into Force Conditions**: The conditions precedent to the entry into force of the loan agreements will be in accordance with (i) Section 12.01 of the General Conditions Applicable to African Development Bank Loan Agreements and Guarantee Agreements (Sovereign Entities) and (ii) Section 12.01 of the General Conditions Applicable to African Development Fund Loan Agreements and Guarantee Agreements (Sovereign Entities)

4.8.2.2 **Conditions Precedent to first disbursement**: The obligations of the Bank and Fund to make first disbursement under the ADB and ADF Loan Agreements respectively shall be conditional upon entry into force of the Loan Agreements, and the satisfaction of the following conditions by the Borrower. (i) the execution and delivery of Subsidiary Agreement between the Borrower and EDCL in form and substance satisfactory to the Bank and the Fund; (ii) submission of evidence that the Subsidiary Agreements have been duly authorized by the Borrower and EDCL in accordance with the agreed terms; (iii) the execution and delivery of Program Agreements amongst the Bank and the Fund and each of REG, EDCL and EUCL in form and substance satisfactory to the Bank and the Fund; (iv) submission of evidence satisfactory to the Bank and the Fund that the said DLI has been achieved, including a PRVR from the IVA, in accordance with the Verification Protocol and procedures and arrangements satisfactory to the Bank and the Fund; (v) for purpose of prior result financing, the Bank/ the Fund's approval of the ToR for the appointment of the OAG as the IVA

4.8.2.3 **Advance Financing** is authorized under Sections 2.3.4 and 3.3.2.4 of the PAR. Details of the Advance financing shall be enunciated in the Loan agreements and will only be made upon effectiveness of the respective Loan Agreements

4.8.2.4 **Prior Result Financing:** Disbursement may be made up to an aggregate amount not to exceed UA1.08M for the prior result on the approval by the Bank of the ToR for the appointment of the OAG as the IVA. Details shall be captured in a special clause in the respective Loan Agreements.

4.8.2.5 **Condition Precedent to Subsequent Disbursements.** The obligations of the Fund/ Bank to make subsequent disbursements of the Loan shall be subject to the submission of evidence satisfactory to the Fund that the said DLI has been achieved, including a PRVR from the IVA, in accordance with the Verification Protocol and procedures and arrangements satisfactory to the Fund

4.8.3 **Compliance with the Bank's Policies:** This program complies with all applicable Bank Group policies and guidelines.

5 RECOMMENDATIONS

Management recommends that the Boards of Directors approve the proposed (i) ADF loan of UA53M and (ii) ADB Loan of EUR165.59M to the GoR for financing of the SEAP-II subject to the terms and conditions stipulated in this report.

APPENDIX 1: PROGRAM RESULTS CHAIN AND DISBURSEMENT-LINKED INDICATORS.

<i>Results Areas</i>	<i>Activities</i>	<i>Intermediate Indicators/Outputs</i>	<i>Outcomes</i>
Results Area 1 : Increased power system reliability	Upgrade of 30/15kv line Recon ducting of 110kv distribution line Upgrade of transformers Construction and or connection of MV feeders Rebalancing of feeders load Preparation of tender document, Procurement, installation and operationalization of SCADA/DMS	Number of transformers of 5 kVA and above upgraded Additional feeders constructed.. Reduction in SAIDI and SAIFI	Reduction in SAIFI Improved SAIDI for 30/15 kV(DLI1-1) SCADA/DMS installed and operationalized (DLI1-2)
Results Area 2: Increase on-grid access for household and productive-use customers	Construction of MV lines Construction of LV lines,installation of distribution transformers Service drops, including meters, and ready-boards Procurement of pre-paid meters Connection of residential customers Connection of productive usage customers.	Increase of sales in kWh and in RWf Additional length of KM of MV line constructed and/or upgraded (DLI2-3). Additional length of LV line constructed	Number of household customers connected to the grid of which 52 % are women (DLI2-1). Number of productive-use connected to the grid (DLI 2-2)
Results Area 3: Increase off-grid access to renewable energy	Preparation of SHS implementation plan Preparation of tender document Installation of stand-alone solar systems	Cumulative number of people provided with off-grid solar home systems	Number of new household customers provided with solar home system of which 52% are women (DLI3-1)
Results Area 4: Institutional Strengthening and Capacity Building	Preparation of ToR for the IVA Preparation of ToR for technical assistance experts Preparation of ToR gender policy and performance management framework. Procurement of firm to undertake the studies under the program Prepare bidding document for supply of safety tools and protective equipment Design and implement capacity building and process improvement programs National electrification plan completed and approved Energy sector strategy plan completed and approved	Implementation of national electrification plan Implementation of productive-use connection plan, with regular review of impact and sustainability Cumulative number of staff in REG, EDCL and EUCL receiving technical training on energy planning, rural electrification, construction and supervision of power infrastructure, O&M, loss reduction, standards, network protection, power system efficiency and project management (included in DLI4-1). Cumulative number of staff in REG, EDCL and EUCL receiving fiduciary training on audit/compliance and procurement (included in DLI4-1) Cumulative number of staff in REG, EDCL and receiving E&S training including environmental protection, gender mainstreaming and health and safety (included in DLI4-1) Finalize study on performance management framework, gender policy (included in DLI4-1)	Increase efficiency in program implementation Sector capacity and institutions strengthened: Improved cost-effectiveness of Program Improved skill development Timely program implementation Timely results verification

APPENDIX 2: LESSONS LEARNED AND SEAP-II ACTIVITIES

Table AP1-1: Lessons learned from SEAP-I

	Investment Lending (SEAP I)	Results Based Financing (SEAP II)
Quality at entry	Project Appraisal starts with detailed feasibility study from the Executing Agency, including detailed E&S and RAP for Category 1 projects. Estimates at project approval turned out to be significantly higher than actuals. Project extension of disbursement was necessary to utilize the resulting savings on loan and grant. Technical dialogue with the Government is not as detailed as in the RBF.	RBF policy requires very detailed upfront technical dialogue with the government to facilitate assessment activity and outputs, and provide better estimation of the program cost than is usually the case for Investment lending. The overall program is itself validated by both Ministry of Infrastructure and Ministry of Finance and Economic Planning
Project design	SEAP I required use of a supervision consultant to prepare bidding documents and support the EA to supervise delivery of the project..	As the SEAP II is part of a larger government program, in-house capacity will be used for preparation of bidding documents and supervision of the entire program. REG will provide the day-to-day supervision while the MINIFRA and MINECOFIN will provide oversight for the entire program from which SEAP II is carved, and therefore ensuring closer government scrutiny and ownership.
Procurement	Use of Bank procurement procedures required frequent to and fro communication at several stages between the executing agency and the Bank, for example to clear the expression of interest, request for proposal, tender documents, bid-evaluation reports, negotiated contracts, etc. This clearing and validation process takes up a significant amount of time and has led to project implementation delays.	The RBF requires use of country systems for procurement, significantly reducing project-implementation time. The Bank has reviewed the use of the country system and concluded it is acceptable for anticipated procurement under SEAP II
Implementation capacity	Implementation of SEAP I is supported by consultancy services who also double up as mentors for the REG staff. However, there are several investment lending projects as well as RBF-type operations by other financiers that use the REG's in-house capacity.	The REG has experience, capacity and skills to implement of MV and LV power distribution networks. These don't need consultancy supervision. However, because of the magnitude of this operation, some capacity building and technical assistance is proposed to enhance implementation performance and quality assurance.
Cost efficiency	The average cost per new electricity connection under the SEAP I is estimated at USD 1,400 with use of foreign construction companies and consulting firms.	SEAP II will use in-house capacity supported by a few technical experts and local contractors to deliver the program with greater value for money, and with significant savings on time to

		completion.
Cost of Bank supervision	Very intensive implementation supervision is necessary, as this is focused on the project implementation process and inputs. The process is characterized by numerous requests for 'no objections' besides the programmed supervision missions..	Government is in charge of the implementation, processing and supervision as part of its bigger program. The Bank will focus on achievement of agreed results under the SEAP II. As a first RBF operation for the Bank, quarterly desk review in addition to semi-annual field missions are planned to enhance learning..
Knowledge capture and retention	With the consultants preparing and supervising implementation of the project, REG staff assigned to the project do not have the opportunity to exercise their technical skills and take decisions.	With SEAP II REG staff from all key departments have been involved in the program definition at appraisal, and will be in charge of the construction design, procurement and delivery logistics of materials, supervision and commissioning of the installed distribution system equipment. This provides an excellent opportunity to build technical skills at all levels of the program.

Table AP1-2-Results Area 1 activities

	Results Area 1 : Increased power system reliability	64,300,352 28.05%	Type	Location	Implementer
A1-1	Upgrade of Musha Substation	Network reinforcement & strengthening in East province: Build a new feeder from Nyabarongo I substation and Load transfer from Gatumba and Ngororero Feeders to the new feeders from Nyabarongo	1 feeder added (4 km, 30 kV double circuit,)	Eastern province in Rwamagana district	EDCL, Generation and Transmission department
A1-2	Upgrade of Camp Belge substation	Network Reeinforcement & strengthening by upgrading Camp Belge Ss	1 Transformer added	Northern province in Musanze district	EDCL, Generation and Transmission department
A1-3	Reconducting of 9 km the last section (35mm ²) of Ngororero T-Off with 120mm ² .	Upgrade conductor capacity	Upgrade of 30 kV line	West province in Ngororero District	EDCL (EARP)
A1-4	Reconducting Byumba – Kageyo line (35mm ²) with 120mm ²	Upgrade conductor capacity	Upgrade of 30 kV line	Northern province in Gicumbi district	EDCL (EARP)
A1-5	Reconducting Musasa main feeder with 120mm ²	Upgrade conductor capacity	Upgrade of 30 kV line	Northern province in Rulindo district	EDCL (EARP)
A1-6	Feeder interconnection between Ntendezi & Mururu 1	Construction of line to connect two feeders Mururu and Ntendezi	Linkage of two feeders	Western province in Rusizi district	EDCL (EARP)
A1-7	Feeder interconnection between Kibogora & Karongi	Construction of line to connect two feeders Kilinda and Karongi	Linkage of two feeders	Western province in Nyamashoke /Karongi districts	EDCL (EARP)
A1-8	Feeder interconnection between Kilinda & Kigoma	Construction of line to connect two feeders Karongi and Kigoma	Linkage of two feeders	Karongi/Ruhango	EDCL (EARP)
A1-9	Upgrade of STEG Network	Upgrade of single phase to two phase	Upgrade of 30 kV line	Rwamagana/Kayonza/Ngom a/Kirehe/Gatsibo/Nyagatare	EDCL (EARP)
A1-10	UTEXRWA (load transfer to DW)	Load transfer by constructing a line to connect two feeders	Linkage of two feeders	Kigali city province in Gasabo district	EDCL (EARP)
A1-11	Gikondo to Ministere feeders (underground 2x240mm ²)	New cable supply from Gikondo to Kigali City	Upgrade of 30 kV line	Kigali city province in Kicukiro/Gasabo districts	EDCL (EARP)
A1-12	Mont Kigali to Kigali south 120/20 ACSR	new supply line from mont Kigali to Kigali south	Upgrade of 30 kV line	Kigali City province in Nyarugenge district	EDCL (EARP)
A1-13	Re-conduct the part of Kanazi Feeder from Nyamata to Nemba 70mm ² with 120mm ²	Upgrade of conductor capacity	Upgrade of 30 kV line	Eastern province in Bugesera district	EDCL (EARP)
A1-14	30kV Airport to Nyamata (Back up line)	Construction 30 kV line for back up purpose	Back up Line	Eastern province in Bugesera	EDCL (EARP)
A1-15	Reconducting the existing 70mm ² conductor for	upgrade conductor size (North Province)	13 km reconducted	Northern province in Musanze	EDCL (EARP)
A1-16	Reduce stress on Kigali (Jabana) short term solution	To connect a part of kigali network to Base feeder coming from Rulindo SS .	1.7 km of MV to be constructed	Kigali	EDCL (EARP)
A1-17	Interconnection of Byumba Feeder with Shango	7km of 30kV interconnecting Byumba feeder to Shango SS to increase liability	7 km of MV will be constructed	Northern province in Gicumbi	EDCL (EARP)
A1-18	Nyabarongo 110/30kV 20MVA Substation and	Upgrade existing 1 MVA Nyabarongo substation to 20 MVA and construct 8.5km 30kv feeder to connect Gatumba and Ngororero. Nyabarongo SS is close to 28MW hydro power station constructed in 2014	New substation will be constructed with 8.5 km of new feeder to be constructed	Southern province in Muhanga	EDCL, Generation and Transmission department
A1-19	Construction of a 15kV Double circuit line to supply	3.4km distribution network to connect Rwamagana industrial park. The SS is close to nyabarongo 1 , 28MW hydro power plant	3.4 km of distribution line to be constructed	East province in Rwamagana	EARP
A1-20	Kirinda Transformer	Upgrade of 1.6 MA to 6 MVA for better liability	6 MVA transformer will be installed	Western province in Karongi	EDCL, Generation and Transmission department
A1-21	Upgrade of Gahanga- Gikondo distribution line	Upgrade 7.2 km of Gahanga feeder (OHL-15kV) to 120/20mm ² for better supply	7.2 km to be constructed	Kigali	EARP
A1-22	Mukungwa to Ngororero 30kV distribution line	Construct a new 34 km ,30kV distribution line and a Switching station at Mukungwa II	34 km of line constructed. And one switching station constructed	Northern province in gakenke	EDCL, Generation and Transmission department
A1-23	Nasho 30kV distribution: Kabarondo substation	Construct a new 30km double circuit 30kV line from kabarondo to Nasho. This include a step down transformer with feeder base	30 km of line constructed	Eastern province in Kayonza	EARP
A1-24	Repacement of transformer wiring	Replacement of Karongi YY transformer causing MV harmonics in HV line with DY transformer 20MVA	20MVA TX wiring changed from YY to DY	Western province in Karongi	EDCL, Generation and Transmission department
A1-25	Split Bussbar	Split 15kV busbar in Kigali North and Kigali south cabins for more flexibility of supply to the city		Kigali province in Nyarugenge	EARP
A1-26	Interconnect Byumba feeder with Gabiro Substation	Construction of 9.5km 30kV 120/20mm line to connect Gabiro substation to the long Byumba feeder and reduce the length of Byumba feeder.	9.6km 30kV line	Gatsibo	EARP
A1-27	Reconducting of 160 km of 110 kV line	Reconducting of 160 km of 110 kV line from Mukungwa to Rwinkwavu. Replace from 150mm to 240 mm	160 km of 110kV line reconducted	country wide	EDCL, Generation and Transmission department
A1-28	Distribution Management System (DMS)	To improve visibility and remote control in the distribution network	DMS installed	Countrywide	EDCL, Generation and Transmission department

Table AP1-3: Results Area 2 Activities

	Results Area 2: Increase access to on-grid electricity for household and for productive usage	150,084,471	Type	Location	Implementer
		65.65%			
A2-1	Investment in Kicukiro, Nyarugenge, Gasabo,) that will allow household connection of 51,254 household, 55km of MV line, 2127,13Km of LV, and 115 Transformers	Kigali city 100% Access Program	Access Program	Kigaly province in Nyarugenge/Kicukiro/Gasabo districts	EDCL (EARP)
A2-2	KKK Feeder extension to Gabiro switching station	extension of MV line to increase access in the area and increase REG revenue	Extension of MV Line	Eastern province in Kayonza, Ngoma and Gabiro districts	EDCL (EARP)
A2-3	30kV Single circuit Nyagasozzi-Kavumu	Extension of 36km Power Supply to Nyagasozzi and Kavumu Cells in Musanze District	36 km Additional MV line constructed	Northern province in Musanze district	EDCL (EARP)
A2-4	30kV Double Circuit line Bugerera to Airport	Extension of 8 km Power Supply to Bugesera Airport	8 km of MV Line constructed	Eastern province in Bugesera district	EDCL (EARP)
A2-5	Investment for productive usage	Connect 2112 productive usage customers	Productive Usage	Countrywide	EDCL (EARP)
A2-6	30kV Double circuit line	Extension of 9.3 km of MV Power Supply to Gako beef	Additional 9.3 km of MV and 10 km of LV lines constructed	Eastern province in Bugesera district	EDCL (EARP)
A2-7	30kV Double circuit line (From Gabiro Ss to Gabiro Commercial Farm)	new 30kV 43 km distribution line to Gabiro Commercial Farm	Additional MV line constructed	eastern province in Gatsibo district	EDCL (EARP)
A2-8	140,000 Pre-paid meters, poles, cables and other accessories needed for connecting HHs	140,000 House holds will be connected to the Grid (Fill	construction of 5,180 km of LV will be constructed	Countrywide	EDCL (EARP)

Table AP1-4: Results Area 3 Activities

	Results Area 3: Increase access to off-grid electricity	8,700,514	Type	Location	Implementer
		3.80%			
A3-1	install solar off-grid system	The project will connect Off Grid area in souther and wertern regions	Unit installed	Countrywide	EDCL

Table AP1-5: Results Area 4

	Action Description	Description	DLI (Yes/No)	FY 2018/19 baseline	FY 2018/19 target	FY 2019/20 target	FY 2020/21 target	Average cost in EUR	Total cost in EUR	Date Due	Responsible party	Completion Measurement
	1-Technical											
T1-1	Energy Planning	Forecasting, feasibility studies, investments	Yes included in DLI4-1	21	20	45	35	689.66	68,965.52	During implementation	REG	Evaluation at end and certificate given
T1-2	Rural electrification	feasibility, BOQs, environmental & social impact, line construction	Yes included in DLI4-1	55	344	130	130	431.03	260,344.83	During implementation	REG	Evaluation at end and certificate given
T1-3	Construction & supervision of power infrastructure	BOQs, Designs & Maps, standards	yes included in DLI4-1	24	10	60	40	689.66	75,862.07	During implementation	REG	Evaluation at end and certificate given
T1-4	Testing & Commissioning of power infrastructure	BOQs, Designs & Maps, standards, Testing and commissioning procedures	yes included in DLI4-1	17	15	30	30	4310.34	323,275.86	During implementation	REG	Evaluation at end and certificate given
T1-5	Operation & Maintenance of power Infrastructure	Operating parameters Testing skills Troubleshooting skills, system sustainability	yes included in DLI4-1	97	150	225	225	431.03	258,620.69	During implementation	REG	Evaluation at end and certificate given
T1-6	Loss Reduction	Meter programming, calibration, and maintenance, recovery programmes, revenue protection	yes included in DLI4-1	78	120	170	170	689.66	317,241.38	During implementation	REG	Evaluation at end and certificate given
T1-7	Standards	Power infrastructure and equipment standards, Quality assurance	yes included in DLI4-1	11	7	15	15	4310.34	159,482.76	During implementation	REG	Evaluation at end and certificate given
T1-8	Network Protection	Advanced testing methods of protection relays, Faults analysis and mitigation, setting calculations, Knowledge of international standards IEC, IEEE, ANSI, and local standards	yes included in DLI4-1	6	2	6	6	6896.55	96,551.72	During implementation	REG	Evaluation at end and certificate given
T1-9	Power System Efficiency	Network audits,	yes included in DLI4-1	20	20	55	45	689.66	82,758.62	During implementation	REG	Evaluation at end and certificate given
T1-10	Project Management	Project appraisal, project finance, Contract Management, M&E, Reporting, Structuring PPPs	yes included in DLI4-1	17	20	20	20	2586.21	155,172.41	During implementation	REG	Evaluation at end and certificate given
T1-12	Technical Assistance: Procurement of 4 experts	Distribution system operational performance expert to strengthen IVA capacity, Project Management expert/monitoring and evaluation expert, Distribution system design and development expert/procurement, one more	yes included in DLI4-1		4	4	4	86206.9	1,034,482.76	By September 2018	REG/E DC?/E UCL	recruitment of expert under yearly Performance contract signature with expert. ToR cleared by AfDB
T1-13	Performance Management Framework	Study	yes included in DLI4-1	19	150000	N/A	N/A	N/A	129,310.34	By November 2019	REG	Study report approved by board of director
T1-14	Safety tools & Personal protective equipments	tools, equipments	yes included in DLI4-1		1141454	N/A	N/A	N/A	984,011.67	By November 2019	REG	procurement and installation completion of equipment
	Total cost for technical			365	1,835,350	877,125	852,393		3,564,868			

	Action Description	Description	DLI (Yes/No)		FY 2018/19 target	FY 2019/20 target	FY 2020/21 target	Average cost in EUR	Total cost in EUR	Date Due	Responsible party	Completion Measurement
2-Fiduciary												
T2-2	Audit & compliance	IFRS standards, risk mitigation, Corporate governance	yes included in DLI4-1	3	11	12	12	2586.21	90,517.24	During implementation	REG	Evaluation at end and certificate given
T2-3	Procurement	Procurement guidelines of development partners, Contract drafting, Negotiations skills, Contracts management, M&E Skills	yes included in DLI4-1	7	12	18	18	862.07	41,379.31	During implementation	REG	Evaluation at end and certificate given
Total Fiduciary				10	38793	46552	46552	-	131,896.55			

	Action Description	Description	DLI (Yes/No)		FY 2018/19 target	FY 2019/20 target	FY 2020/21 target	Average cost in EUR	Total cost in EUR	Date Due	Responsible party	Completion Measurement
3-Climate, Environmental and social												
T3-1	Environmental Protection	Environmental assessment and Protection	yes included in DLI4-1	3	4	8	8	4310.34	86,206.90	During implementation	REG	Evaluation at end and certificate given
T3-2	Gender mainstreaming	Strengthen procedures within REG to promote equitable access/allocation of benefits and impacts of rural electrification with special consideration for vulnerable groups	yes included in DLI4-1	0	15086	an	0	0	15,086.21	During implementation	REG	Documented procures developed on mainstreaming Gender
T3-3	Health & Safety	Conduct Training on Construction Health & Safety, first-aid, firefighting, emergency drills, Use of PPE including HIV prevention.	yes included in DLI4-1	306	549	600	600	344.83	603,103.45	During implementation	REG	Evaluation at end and certificate given
T3-4	Technical assistance expert	Strengthen capacity for ESIA, preparation, review, approval, monitoring and supervision approval through; (a) recruitment of two more safeguard specialists (one environmental and one sociologist) for EDCL. (b) dedicated staff for PROGRAM processing at the RDB	yes included in DLI4-1	0	2	2	2	86206.90	517,241.38	By January 19	REG	Contract signed for 1 Environmentalist and 1 Sociologist both at Post
T3-5	Gender policy	study	yes included in DLI4-1	0	17241.37931	0	0	0	17,241.38	By November 2019	REG	Study report approved by board of director
Total Climate, environment and social				309	411,293	241,379	241,379		894,052			