



1. Program Information

Country
Rwanda

Practice Area (Lead)
Energy & Extractives

Programmatic DPF

Planned Operations
3

Approved Operations
4

Operation ID
P162671

Operation Name
Rwanda Energy DPO

L/C/TF Number(s)
IDA-61560

Closing Date (Original)
30-Jun-2019

Total Financing (USD)
125,308,920.12

Bank Approval Date
01-Dec-2017

Closing Date (Actual)
30-Jun-2019

	IBRD/IDA (USD)	Co-financing (USD)
Original Commitment	125,000,000.00	0.00
Revised Commitment	125,000,000.00	0.00
Actual	125,308,920.12	0.00

Country
Rwanda

Practice Area (Lead)
Energy & Extractives

Operation ID
P166458

Operation Name
Rwanda Energy Sector DPO2 (P166458)



L/C/TF Number(s) IDA-61560,IDA-63440	Closing Date (Original) 30-Jun-2020	Total Financing (USD) 124018048.00
Bank Approval Date 15-Nov-2018	Closing Date (Actual) 30-Jun-2020	
	IBRD/IDA (USD)	Co-financing (USD)
Original Commitment	125,000,000.00	0.00
Revised Commitment	125,000,000.00	0.00
Actual	124,018,048.00	0.00

Country
Rwanda

Practice Area (Lead)
Energy & Extractives

Operation ID
P169040

Operation Name
Third Rwanda Energy Sector DPO (P169040)

L/C/TF Number(s) IDA-63440,IDA-64850,IDA-66290	Closing Date (Original) 30-Jun-2021	Total Financing (USD) 226793939.19
Bank Approval Date 29-Aug-2019	Closing Date (Actual) 30-Jun-2021	
	IBRD/IDA (USD)	Co-financing (USD)
Original Commitment	225,000,000.00	0.00
Revised Commitment	225,000,000.00	0.00
Actual	226,793,939.19	0.00

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2. Program Objectives and Pillars/Policy Areas



a. Objectives

The program document states that the “Program Development Objective (PDO) of the proposed operation is to enable fiscally sustainable expansion of electricity services in Rwanda.

The proposed operation is built around two pillars: (a) contain fiscal impact of the electricity sector, and (b) improve the operational efficiency, affordability, and accountability of electricity service.” (PD1, summary page, PD2, p. 3, PD3, p3, PDSO, summary page). The second pillar consists of four sub-pillars (objectives). Therefore, to assess the program, the review defines its objectives as:

PDO1: Contain the fiscal impact of the electricity sector

PDO2: Transition to least-cost and low-carbon energy mix

PDO3: Increase access to affordable and reliable electricity services

PDO4: Improve the accountability and the transparency of REG

PDO5: Improve the operational efficiency and the quality of electricity services

b. Pillars/Policy Areas

The Development Policy Credits (DPC) had two policy areas: (a) fiscal impact of the electricity sector and (b) operational efficiency, affordability, and accountability of electricity service.

Fiscal impact of the electricity sector. This pillar covered adjustments in electricity tariffs, projections of revenues for and fiscal transfers to the Rwanda Energy Group (REG) consistent with the government’s budget envelope, and adoption of options by the Ministries of Infrastructure and of Economic Planning and Finance to achieve fiscal sustainability in the electricity sector and contain fiscal transfers to the sector.

The present organization of the sector derives from reforms carried out in 2013, when the Electricity, Water, and Sanitation Authority (EWSA) was split, and the Rwanda Electricity Group (REG) took over the electricity utility functions. REG became the holding company of two subsidiaries created after the reforms: (a) EUCL, an electric utility mandated to operate the country’s publicly owned generation, transmission, and distribution assets; provide customer service; and develop the distribution network in the already electrified areas and (b) EDCL, an asset development company mandated to develop new generation plants and expand the distribution grid to provide electricity access to new areas. This split allows for clear financial accountability between energy development (nonrevenue) and utility operations (revenue-generating electricity business). The utilities are owned by the government but are governed under company law as opposed to public service law. MININFRA has the policy setting mandate, and the Rwanda Utilities Regulatory Authority (RURA) regulates the sector and approves electricity tariffs (Source: World Bank Report No- 120612-RW, p. 14)

Operational efficiency, affordability, and accountability of electricity service. This pillar covered aspects of least-cost development for the electricity program and low-carbon energy mix, access to affordable and reliable electricity services, accountability and transparency of REG, and operational efficiency and quality of electricity services. This pillar covers PDO2, PDO3, PDO4 and PDO5.



c. Comments on Program Cost, Financing and Dates

The program consisted of three development policy credits for US\$125 million each and one supplemental credit for US\$100 million. The credits were approved on December 1, 2017 (DPC1), November 15, 2018 (DPC2), August 29, 2019 (DPC3) and May 1, 2020 (supplemental). The credits closed on June 30, 2019, June 30, 2020, and June 30 of 2021 as planned.

3. Relevance of Design

a. Relevance of Objectives

Government strategy

Rwanda progressed rapidly in developing its energy sector during 2007-2017, and access to electricity, installed generation capacity, private sector participation, and quality, reliability, and efficiency of supply improved substantially. The achievements were part of the government's Vision 2020 document (revised 2012) and its First and Second Economic Development and Poverty Reduction Strategies (EDPRS I, EPRS II) of 2008-2012 and 2013–2018, which set ambitious targets for the sector. The National Strategy for Transformation (NST1) (2017–2024) revised the target dates for the country to become a lower- and upper-middle income country and continued the ambitious electrification program with the goal of achieving universal access to electricity by 2024. Energy access was a central part of the plan to achieve Rwanda's goals of more inclusive growth and development. The four documents provide the context for the sector's development and the WBG programmatic series.

Bank strategy

The WBG had supported the government's program of electricity expansion and the programmatic series was an additional step in that support. Electricity was Objective 1 of Pillar 1 (Accelerating economic growth that is private sector driven and job-creating) of the Country Partnership Strategy (CPS) for Rwanda for FY2014–18 and Objective 3 (Expanded access to infrastructure and the digital economy) of the Country Partnership Framework (CPF) for FY2021-26. The CPS viewed the energy sector as enabling private sector investment and improving social welfare while the CPF stressed the need to carry out policy reforms to reduce the high costs of electricity and the unreliability of the service, which constrained private sector development. The program was part of a package of WBG interventions aimed at expanding electricity supply and achieving universal access to it at affordable prices; by supporting these goals, the DPO program supported the twin goals of reducing poverty and improving prosperity. The program was also consistent with the WBG Strategy for the energy sector (2013), which sought to help countries have reliable and affordable energy services.

b. Relevance of Prior Actions

Rationale

1. Number and List of Prior Actions



Objective 1: Contain the fiscal impact of the electricity sector

- PA#1 – *Revenue assessment*. The REG Board of Directors approved the assessment of the current revenue requirement of REG and its affiliate companies contained in the REG Strategic Plan 2017–2026 and started an independent review of said assessment.
- PA#2 – *Revenue assessment*. REG has approved the results of an efficient revenue requirement (ERR) study, piloting the use of efficiency benchmarks in the determination of the revenue requirement trajectory towards cost-recovery.
- PA#3 – *Electricity tariff reforms*. RURA [Rwanda Utilities Regulatory Authority] has implemented new electricity tariffs effective August 13, 2018, introducing new tariff categories and rationalized tariffs for selected consumers.
- PA#4 – *Fiscal transfers projections*. MININFRA [Ministry of Infrastructure] and MINECOFIN [Ministry of Finance and Economic Planning] have jointly (a) adopted options to achieve electricity sector fiscal sustainability and contain budget transfers to the electricity sector in the medium term and (b) submitted the results to the Economic Cluster.
- PA#5 – *Fiscal transfers projections*. The Economic Cluster has approved a medium-term trajectory for fiscal transfers to REG and measures to stay within the budget envelope, including a financing plan for national electrification prioritizing private financing for off-grid solutions, a commitment to implementing the quarterly tariff adjustment, and a decision to pursue a partial listing of EUCL [Energy Utility Corporation Limited] on a stock exchange.

Objective 2: Transition to least-cost and low-carbon energy mix

- PA#6 – *REG investment plan*. The REG Board of Directors approved the outline of the Sector Development Investment Plan, which is based on the LCPDP [Least-cost Power Development Plan].
- PA#7 – *REG investment plan*. MININFRA adopted a resolution requiring the LCPDP to be updated on an annual basis by REG.
- PA#8 – *RDB and investment department capacity*. The Rwanda Development Board (RDB) strengthened the capacity of its Strategic Investment Department (SID) through (i) organizational restructuring of said department; (ii) the appointment of at least one PPP [Public-Private Partnership] analyst; and (iii) the certification on PPP matters of at least two staff of the SID.
- PA#9 – *PPP Law and competition in electricity sector*. The RDB has approved guidelines for implementation of the PPP Law of 2016, which mandates competitive procurement of private sector-owned electricity infrastructure, with the exception of mini-grids that do not require off-taker agreements with the public sector.
- PA#10 – *Energy Sector Strategic Plan*. MININFRA has adopted an updated Energy Sector Strategic Plan (ESSP), covering the period 2017/18–2023/24, which is consistent with the LCPDP and the NEP.
- PA#11 – *Power planning and GHG emissions*. MININFRA has approved an updated LCPDP methodology that, inter alia, incorporates, the government's GHG emission reduction commitments.
- PA#12 – *Containing costs and subsidies and sharing risk with private producers*. REG has approved new standard PPA [Power Purchase Agreements] clauses and a standardized risk allocation matrix applicable to all future IPPs [Independent Power Producers] to ensure adequate risk sharing between REG and the private investors.



- PA#13 – *Containing costs and subsidies and cross-border electricity trade*. RURA has completed a review of its regulatory framework for cross-border electricity trade, which concluded that its grid code and licensing regulations are compatible with electricity trade in the East Africa Power Pool.

Objective 3: Increase access to affordable and reliable electricity services

- PA#14 – The REG Board of Directors (i) approved the technical audit of the Government’s approach to electrification; and (ii) submitted it to MININFRA for its approval.
- PA#15 – *Electricity tariffs*. RURA adopted a new electricity tariff schedule, which includes, inter-alia, time-of-use incentives, demand charges for large consumers, lifeline tariffs for low volume electricity consumers below 15 kWh.
- PA#16 – *Connections policy*. MININFRA approved a new connection policy that eliminates up-front payment of the full connection fee and allows said connection fee to be paid over time.
- PA#17 – *Standards for solar systems*. The Rwanda Standards Board issued and published in the Official Gazette the national standards consistent with the standards developed by the International Electrotechnical Commission (IEC) for solar systems and the MININFRA approved the Guidelines on Minimum Standard Requirements for Solar Home Systems to Support Off-Grid Standards Enforcement.
- PA#18 – *National Electrification Plan*. REG has approved the NEP [National Electrification Plan], which identifies principles for investments to achieve universal access by 2024 and close the gender access gap and submitted it to MININFRA for approval.
- PA#19 – *On and off-grid solutions – investments*. MININFRA has (a) adopted procedures for implementing investments in on-grid and off-grid electrification; and (b) approved a grid extension plan prepared in full accordance with the least-cost options.
- PA#20 – *Off-grid solutions – guidelines*. MININFRA has approved guidelines setting minimum requirements for off-grid solutions that are consistent with international best practice to ensure that off-grid solutions remain affordable in Rwanda.
- PA#21 – *Off-grid solutions – incentives*. REG has approved an incentive scheme to make off-grid solutions affordable for low-income households.
- PA#22 – *Regulations for mini-grids*. (a) RURA has updated the simplified licensing framework for mini-grids that do not require an off-taker agreement with the public sector; (b) RURA has issued and published the technical specifications for mini-grids; and (c) MININFRA has approved the investment guidelines for mini-grids.

Objective 4: Improve the accountability and the transparency of REG

- PA#23 – *Financial accountability-International Financial Reporting Standards (IFRS)*. The REG Board of Directors (i) endorsed the shift to consolidated financial reporting of REG and its affiliates and the revision of the chart of accounts, compliant with IFRS requirements; and (ii) approved the roadmap towards compliance with IFRS.
- PA#24 – *Financial accountability-IFRS standards*. The financial statements of EUCL for the year ended June 30, 2018, have been prepared according to IFRS and audited by an independent auditor.
- PA#25 – *Financial accountability-IFRS standards*. REG has completed its transition to IFRS, as evidenced by the unqualified opinion of the independent auditor on the financial statements of both REG and EUCL;



- PA#26 – *Financial accountability-transparency*. The REG Board of Directors has mandated the external audit and publication of the financial statements of REG, EDCL (Energy Development Corporation Limited) and EUCL financial statements within the first quarter of the following financial year.

Objective 5: Improve the operational efficiency and the quality of electricity services

- PA#27 – *REG metering*. The REG (i) initiated piloting the use of bulk metering to accurately measure systems losses; and (ii) approved the plan for commercial losses reduction of EUCL.
- PA#28 – *REG CEO and CFO*. MININFRA piloted the use of competitive international hiring of key staff in REG by (i) completing the competitive hiring of the new REG CEO; and (ii) initiating the competitive hiring process for the appointment of a new REG CFO.
- PA#29 – *REG and quality of service*. REG has approved a strategy and the related operational procedures for improving commercial customers' quality of service and the general quality of electricity supply.
- PA#30 – *REG and GIS use*. (a) REG has fully staffed the GIS [Geographic Information System] unit; (b) REG has revised the operational procedures for new connections to include GIS data collection for all new connections; (c) REG has approved the piloting of GIS data in the identification of grid faults and complaint resolution.
- PA#31 – *REG, corporate planning and human resources*. REG has adopted operational procedures for efficient corporate planning and HR [Human Resources].
- PA#32 – *REG and customer billing*. REG has fully transitioned to automated customer and bill management using its new Integrated Business Management System (IBMS).

2. Assessing Relevance of Prior Actions

Objective 1: Contain the fiscal impact of the electricity sector

- PA#1, PA#2, PA#4, PA#5. *Revenue assessment and fiscal transfer projections*. The relevance of PA#1, PA#2, PA#4, PA#5 is *Satisfactory*.

Electricity tariffs did not keep up pace with the expensive additions to generating capacity and with the public investments program that expanded transmission, distribution and streetlighting. As a result, the sector needed fiscal transfers to sustain its operational costs and investments; transfers reached 1.9 percent of GDP at the time of preparing DPO3 (August 2019) and were expected to exceed 4 percent of GDP by FY2020/21. Under these conditions, the sector's expansion could deteriorate the country's fiscal stability and stall its growth. To address these issues, it was necessary to seek that tariff revenues pay for the full cost of service and that such cost must reflect operational efficiency to prevent consumers from paying for wasteful expenditure; because it would take time to achieve these goals and while tariffs reflect the full cost of service the government's transfers to the sector would have to be affordable and socially acceptable. The program sought to help achieve these goals by supporting (a) a sound assessment of future revenues under efficiency benchmarks while piloting the use of benchmarks (PA#1, PA#2), (b) the adoption of options to achieve fiscal sustainability in the electricity sector (PA#4) and (c) adoption of measures to stay within budget after the Economic Cluster approves a medium-term trajectory for fiscal transfers to REG, including a commitment to implementing quarterly tariff adjustments and partially listing the Energy Utility Corporation Limited (EUCL) on a stock exchange (PA#5).



- PA#3, PA#5 – *Electricity tariffs*. The relevance of PA#3, PA#5 is *Satisfactory*.

The previous discussion highlighted the need to raise electricity tariffs to reduce the sector's potential deficit and the fiscal transfers to finance it. The increase in tariffs should be consistent with the expected transfers to the sector in the medium term. PA#3 referred to a tariff adjustment which raised the average cost recovery level, introduced new tariff categories, and rationalized tariffs for selected consumers. PA#5 referred to future quarterly tariff increases which capture the fiscal trajectory of the transfers to the sector approved by the Cabinet.

Objective 2: Transition to least-cost and low-carbon energy mix

- PA#6 - PA#11. The relevance of PA#6, PA#7, PA#8, PA#9, PA#10, and PA#11 is *Satisfactory*.

Prior to the third DPO, the government's approach to building electricity infrastructure was to negotiate agreement based on unsolicited proposal [i.e., no open bidding]. Since most of the newly procured generation capacity was through independent power plants constructed by private parties, the uncompetitive procurement of electricity drove up the power purchase tariffs faced by the Government. This approach resulted in a higher financial burden for the government because it was inconsistent with least-cost planning and did not take into account demand conditions nor risk-sharing between private investors and the Rwanda Energy Group. The second DPO started addressing these problems by supporting the approval of new guidelines for implementing the Public-Private Partnership [PPP] Law of 2016, which mandated the competitive procurement of private sector-owned electricity, except for mini-grids that do not require offtake agreements with the public sector. The changes brought transparency and competition into procuring privately-owned generation capacity at least-cost. Having laid the groundwork for competitive bidding and selecting lowest cost projects, it was still necessary to: (a) have an outline of the investment plan for the sector based on the least-cost solution (PA#6); (b) update the least-cost plan every year (PA#7), (c) build capacity in the investment department of the Rwanda Development Board (PA#8); (d) approve guidelines for implementing the PPP Law (PA#9); and (e) adopt of a six-year energy sector strategic plan for the period FY2017/18-FY2023/24 (PA#10). Having gained some experience in preparing least-cost development plans, the government revised the methodology to prepare them, and incorporate reductions in greenhouse gases compatible with its commitments with the Paris agreement (PA#11).

- PA#12. The relevance of PA#12 is *Satisfactory*.

The 2014 reforms to the sector managed to attract direct investment of over 20 independent power producers (private developers) which brought a large increase in capacity which the private sector financed in large part. The new investments in electricity generation were, in general, implemented through directly negotiated deals which prevented the country from getting the benefits of transparent, competitive processes. To address the problems created by these deals and to ensure that the investments for all the segments of the electricity supply chain (generation, transmission, and distribution) are procured through competitive processes, REG issued a new document that defined its future relations with IPP and the rules governing the power-purchase agreements (PPA) with them. The changes represent a new institutional arrangement and structure which is expected to improve risk management between the government and the IPP. PA#12 supported these changes.

- PA#13. The relevance of PA#13 is *Satisfactory*.



Rwanda is a member of the Eastern Africa Power Pool (EAPP), a regional institution established in 2005 to coordinate cross-border power trade and grid interconnection among nations of the Eastern Africa region. The EAPP currently has eleven (11) members and four synchronized networks (or interconnected “clusters”), of which Rwanda belongs to one, the Rwanda–Burundi–East DRC network. The pool seeks to facilitate and secure power supply to the Eastern Africa Region at the lowest possible cost. To access this pool Rwanda had to verify that its regulatory framework does not constitute a barrier to electricity trade and that its grid code and licensing regulations allow it to trade electricity in the EAAP. With the rules for access verified, Rwanda can benefit from buying cheaper energy from its partners. PA#13 supported this process.

Objective 3: Increase access to affordable and reliable electricity services

To achieve the goals of its National Strategy for Transformation the government sought to ensure that electricity production expanded according to plan, at the lowest cost possible and that poor people, especially those in rural areas, could afford it. These goals could be achieved using off-grid solar solutions, whose costs had fallen sharply and could reach poor areas where the costs of expanding the grid and the tariffs to recover them would be high and unaffordable to poor households. The government plans envisaged that off-grid solutions affordable to low-income households would reach 48 percent of the population.

- The relevance of PA#14 is *Satisfactory*.

The strategy required to use new ways of producing and supplying electricity to consumers. To achieve that, REG, the implementing agency, and the Ministry of Infrastructure had to approve the strategy. PA#14 reflected this process, which consisted of REG’s Board of Directors approving the technical audit of the Government’s approach and then submit it to MININFRA.

- The relevance of PA#15, PA#16 is *Satisfactory*.

Demand side issues. Two prior actions addressed them. PA#15 supported changes in the level and structure of electricity tariffs which sought to ensure that consumers use electricity efficiently and poor people have access to it. The changes included, among others, charges for large consumers, lower tariffs for customers using less than 15 kwh, and incentives for time-of-day use. PA#16 addressed the affordability of connection fees by poor households, which lacked access to credit and could not afford to pay it in one tranche; PA#16 supported authorizing the payment in installments, making it possible to pay the fee.

- The relevance of PA#17-PA#22 is *Satisfactory*.

Supply side issues. Several prior actions addressed these issues. These can be split in two. The first group (PA#17, PA#18) addressed the standards for solar systems –which Rwanda lacked and were necessary for its solar energy policy to succeed. PA##17 supported establishment of national standards consistent with international ones. PA#18 supported REG approving a National Electrification Plan meeting these new standards and submitting them to MININFRA for approval. These standards had to guarantee access for all by 2024, and close the gender access gap.

The second group (PA#19-PA#22) addressed off-grid energy issues: implementing investments, incentives, regulations for mini-grids and guidelines for standards to be met. PA#19 sought to ensure the sustainability of the off-grid market by supporting the government’s adoption of procedures for implementing investments in on- and off-grid electrification and the approval of an investment plan adhering to the least-cost option. PA#20 sought to ensure that off-grid solutions are affordable and meet requirements consistent with



international best practices. PA#21 sought to provide incentives for off-grid energy producers to ensure that they deliver affordable energy to low-income households. PA#22 sought to simplify the regulations for mini-grids that lack an offtake agreement with the public sector and to ensure that investment and technical specifications guidelines are clear.

Objective 4: Improve the accountability and the transparency of REG

REG's expenditures exceeded its revenues, making it financially dependent upon the government, donors and limited commercial loans to cover its operational deficit and finance its investment program. Rwanda was able to get private finance for electricity generation with REG's commitment to buy it and the government guaranteeing REG's payments with sovereign guarantees. There were also other problems: (a) REG's two subsidiaries used different accounting methods (cash basis in EDCL, accrual basis in EUCL); (b) REG did not publish the financial statements of its subsidiaries and (c) REG's financial statements did not meet international financial reporting standards. The problems meant that REG lacked the financial means and the agility to respond well and promptly to meet the needs and demands of the government's ambitious expansion program. To address these issues, it was necessary to improve REG's financial condition – covered under objectives 2 and 3– and to bring its financial statements up to international standards, to raise REG's financial transparency and accountability.

- The relevance of PA#23-PA#26 is *Satisfactory*.

The prior actions sought to create the conditions for improving REG's transparency and accountability. For this, it was necessary to have:

- REG's Board of Directors approve the (a) shift to a consolidated reporting of REG and its affiliates accounts, (b) revisions to its chart of accounts and (c) roadmap towards compliance with international financial reporting standards. PA#23 supported these changes.
- An independent auditor to audit EUCL financial statements prepared and reported using IFRS. PA#24 supported this result.
- REG complete its transition to IFRS, which would be demonstrated by the unqualified opinion of the independent auditor regarding REG and EUCL statements. PA# 25 supported this result.
- REG's Board of Directors mandate the external audit and publication of REG's, EDCL's and EUCL's financial statements within the first quarter of the following financial year. PA#26 supported this decision.

Objective 5: Improve the operational efficiency and the quality of electricity services

REG and its two affiliates, EUCL and EDCL, had problems in their operational performance. EUCL's total electricity losses were high, resulting in substandard services, high generation costs, a large financial burden for the treasury, and inability to finance the expansions in generation and transmission with its own resources. Among the reasons for these problems were weak managerial capacity and inadequate information systems which could not monitor system's losses and failures, preventing the companies from correcting them.

- The relevance of PA#27-PA#32 is *Satisfactory*.



Improving service required adopting new procedures and introducing technological advances for REG to trace a roadmap for improvement. The prior actions sought to support:

- Improving data collection on losses and having strategies to improve performance based on good quality data. PA#27 supported this effort through the use of bulk metering (in a pilot phase) and preparing a plan to reduce EUCL's commercial losses.
- Improving the quality of REG's senior management by institutionalizing its selection through an international competitive hiring process. PA#28 supported this effort through a pilot process with the hiring of REG's Chief Executive Office and, after a successful selection, applying the same process for REG's new Chief Financial Officer.
- REG: (a) adopting procedures for improving the quality of service to commercial consumers and overall quality of electricity supply (PA#29); (b) using geospatial planning to identify consumers and locations with network faults to resolve problems promptly (PA#30); (c) adopting operational procedures to improve the efficiency of its corporate planning and human resource management (PA#30); and (d) using its new Integrated Business Management System (IBMS) for the automatic management of bills and customers (PA#32).

Rating

Satisfactory

4. Relevance of Results Indicators

Rationale

Rationale

Objective 1: Contain the fiscal impact of the electricity sector

- RI#1 from prior actions #1, 2, 4, 5. The relevance of RI#1 is *Moderately Satisfactory*.

Containing electricity subsidies as percentage of GDP imperfectly measures the effort to stem the amount of resources sent from the central government to REG. The ratio can fall because GDP grows while nominal transfers do not change, or nominal transfers fall while GDP remains constant; the second case constitutes a more serious effort at containing the fiscal impact of the electricity sector than the first one. A second point to note refers to using "electricity subsidies" to identify the indicator, which could be confused with subsidies to consumers or producers instead of "fiscal transfers". The ICR makes clear that "subsidies are defined as budget transfers to the sector" (par. 63); the program documents also explain that they refer to budget transfers. The indicator can be measured, and the information can be obtained.

- RI#2 from prior actions #3, 5. The relevance of RI#2 is *Satisfactory*.

The indicator measures whether authorities raised electricity tariffs, independent of the amount. A rise in tariffs reflects on REG's operating income, deficit, surplus, and on its needs for fiscal transfers. With RI#1 the indicator



measures progress towards achievement of the objective. The indicator can be measured and the information can be obtained.

Objective 2: Transition to least-cost and low-carbon energy mix

- RI#3 from prior actions #6 - 13. The relevance of RI#3 is *Satisfactory*.

The indicator measures if new electricity generation and transmission projects meet the least-cost criteria of the power development plan, are procured under competitive conditions, and comply with the rules and conditions established in the PPP law. The indicator can be measured, and the information can be obtained.

Objective 3: Increase access to affordable and reliable electricity services

- RI#4 from prior actions #14 - #22. The relevance of RI#4 is *Highly Satisfactory*.

The indicator captures well the coverage of electricity services at the national level. The indicator can be measured and the information can be obtained.

- RI#5 from prior actions #14 - #22. The relevance of RI#5 is *Highly Satisfactory*.

The indicator measures well the coverage of electricity services in rural areas. The indicator can be measured and the information can be obtained.

Objective 4: Improve the accountability and the transparency of REG

- RI#6 from prior actions #23-26. The relevance of RI#6 is *Satisfactory*.

Publishing independent audits of REG, EDCL and EUCL that meet international financial reporting standards raises transparency and contributes to improve accountability. The indicator can be measured and the information can be obtained.

Objective 5: Improve the operational efficiency and the quality of electricity services

- RI#7 from prior action # 23 – 26, 31. The relevance of RI#7 is *Highly Satisfactory*.

The indicator measures well the gains in efficiency in the electricity sector. The indicator measures the reduction of losses as percent of supply. The indicator can be measured and the information can be obtained.

- RI#8 from prior action # 29 -32. The relevance of RI#8 is *Highly Satisfactory*

The indicators measures well the gains in the quality of electricity services in Rwanda. One measures the average duration of interruptions (SAIDI) and the other measures the average frequency of interruptions (SAIFI). They are used internationally to measure quality of service. The indicators can be measured and the information can be obtained.

- RI#9 from prior action # 29 - 32. The relevance of RI#9 is *Moderately Satisfactory*.



The indicator measures if the survey was carried out but does not inform how customers feel about the quality of electricity services. The indicator can be measured and the information can be obtained.

Summary Table on Results Indicators

RI description (assigning a number to each RI)	Associate d PA(s)	RI relevance	Baseline (including units and date)	Target (including units and date)	Actual value as of target date	Actual change in value of RI relative to targeted change	Most recent value available (if not target date)	RI achievement rating
Objective 1: Contain the fiscal impact of the electricity sector								
RI1. Contain electricity subsidies as percentage of GDP	PA1, PA2, PA4, PA5	MS	1.4% in FY2016/17	=<1.5% FY2020/21	0.9% FY2020/21 (ICR, Table 6)	3 times		High
RI2. Implement quarterly tariff adjustment	PA3, PA5	S	No FY2016/17	Yes FY2020/21	No. Postponed after full tariff review in 2022	n.a.		Negligible
Objective 2: Transition to least-cost and low-carbon energy mix								
RI3. Ensure all generation and transmission projects initiated or accepted by the government over the past 24 months are consistent with the LCPDP and comply with the PPP Law and competitive procurement procedures	PA6-PA13	S	No September 2017	Yes December 2021	Yes June 30, 2021	n.a.		High
Objective 3: Increase access to affordable and reliable electricity services								
RI4. Expand electrification rate nationwide (percentage of households)	PA14 - PA22	HS	a. 40.7 % nationwide (29.7% on-grid and 11% off-grid)	a. 61% nationwide (38% on-grid and 23% off-grid)	a. 65% overall (47% on-grid; 18% off grid) <u>2/</u>	a. 1.2 times b. 18%	a. 74.5% nationwide (51% on-grid; 24% off grid)	Substantial



			October 2017	December 2020	FY2020/20 21		September 30, 2022	
				b. 21% among female- headed households 2016	b. 42% among female- headed households 2019	b. 24.8% among female- headed households		
						November 2017		
RI5. Expand electrification rate among rural households (percentage of households)	PA14 - PA22	HS	16 percent June 2017	25 percent December 2020	37 percent 2020 <u>1/</u>	2.3 times	38 percent 2020 <u>4/</u>	High
Objective 4: Improve the accountability and the transparency of REG								
RI6. The independent audits of REG, EDCL, and EUCL are in compliance with IFRS, without qualifications and published within the first two quarters of the following year	PA23 - PA26	S	No	Yes		Yes <u>5/</u>		High
Objective 5 Improve the operational efficiency and the quality of electricity services								
RI7. Reduce total electricity sector losses as a percentage of electricity supply	PA27, PA28, PA3HS		22 percent FY2017/18	19 percent FY2019/20	19.4 percent March 2020	0.87 times	18.2% 07/2021 - 06/2022	Substanti al
RI8. Reduce average duration of interruptions (SAIDI) and average frequency of interruptions (SAIFI):	PA29 - PA32	HS	a. SAIDI: 44 hours b. SAIFI: 265 hrs. 7	a. SAIDI: 28 hours b. SAIFI: 201 183.4 hours 2020	a. 17.2 hours <u>1/</u> b. 37 hours	a. 1.6 times b. 2.8 times	a. 18.2 hours b. 44 hours Both for 07/202 1 - 06/2022	High



1/

RI9. Implement and publish annual customer satisfaction survey	PA29 - PA32	MS	No	Yes	2020 both	Yes	Substanti
Sources:			2017	2020		FY2020/21	^{al}

1. The World Bank, Implementation and Completion Results Report on a Series of Four Credits to the Republic of Rwanda, Report No: ICR00005690, June 7, 2022
2. Rwanda Energy Group Ltd Consolidated Annual Report and Audited Financial Statements for the Year Ended 30th June 2021, for RI4, RI6, RI7, RI8
3. [https://www.reg.rw/what-we-do/access/#:~:text=Electricity%20access,grid%20systems%20\(mainly%20solar\).](https://www.reg.rw/what-we-do/access/#:~:text=Electricity%20access,grid%20systems%20(mainly%20solar).)
4. RI5, Access to electricity, rural
<https://data.worldbank.org/indicator/EG.ELC.ACCS.RU.ZS?end=2020&locations=RW&start=2012>
5. The Annual Report of REG for the year ended 30th June 2021 is available online on REG’s website. The report includes the performance of EUCL and EDCL (<https://www.reg.rw/public-information/reports/>). There are also the independent reports for EUCL and EDCL.

Rating

Satisfactory

5. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

Contain the fiscal impact of the electricity sector

Rationale

Under this objective, the program supported interventions to assess future revenues of REG, project future fiscal transfers to REG and raise electricity tariffs to contain the fiscal impact of the sector’s losses.



The expected results were to: (a) contain electricity subsidies to less than 1.5 percent of GDP and (b) raise electricity tariffs. Raises in electricity tariffs were postponed until their revision in 2022. Electricity subsidies to REG fell to 0.9% of GDP in FY2020/21. The achievement was negligible for electricity tariffs and high for reducing subsidies. The combined achievement of the results is rated substantial, since the purpose of the program was to contain the fiscal impact of the sector, which was achieved. PA#1-PA#5 covered this objective.

Rating

Moderately Satisfactory

OBJECTIVE 2

Objective

Transition to least-cost and low-carbon energy mix

Rationale

Under this objective the program supported interventions aimed at preparing an investment plan for REG, building capacity in MININFRA –overseer of REG–, introducing competitive practices in procuring electricity from independent power producers and in sharing the risks of electricity production with private producers, which the State used to absorb before these reforms.

The expected result was to have all generation and transmission projects initiated or accepted by the government to meet the standards set in the least-cost power development plan and comply with the conditions on competitive procurement established in the public-private-partnership law. As of December 2021, there had not been projects procured and the new projects planned for 2021 were consistent with least-cost power and competitive procurement procedures. The achievement of the result is rated high. PA#6-PA#13 covered this result.

Rating

Satisfactory

OBJECTIVE 3

Objective

Increase access to affordable and reliable electricity services

Rationale

Under this objective the program supported interventions geared to create the conditions for expanding the on-grid and off-grid solutions to the energy system. For that purpose, the government's approach to



electrification was audited and submitted to MININFRA for its approval, REG approved a national electrification plan, and the standards and incentives to build off-grid solutions were defined; the actions were carried out in agreement with the least-cost options for developing the sector.

The expected result was to increase both the nationwide electrification rate to 61 percent and the rural electrification rate to 25 percent by December 2020. The nationwide rate rose to 75 percent by September 30, 2022, and the rural rate rose to 38 percent in 2020. The achievements of the two results are rated high. In addition to these results, the program also expected to increase the electrification rate among female-headed households to 42 percent, but by the end of 2019 (most recent data) the rate had risen to 25 percent. The achievement of this result is rated modest. The combined achievement of the three results is rated substantial. PA#14-PA#22 covered these results.

Rating

Satisfactory

OBJECTIVE 4

Objective

Improve the accountability and the transparency of REG

Rationale

Under this objective the program supported interventions to raise the standards for REG's financial accountability and to improve the transparency of its financial accounts. To achieve these goals, REG and its subsidiaries (EDCL and EUCL) had to adopt international financial reporting standards to report the results of their operations, which had to be audited and unqualified and published.

The expected result was to have the reports published within the first two quarters of the following year. The Annual Report of REG -which includes the results for EDCL and EUCL- for the year ending June 30th, 2021 is available in REG's website; the website also has the separate reports for EDCL and EUCL. The achievement of this result is rated high. PA#23-PA#26 covered these results.

Rating

Satisfactory

OBJECTIVE 5

Objective

Improve the operational efficiency and the quality of electricity services



Rationale

Under this objective the program supported interventions to measure electricity losses accurately, hire top quality managers for REG using competitive international recruiting, automate customer billing and its management, and use modern tools such as geographic information systems to identify grid faults and solve customer complaints.

The expected results were to implement and publish an annual customer satisfaction survey and to reduce the share of electricity supply lost from 22 percent to 19 percent and the average *duration* and *frequency* of interruption from 44 and 265 hours to 28 and 183 hours. Electricity losses fell to 18.2 percent and the average duration and frequency of interruptions fell to 18.2 and 44 hours; their achievement is rated high. A survey was done in 2020, but it is unclear if others were done in 2021 and 2022; it is unknown if the consumers are satisfied with the quality of service. The overall rating for the results in this objective is substantial.

Rating

Satisfactory

Overall Achievement of Objectives (Efficacy)

Rationale

The program had prior actions and most results indicators of satisfactory relevance. Its overall level of achievement was satisfactory. Since efficacy was Satisfactory for four objectives and Moderately Satisfactory for one, overall efficacy is rated Satisfactory.

Overall Efficacy Rating

Satisfactory

6. Outcome

Rationale

With relevance of prior actions rated as substantial and efficacy rated satisfactory, the overall outcome rating is Satisfactory.

a. Rating



Satisfactory

7. Risk to Development Outcome

The outcomes achieved are likely to be sustained but they are not free from risk. The risks arise from the impact of: (a) a slowdown in domestic and international economic activity; (b) political constraints to increasing tariffs to enable REG to finance its expansion plans and reduce its dependence on fiscal transfers. The economic slowdown could reduce REG's and government revenues, making it difficult to close the gap between REG's growing financing needs and the government's goal of containing fiscal transfers to REG. The inability to increase tariffs would have a similar impact as the economic slowdown: it would increase REG's reliance on fiscal transfers and imperil fiscal stability if the government pursues its electrification policy no matter the cost.

8. Assessment of Bank Performance

a. Bank Performance – Design

Rationale

The WBG designed a coherent program with a sound and logical results chain and framework. The design reveals a substantial knowledge of the country and of the sector's problems. The design built on knowledge gained and lessons derived from closed and ongoing WBG investment project finance operations in Rwanda. The design also built on analytical work that provided the support for most of the prior actions and the results indicators of the program; some of the prior actions and results indicators were refined or modified as the program advanced to make them more precise and useful to assess its impact. From that knowledge the WBG derived the policies that had to be implemented through a series of development policy operations, which had a medium-term policy reform horizon. The results indicators were realistic and achievable, could be measured, the information could be obtained, and in most instances measured well the achievement of objectives.

The WBG innovated in the way it approached the design by making projections about the potential fiscal risks of the sector's expansion before the risks materialized. It also included important triggers on the basis that they could be refined when defining the prior actions for subsequent operations and collected data for the results target before the next operation.

Some minor shortcomings in the design had to do with the baseline and target values for the system losses and national electrification goals and to arrangements for collecting data to verify the results.

Rating

Satisfactory

b. Bank Performance – Implementation

Rationale



The results framework guided the supervision of the program. Because implementation problems were minimal, the operations were executed quickly, enabling the team to remain focused on the program and the successive operation. The implementation activities allowed the WBG to strengthen some prior actions of the new operations, introduce new prior actions to reflect the objective of electrification on the least-cost plan, and dropped planned prior actions (i.e., triggers) that had already been carried out (i.e., triggers 2.3, 2.6, 2.9, 3.10, 3.11), a decision which helped strengthen the program's design and performance.

The COVID-19 pandemic prevented carrying out the household survey which was to provide the information for the coverage of electricity in female-headed households. The information was obtained from the Demographic and Health Survey carried out before the COVID-19 pandemic started.

The WBG followed program implementation closely. Two implementation status reports (06/11/2018 and 1/11/2019) informed well about the program's advances and the results achieved.

Rating

Satisfactory

c. Overall Bank Performance

Rationale

Bank performance was satisfactory both in the operation's design and in the implementation phases.

Overall Bank Performance Rating

Satisfactory

9. Other Impacts

a. Social and Poverty

The expected net impact of tariff increases on the poor was to be very small, in most cases because of the low level of electricity consumption in households. This was the result of a new tariff schedule which included a lifeline tariff for households consuming less than 15 kWh, which represents a cross-subsidy from high- to low-income consumers. Also, the policy of paying for connections in installments facilitated the access to electricity.

b. Environmental

The program document did not foresee actual environmental impacts. The program supported the expansion of off-grid electricity which encouraged the use of solar panel technologies and the ICR notes that the



environmental effect of handling solar panels and batteries is being handled by the Renewable Energy Fund project.

c. Gender

The only impact reported refers to the percentage of female-headed households with access to electricity services in results indicator 4. The access to electricity is likely to have benefitted women in particular, since it saved them time in chores such as gathering firewood, freeing their time for rest or more productive activities.

d. Other

The DPO series supported Rwanda to reinforce, broaden, and advance institutional reforms in a deeper and systematic manner, a task that the WBG had started years earlier with several investment projects in the sector. These advances are reflected in the quality of its regulatory framework, which the African Development Bank (AfDB) measures through its Electricity Regulatory Index (ERI). In the 2021 survey of the AfDB, Rwanda appears ranked in 10th place among 45 countries in the capacity of the regulatory authorities to carry out their functions, and 6th in the composite index of regulatory governance and regulatory substance index. Rwanda still has some room for improvement on the impact of its regulations; in the regulatory index for outcomes, which measures the impact on utilities and sector, Rwanda ranks 20th among the 45, because of the continuation of subsidies, low-cost recovery and the absence of a schedule for achieving full cost recovery tariffs.

10. Quality of ICR

Rationale

The ICR informs well about the program's design, implementation and achievements. Its evidence is adequate to support the achievements reported, and Annex 5 lists the analytical work used in the program's design. Some tables in the main text lack sources or the source is so generic (e.g., World Bank) that it is of little value. Section III.B on efficacy could have been shorter if it had limited its discussion to the quality and relevance of the results indicators. The report uses the evidence presented to derive its lessons, which could have been shorter, sharper, and to the point.

The analysis supports the conclusions about the results achieved. Its analysis of prior actions overestimates their relevance, rated highly satisfactory in most cases. The case of tariff increases (PA3 and PA5) illustrates the problem. The ICR rates *highly satisfactory* their relevance. The program documents did not define the amount by which tariffs would increase, making it difficult to relate this action to a reduction in the fiscal transfers to REG. Because the overall rating for the achievement of objectives is constrained by the ratings for results indicators, the overstated ratings of prior actions did not affect the final program rating, which concurs with the rating of this review. Despite these observations, the review concludes that the report assesses well the program's performance.

Other comments are:



- Table 5 on PA for Pillar B4 (Objective 5 of ICRR) is missing PA 2.10 of the program document (PA#31 of this review).
- The text in paragraphs 49 and 57 indicate that there is some confusion about how to determine relevance of prior actions.
- The text in par. 78 does not present a logical reason to rate indicator RI6 (B4 of program document) highly satisfactory.
- Section IV.A. under Bank Performance is titled **Other Unintended Outcomes and Impacts**.

Annex 2 on staff time and costs of program preparation and supervisions is unclear. It is not possible to know how much it cost to carry out the four operations.

a. Rating

Substantial

11. Ratings

Ratings	ICR	IEG	Reason for Disagreement/Comments
Outcome	Satisfactory	Satisfactory	
Bank Performance	Satisfactory	Satisfactory	
Relevance of Results Indicators	---	Satisfactory	
Quality of ICR	---	Substantial	

12. Lessons

The most pertinent lessons from the ICR are:

- Financial imbalances in power companies are likely to turn into financial crises if the problems in the sector are not diagnosed and their causes addressed on time. A signaling device of potential problems can be the gap between the average cost of supplying one kWh of electricity and the average revenue from its sale and the high cost of an investment pipeline aimed at closing a deficit created in part from low levels of cost recovery.
- Reforms affecting multiple sectors or parties are likely to be better designed and to succeed if the affected parties participate in diagnosing the problems, identifying their causes, and in designing and executing the solutions. For example, the Ministry of Finance and Economic Planning finances the capital expenditures and operating costs and the Ministry of Infrastructure is responsible for the energy sector. The two ministries worked together to define a trajectory of fiscal transfers for the medium-term while sector reforms were implemented toward full-cost recovery.
- Reform proposals that have a larger societal impact are unlikely to succeed if there is no buy-in of them at high levels of government. After defining the fiscal transfers mechanism, the Ministries of Finance and



Infrastructure jointly sought approval from the Cabinet's Economic Cluster, building a sense of shared ownership of the policy which contributed to institutionalize the reforms in the sector.

- Supplying electricity to the poorest 40 percent of households is a daunting challenge in low-income countries. The experience of the program in Rwanda shows that affordability by households was the main constraint to the expansion of off-grid connections. The wide range of proposed reforms (e.g., investment incentives, subsidies, minimum technical standards, lighter regulation, financing mechanisms for connections) was insufficient to overcome that constraint and achieve the program's coverage goal. Therefore, to assess the realism of the program's goals it may be worthwhile to carry out surveys of potential beneficiaries to elicit their true demands, search for non-traditional solutions, innovate on what could be done to achieve the stated goals, and research the experience of programs in other countries that succeeded in their aims.

IEG offers the following lesson derived from points raised in the ICR:

The experience of the program in Rwanda shows that there is room to innovate and not follow usual World Bank practice. First, using projections for electricity demand and the associated revenue can help identify potential risks for the program and design mechanisms to prevent the risks before they materialize. Second, adopting a flexible approach to select and refine prior actions during the program's life and base them on information collected during implementation can help give more precision and relevance to the prior actions and to the results targets.

13. Project Performance Assessment Report (PPAR) Recommended?

Yes

Please explain

The four credits constitute a good example of a well prepared program aimed at improving the performance of the electricity sector.