

**PROGRAM INFORMATION DOCUMENT (PID)
APPRAISAL STAGE**

September 29, 2017
Report No.: 120692

Operation Name	Rwanda Energy Sector Development Policy Loan
Region	AFRICA
Country	Rwanda
Sector	Energy
Operation ID	P162671
Lending Instrument	Development Policy Lending
Borrower(s)	Ministry of Finance and Economic Planning
Implementing Agency	Ministry of Finance and Economic Planning, Ministry of Infrastructure
Date PID Prepared	September 29, 2017
Estimated Date of Appraisal	October 5, 2017
Estimated Date of Board Approval	December 1, 2017
Corporate Review Decision	Following the corporate review, the decision was taken to proceed with the appraisal of the operation.
Other Decision	

I. Country and Sector background

1. **Rwanda is recognized as a leading reformer in Sub-Saharan Africa, with impressive performance in poverty reduction, and has a strong record of reform implementation under programmatic Development Policy Operations (DPOs).** Annual gross domestic product (GDP) growth has averaged 7.5 percent in the last decade. Rwanda's poverty levels have dropped from 57 percent in 2006 to 39 percent in 2014, according to the latest Integrated Household Living Conditions Survey (EICV 4). Rwanda has also been the leading reformer among African economies in the Doing Business indicators, ranking 56 in the world in 2017, second in Africa after Mauritius. However, GDP per capita, which stood at US\$729 in 2016, remains substantially below the average for Sub-Saharan Africa, and Rwanda remains one of the poorest countries in the world, with significant infrastructure investments needed for its socioeconomic development. The Government has demonstrated its strong commitment and ability to sustain programmatic reform efforts, including under three consecutive series of World Bank DPOs in the social protection sector (a total of nine operations over 2009–2017). The Government delivered on the agreed program and implemented deep social protection reforms that established a good practice social protection program (the Vision 2020 Umurenge Program, which covers about 300,000 households) and institutionalized efficiency, accountability, and transparency throughout the social protection system.

2. **Rwanda has implemented successive phases of reforms to create a power sector capable of delivering its mandate, and since 2013 remarkable improvements have been achieved in the sector.** In the latest round of reforms that started in 2014, the Government restructured the key energy sector institutions, with the aim to strengthen accountability,

streamline operations, and create an independent off taker for private sector contracts. As a testimony to the success of these reforms, Rwanda, a poor, landlocked country without significant energy resources, has managed to attract direct investment of over 20 independent power producers. The generation capacity tripled from 76 MW in 2010 to 213 MW in June 2017 (with hydro at 45 percent, oil (heavy fuel oil and diesel) 27 percent, peat 7 percent, solar 4 percent, lake methane 14 percent and imports 3 percent). New capacity was financed, in large part, by the private sector (as of 2017, 52 percent of capacity is under private ownership). Investments in grid extension have increased connections by 230 percent since 2010, covering, as at August 30 2017, 100 percent of hospitals, 93.2 percent of health centers, 92.1 percent of administrative offices, and 69.9 percent of primary and secondary schools. The share of grid-connected households rose from 6 percent in 2009 to 29.7 percent as of August 2017, and off-grid connected households from 0 percent in 2009 to 11 percent in end June 2017. New transmission projects and upgrades are under way to strengthen the network and expand power exchanges with its northern neighbors and several regional hydropower plants are under development.

3. **Improvements in sector outcomes, especially enhanced electricity access, are having a measurable impact on household welfare.** A recent impact evaluation of the World Bank's access investments in Rwanda found increased income and consumption spending, quality and value of houses, and asset creation. Electrification was also found to decrease the household monthly energy expenditure (excluding electricity) and biomass collection costs and time, and increased time spent on education by children and time use for tutoring children.

4. **Despite these achievements, electricity remains a constraint for Rwanda's development due to the high and increasing cost of service, which limits affordability for the Government and consumers.** Rapid system expansion has been achieved at a high cost not only due to country's inherent circumstances, but also because of specific approaches adopted. Rwanda lacks domestic, low-cost energy resources. However, as part of its rapid system expansion, it prioritized domestic solutions over electricity imports from neighboring countries with cheaper supply, such as Ethiopia, Kenya, or Uganda. On top of the inherent disadvantage of limited domestic resources, investment planning was pursued without adhering to least-cost planning principles. Taken together, these decisions led to high unit costs, while the resulting high tariffs (that are still below the actual unit costs) make electricity unaffordable for many, especially households and industry. Access to electricity, currently estimated to be 40.7 percent, remains largely concentrated in the two top quintiles, with almost negligible coverage in the bottom 40 percent of the population. Even at a subsidized rate, firms pay a higher price of electricity compared to neighboring countries, making access to electricity among the main constraints to scaling-up private investment flows.

5. **Caught between high cost of electricity and limited affordability, the Government has stepped in to fill the gap between sector cost and revenues from the budget.** The Government's efforts to meet its ambitious capacity expansion and electricity access targets are increasing financial pressure of the sector. The gap between cost and revenue per unit of electricity (kWh) could increase by 2020, as a number of capital-intensive power plants are scheduled to come online leading to potentially significant increase in utility's revenue requirements.

6. **To proactively address the electricity sector challenges, the Government has put forward a program that represents an adequate reform response to contain sector's financial risks.** The short- to medium-term reform program is underpinned by principles of least-cost planning, competition, accountability, and operational efficiency. By shifting the Government's focus from investment to efficiency and service delivery, the proposed reform program is transformative to how the sector will deliver its mandate. The Government program will further strengthen the role of the private sector in the power sector, which already owns and manages over half of generation capacity and, through its dominant role in the off-grid market, is now also emerging as a strategic partner in the access agenda. By putting in place an adequate framework for investment planning, procurement, and sector governance, and by improving the financial viability and accountability of the off-taker of private generation (Rwanda Energy Group, REG), the proposed operation is maximizing the benefits of private and public investment for the development of the sector.

7. **The World Bank is a strategic partner of the Government in the energy sector, including as co-chair of the joint Government/development partner Sector Working Group, and is actively involved in formulation and reviews of the sector reform program as well as continuously supporting the Government's investments in sector expansion.** Through several operations, the World Bank has supported the Government with expanding access and generation capacity; restructuring Rwanda's electricity utility and improving its efficiency; asset and liability evaluation; sector capacity needs assessments; energy sector agencies' capacity strengthening; and comprehensive assessment of financial viability of the energy sector. The Bank has also advised the Government in formulating its recently adopted Rural Electrification Strategy. The proposed programmatic operation supports the Government in taking many of these reform measures, initiated in previous Bank operations, forward in a structured, pragmatic yet transformative manner.

8. **Rwanda's macroeconomic policy framework is considered adequate for the DPO.** Rwanda's prudent macroeconomic policy has enabled the country to achieve high economic growth and macroeconomic stability in the past decade. Both monetary and fiscal policies have been implemented in a prudent manner. A difficult external environment and the surge in the public investments compounded pressure on foreign reserves in 2015–2016. The authorities have since put an adjustment program in place to mitigate the risks of external imbalance by muting domestic absorption and easing the current account strains notwithstanding the temporary growth slowdown that may come from the fiscal restraint. The program has already helped reduce external imbalances in the first half of 2017. The proposed DPO will support the authorities, among others, in containing the fiscal risks that are likely to emerge from the energy sector over the medium term.

II. Operations Objective(s)

9. **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: (i) containing the fiscal impact of the electricity sector (Pillar A); and (ii) improving the operational efficiency, affordability, and accountability of electricity service (Pillar B).

III. Rationale for Bank Involvement

10. **Actions in the proposed series support implementation of the Government program and aim to define and put in place a consistent and incremental roadmap towards the sustainable development of the power sector in Rwanda**, by simultaneously addressing the three main challenges of the sector: lowering cost of electricity service delivery (while ensuring transition to a low-carbon energy mix), boosting revenues from electricity service delivery and enhancing affordability of low income consumers. A program of subsidy rationalization (Pillar A of this series) is accompanied by a sector reform program to ensure a multi-pronged approach to reducing cost and boosting revenues (Pillar B of this series). *First*, the Government is putting in place a fiscal framework for the electricity sector that balances Governments' sector expenditure priorities and fiscal sustainability objectives. *Second*, the Government is institutionalizing least-cost principles in procurement of new power plants, by moving from bilaterally negotiated investments to least cost sector planning and competitive procurement of capacity. *Third*, the Government is reforming its electrification program to make electricity access (both grid and off-grid) more affordable, including by leverage the private sector for mini-grids and off-grid solar. *Fourth*, the Government is taking measures—including the transition towards International Financial Reporting Standards (IFRS)-compliant accounting and commercial independence—to put in place the foundations for REG, that is in charge of electricity utility services provision, to tap into commercial financing for the sector expansion. *Fifth*, the Government aims to improve operational efficiency of REG. Key measures include improving resource management in the utility, systematic monitoring of quality of customers' commercial service and quality of electricity supply and independent performance audits of REG.

IV. Tentative financing

Source:	(\$m.)
BORROWER/RECIPIENT	0.00
International Development Association (IDA)	125.00
Borrower/Recipient	
IBRD	
Others (specify)	
Total	125.00

V. Tranches

11. **A single-tranche DPO of US\$125 million equivalent would be made available following approval and notification by IDA of financing effectiveness.** The proposed financing will follow the Bank's disbursement procedures for DPOs. The financing proceeds will be disbursed against satisfactory implementation of the development policy program and the maintenance of a satisfactory macroeconomic framework.

VI. Institutional and Implementation Arrangements

12. **The Recipient of the DPO is the Republic of Rwanda, represented by Ministry of**

Finance and Economic Planning (MINECOFIN).

13. **The Ministry of Infrastructure (MININFRA) is the main coordinating agency** for the program supported by this operation. The responsibility for implementation of the prior actions of this operation lies with MININFRA, the Rwanda Energy Group (REG) and its subsidiaries, as well as the Rwanda Utilities Regulatory Authority (RURA).

14. **A working group has been formed to monitor progress towards the prior actions, triggers, and results indicators.** As part of the Government of Rwanda's commitment to results-based policy, the program outcomes are being measured against the achievement of results indicators included in the policy and results matrix. Monitoring the progress towards the achievement of the Program's objectives lies under the responsibility of the line ministry, MININFRA, with support from REG and its subsidiaries.

VII. Risks and Risk Mitigation

15. **The overall risk rating for the project is Substantial.** The key risks and proposed mitigation measures are outlined in the paragraphs below.

16. **Political and Governance.** Governance of Rwanda's power sector has historically been highly concentrated in the Government, with relatively little independent decision making, for example, in the utility. This benefits reform coordination and can speed up program implementation. However, with limited separation of commercial, regulatory, and political objectives in decision making, it carries risks of inefficiencies and nonadherence to business plans or regulatory mandates. To mitigate such risks, the Government has taken steps to promote institutional independence, including by piloting competitive recruitment of key staff and senior managers of the sector institutions. Moreover, the Government has engaged RURA, an independent sector regulator with a track record of independent tariffs decisions and utility performance reviews, in the program development and implementation.

17. **Macroeconomic.** Weak growth, a currency devaluation, or increases in global energy prices, particularly oil, during the program period may make it more difficult for the Government to contain electricity subsidies as a percentage of GDP while maintaining public spending on access. Key risks to the growth are associated with weak external environment, regional tensions, and persisting external imbalances. In particular, weak global prices of minerals, coffee, and tea, if continued, will subdue production and exports, while delayed exchange rate adjustment may affect incentives to investment in the nascent nontraditional export sector and increase in oil prices would affect the cost of imports and consequently the running costs of fuel oil-operated peaking plants, thus putting upward pressures on sector budget transfers. The pace of structural transformation will largely depend on the extent of materialization of authorities' expectations behind the large-scale investment program in tourism and connectivity. Continued weak private sector response to the improved investment climate remains a key risk.

18. **Sector Strategies and Policies and Technical Design of Program.** This DPO series is unusual in that it does not address an immediate fiscal crisis but aims to support the Government in taking difficult, preventive measures to avoid one. The eventual shape of decisions taken to achieve the results indicators is less predictable during the preparation of this DPO than in more

traditional DPO series, and the language of the triggers was kept flexible to accommodate the Government's strategic choices made during program implementation. The associated risk is that the DPO series' results will be put in jeopardy if the Government cannot find consensus on adequate responses to the challenges of the sector, including through (a) suboptimal implementation of the Least Cost Power Development Plan (LCPDP), leading to increased cost of service; (b) suboptimal implementation of the grid-based electrification program, leading to lower than the targeted access rates; and (c) poor progress on utility performance. To mitigate these risks, the results indicators of this operation are outcome oriented, and MININFRA is committed to continuously monitoring progress of the LCPDP, electrification targets, access policies and regulations, and implementation of utility reforms. The Government's overall reform track record is widely recognized and gives confidence in the Government's ability to sustain implementation of programmatic reform efforts. Strong continuity of reforms was demonstrated, for instance, under three consecutive series of World Bank-supported DPOs in the social protection sector (a total of nine operations over 2009–2017).

19. **Institutional capacity for implementation and sustainability.** While institutional capacity to implement the program is reasonably high in Rwanda, the scope and ambition of the program could stretch this capacity, thus increasing implementation and sustainability risks of the operation. Given that the DPO is a part of a comprehensive World Bank program in Rwanda, this risk will be mitigated through using well-established dialogue avenues with the counterparts as well as extensive technical assistance (TA) support provided through ongoing investment projects. The experts and the local counterparts will (a) actively get involved in the implementation of the new systems; (b) set up systems to follow up on the information received through these systems, including performance benchmarking; and (c) prepare and implement a corporate strategic plan, including key business performance indicators aimed at promoting a performance-driven culture. The Government is expected to set up a Steering Committee to coordinate DPO 2 and DPO 3 implementation.

20. **Stakeholder risks.** The program outcomes critically depend on the Government's ability to find an agreement on adequate responses to the issues facing the sector with all relevant stakeholders. The core elements of the proposed program rest upon not just putting in place an adequate planning and decision-making framework but also on finding consensus among stakeholders, including development partners and private sector, on how to address fiscal risks. To mitigate stakeholder risk, the Government intends to use the existing system of public consultations in Rwanda: public discussions of the important policy documents through technical working groups and Energy Sector Working Group. The existing practice of public consultations have been proven critical in reaching consensus on sector reforms in Rwanda. It has been used for discussing outcomes of the LCPDP, enforcement of off-grid standards, and other prior actions under this operation.

21. **Climate risks.** Due to Rwanda's reliance on hydropower for a significant share of generation capacity (currently 45 percent), the short- and long-term sustainability of power supply, and thus the results of this DPO series, are exposed to climate risks. Over the past 30 years, Rwanda has experienced unusual irregularities in climate patterns, including variability in rainfall frequencies and intensity and persistence of extremes like heavy rainfall in the northern parts and drought in the eastern and southern parts. Without appropriate planning, these irregularities may affect the availability and reliability of hydropower supply and may increase

the need for costly fossil backup or emergency generation. Under this DPO series, the Government is putting in place appropriate planning procedures and creating a more secure energy mix by including complementary renewables and engaging in regional trades—thus mitigating climate risks.

VIII. Poverty and Social Impacts and Environment Aspects

22. **Despite Rwanda’s achievements in electrification in the past decade, the electrification rate primarily reflects grid-connected users in urban areas and remains largely concentrated in the two top quintiles, with almost negligible coverage in the bottom 40 percent of the population.** Electrification is primarily a rural challenge: 77 percent of urban population is electrified, and their access is concentrated in higher access tiers (corresponding to higher levels of service). By contrast, the 84 percent of the rural population has no access to electricity (Tier 0¹), and only very few are in the top tiers. There are more rural households in Tiers 1 and 2 than urban households, given that off-grid solutions, providing Tier 1-2 service, are more common in rural areas. Off-grid access to electricity holds potential to benefit rural households in particular but is low throughout the country and is mostly concentrated in rural areas.

23. **Expanding electricity access is expected to have significant positive impacts on households’ social and economic wellbeing, which have been demonstrated for Rwanda’s electrification program by a recent impact evaluation of grid-based electrification.** Findings from a survey-based analysis show significant difference between treatment and control villages on several socioeconomic indicators of the population. For instance, the percentage of people who moved from agricultural to non-agriculture; the percentage of permanent material for house walls; the percentage of people offering or benefiting trainings on income generating activities; opinions on women and children’s rights; and the percentage of women who indicated that they can make their own decisions, which significantly increased from 44 percent in control to 51 percent in treatment villages. The impact is found to have come through increased income and consumption spending, quality and value of houses, asset creation, which could be interpreted as an improvement in wellbeing. Also, the impact of electricity has decreased the household monthly energy expenditure (excluding electricity), biomass collection costs and time, and non-biomass energy costs - this would mean that households used electricity as a substitute to biomass and non-biomass energy needs, especially for lighting. Access to electricity impacts also positively on increasing the number of hours worked per day. It impacts, as well, on education of children (number of hours studied at home per day after sunset for schooling children) and time use for tutoring children.

24. **The promotion of off-grid solutions for rural households under the series will make it more affordable for them to reach the lower Tiers of the access ladder.** Rwanda is a small, densely populated country that will ultimately be fully electrified through the national grid. However, grid connections are still relatively expensive for many households. Off-grid solutions, which provide lower-tier service but are more affordable, can provide an important interim

¹ Access Tiers are defined under the SE4ALL Multi-Tier Framework (MTF). Under the MTF, Tier 1 (minimum 12 kWh per day) is defined as providing access up to four hours per day and at least one hour at night and can be used for basic applications such as task lighting, radio, and phone charging (<http://trackingenergy4all.worldbank.org>).

solution for these households. The Government's measures to strengthen the off-grid solar market aim to reduce barriers to adoption of off-grid solar solutions.

25. **The tariff revision to introduce a lifeline tariff and the new connection policy that eliminates high upfront connection fee will make on-grid electricity more affordable for the poor and the bottom 40 percent.** World Bank staff estimates suggest that, at the tariff prevailing until January 2017, the affordability threshold was near the 70th income percentile (i.e., electricity is affordable for the top 30 percent and unaffordable for the lowest 70 percent). Electricity becomes even less affordable for households that only recently gained access to the grid and must pay off their contribution to the connection fee. Two new measures taken by the Government aim to address this situation and make electricity more affordable for lower-income households. First, the tariff revision in January 2017 reduced the cost of electricity by 51 percent for household with monthly consumption up to 15 kWh (the average monthly consumption of households in Rwanda was an estimated 70 kWh per month in 2016/17). Second, the new connection policy aims to make connections affordable for all consumer categories and introduces new payment options for the connection fee, including one with zero down payment targeted at low-income households. Both measures are expected to have significant, positive poverty and distributional effects.

26. **Gender.** Providing households, social institutions, and enterprises with new energy access and improved energy services has the potential to promote gender equality, create employment and business opportunities for women, and improve development outcomes with regard to income generation and maternal health. For example, electrification can significantly reduce women's drudgery and save them time, particularly in female-dominated labor-intensive agricultural and food processing activities through uptake of electrical appliances, such as water pumps, grinders, mills, and refrigeration. The provision of electric light further amplifies time savings through increased efficiency, added flexibility in the scheduling of household tasks, and an increased sense of safety and security. Moreover, electrification and improved affordability of electricity have the potential to improve equality and women's socioeconomic status, specifically of those engaged in manual labor or time intensive activities that can benefit from mechanization. Further positive impacts include improved indoor air quality, which leads to better health outcomes especially for women and children, as well as improved access to IT and communications for the household, which has the potential to shift norms and increase women's agency.

10. **Citizens' engagement.** REG is a leader among its peers in Sub-Saharan Africa when it comes to direct interaction with, and accountability to, consumers and citizens. It has a strong and responsive presence on social media and provides consumers with various modes of communication for feedback. It has abolished any form of cash payment for its services to root out corruption and provides citizens with SMS and WhatsApp numbers to report any deviation from that practice. Implementation and publication of annual customer satisfaction surveys and digitalization of performance monitoring, as envisioned under this program, will further enhance the utility's accountability to consumers. On the technical side, REG's newly adopted integrated business management system (IBMS) will support the processes and activities for effective and fast attention as well as resolution of customers' complaints related to outages and other incidents affecting the quality of electricity supply.

27. **The specific policies supported by the DPO series are not expected to have significant negative effects on Rwanda’s environment, forests, water resources, habitats or other natural resources.** The risk of unanticipated adverse effects to the environment is modest. Rwanda has in place adequate environmental controls and legislation under the mandate of Rwanda Environment Management Authority (REMA), providing support to line ministries including MININFRA in incorporating environmental guidelines in the operational manual for its programs. Also, the World Bank is supporting REMA with technical assistance to take into account climate risks and opportunities and with land policy technical assistance to review sustainable land management practices.

28. **Net positive environmental effects are expected from improved sector planning, the new tariff structure and reduced system losses.** Improved planning is expected to improve the utilization of low-cost hydropower and regional electricity exchanges in the energy mix and reduce the need for expensive and polluting fossil fuel capacity. The time-of-use incentives and demand charges for large consumers are expected to smoothen their demand profile. This is expected to reduce the need for diesel and fuel oil-operated peaking plants and increase utilization of baseload hydropower plants. Reduced commercial losses reduction will mitigate greenhouse gas and pollutant emissions by reducing demand for power generation.

29. **Greening the energy sector is a core element of Rwanda’s Nationally Determined Contribution (NDC) under the Paris Agreement, and the Program supports all three NDC priority mitigation actions in the power sector.** Rwanda’s NDC prioritizes (i) increasing the share of new grid connected renewable capacity compared to fossil fuels; (ii) the installation of solar PV in rural communities; and increases in energy efficiency through demand-side measures and grid-loss reduction. The fourth NDC priority action in energy relates to biofuels and is therefore outside of the scope of this DPO series.

IX. Contact point

World Bank

Contact: Yadviga Semikolenova

Title: Senior Energy Economist

Tel: +1-202-473-7631

Email: ysemikolenova@worldbank.org

Borrower

Contact: Ronald Nkusi

Title: Division Manager, External Finance Division, Ministry of Finance and Economic Planning

Tel: +250-252596130

Email: Ronald.nkusi@minecofin.gov.rw

X. For more information contact:

The InfoShop
The World Bank
1818 H Street, NW

Washington, D.C. 20433

Telephone: (202) 458-4500

Fax: (202) 522-1500

Web: <http://www.worldbank.org/infoshop>