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INTERNATIONAL DEVELOPMENT ASSOCIATION

PROGRAM DOCUMENT

FOR A

PROPOSED CREDIT

IN THE AMOUNT OF SDR 88.5 MILLION
(US\$125 MILLION EQUIVALENT)

TO

THE REPUBLIC OF RWANDA

FOR A

FIRST PROGRAMMATIC ENERGY SECTOR DEVELOPMENT POLICY FINANCING

November 2, 2017

Energy and Extractives Global Practice
Africa Region

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THE REPUBLIC OF RWANDA - GOVERNMENT FISCAL YEAR

July 1 – June 30

CURRENCY EQUIVALENTS

(Exchange Rate Effective as of September 30, 2017)

Currency Unit = Rwandan franc (RWF)

US\$1 = RWF 832.72

US\$1 = SDR 0.70756

ABBREVIATIONS AND ACRONYMS

AfDB	African Development Bank
BNR	National Bank of Rwanda
BTC	Belgian Technical Cooperation
CEO	Chief Executive Officer
CFO	Chief Financial Officer
CMS	Commercial Management System
CPIA	Country Policy and Institutional Assessment
DPO	Development Policy Operation
DSA	Debt Sustainability Analysis
EARP	Electricity Access Rollout Program
EASSDP	Rwanda Electricity Access Scale-up and Sector Wide Approach Development Project
EDCL	Energy Development Corporation Limited
EDPRS-II	Second Economic Development and Poverty Reduction Strategy
EDPRS-III	Third Economic Development and Poverty Reduction Strategy
EICV 4	Integrated Household Living Conditions Survey
ERR	Efficient Revenue Requirement
ESMAP	Energy Sector Management Assistance Program
EU	European Union
EUCL	Energy Utility Corporation Limited
EWSA	Electricity, Water, and Sanitation Authority
FY	Fiscal Year
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GRS	Grievance Redress Service
HR	Human Resources
IBMS	Integrated Business Management System
IDA	International Development Association
IEG	Independent Evaluation Group
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IRMS	Incident Recording and Management System
IT	Information Technology
KCC	Kigali Convention Center
kWh	Kilowatt hour

LCPDP	Least-cost Power Development Plan
MINECOFIN	Ministry of Finance and Economic Planning
MININFRA	Ministry of Infrastructure
MIS	Management Information System
MTF	Multi-Tier Framework
MW	Megawatts
NDC	Nationally Determined Contribution
NEP	National Electrification Plan
NISR	National Institute of Statistics of Rwanda
PDO	Program Development Objective
PFM	Public Financial Management
PPP	Public-Private Partnership
PSI	Policy Support Instrument
PV	Photovoltaic
RDB	Rwanda Development Board
REG	Rwanda Energy Group
REMA	Rwanda Environment Management Authority
RES	Rural Electrification Strategy
RESSP	Rwanda Electricity Sector Strengthening Project
RPP	Revenue Protection Program
RR	Revenue Requirement
RSB	Rwanda Standards Board
RURA	Rwanda Utilities Regulatory Authority
SE4ALL	Sustainable Energy for All
SAIDI	System Average Interruption Duration Index
SCF	Standby Credit Facility
SDR	Special Drawing Rights
SID	Strategic Investment Department of RDB
SP	Social Protection
SWap	Sectorwide Approach
TA	Technical Assistance
VUP	Vision 2020 Umurenge Program

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THE REPUBLIC OF RWANDA

FIRST PROGRAMMATIC ENERGY SECTOR DEVELOPMENT POLICY FINANCING

TABLE OF CONTENTS

SUMMARY OF PROPOSED CREDIT AND PROGRAM.....	1
1. INTRODUCTION AND COUNTRY CONTEXT (INCLUDING POVERTY DEVELOPMENTS).....	1
2. MACROECONOMIC POLICY FRAMEWORK.....	7
2.1 RECENT ECONOMIC DEVELOPMENTS.....	7
2.2 MACROECONOMIC OUTLOOK AND DEBT SUSTAINABILITY.....	11
2.3 IMF RELATIONS.....	12
3. THE GOVERNMENT’S PROGRAM	13
4. THE PROPOSED OPERATION	16
4.1 LINK TO GOVERNMENT PROGRAM AND OPERATION DESCRIPTION.....	16
4.2 PRIOR ACTIONS, RESULTS, AND ANALYTICAL UNDERPINNINGS.....	18
4.3 LINK TO CPF, OTHER WORLD BANK OPERATIONS, AND THE WORLD BANK GROUP STRATEGY	35
4.4 CONSULTATIONS AND COLLABORATION WITH DEVELOPMENT PARTNERS	36
5. OTHER DESIGN AND APPRAISAL ISSUES.....	37
5.1 POVERTY AND SOCIAL IMPACT	37
5.2 ENVIRONMENTAL ASPECTS.....	40
5.3 PFM, DISBURSEMENT, AND AUDITING ASPECTS.....	41
5.4 MONITORING, EVALUATION, AND ACCOUNTABILITY	43
6. SUMMARY OF RISKS AND MITIGATION	44
ANNEX 1: POLICY AND RESULTS MATRIX.....	47
ANNEX 2: LETTER OF DEVELOPMENT POLICY.....	52
ANNEX 3: IMF RELATIONS ANNEX	59
ANNEX 4: ENVIRONMENT AND POVERTY/SOCIAL ANALYSIS TABLE	63
ANNEX 5: DEBT SUSTAINABILITY ANALYSIS	66
ANNEX 6: LINK OF THE FIRST PROGRAMMATIC ENERGY SECTOR DEVELOPMENT POLICY OPERATION TO RWANDA’S NATIONALLY DETERMINED CONTRIBUTION UNDER THE PARIS AGREEMENT	74

FIGURES

Figure 1. Rwanda’s Recent Progress in Electricity Access, Installed Generation Capacity (2008–2017), and Government Targets, which Are Currently Undergoing Revisions	3
Figure 2. Electricity Tariffs in Rwanda in Comparison to Other Countries in Sub-Saharan Africa	4
Figure 3. Schematic Representation of the Link between DPO Pillars and Expected Outcomes	6
Figure 4. Cost of Electricity Service and Sales Revenues according to REG’s Consolidated Financial Results FY2015/16	19
Figure 5. Budget Transfers to Electricity Averaged 1.96 percent of GDP over FY2015–2017, Crowding out Spending on Human Development	20
Figure 6. Financing Sources for Public Investment in Electricity in Rwanda (2000–2013)	29
Figure 7. Electricity Access for Urban and Rural Households, by Tier	38
Figure 8. Total Share of Households with Access (Tiers 1–5), Split by Technology	38

TABLES

Table 1. Selected Economic Indicators	9
Table 2. Fiscal Accounts (percentage of GDP)	10
Table 3. External Financing Requirements and Sources (% of GDP).....	11
Table 4. Results Indicator of Pillar A	21
Table 5. Results Indicators of Pillar B.1	24
Table 6. Results Indicators of Pillar B.2	28
Table 7. Results Indicator of Pillar B.3	30
Table 8. Results Indicators of Pillar B.4	32
Table 9. DPO Prior Actions and Analytical Underpinnings.....	33
Table 10. Summary Risk Ratings	46

The DPO was prepared by an IDA team led by Yadviga Semikolenova (Senior Energy Economist and Task Team Leader) and including Norah Kipwola (Senior Energy Specialist), Joern Huenteler (Young Professional), Pedro Antmann (Lead Energy Specialist), Lara Born (Energy Specialist), Federico Querio (Energy Specialist), Aghassi Mkrtyan (Senior Economist), Inka Schomer (Operations Officer), Ali Ouattara (Senior Financial Specialist), Vivien Foster (Lead Economist), Enagnon Ernest Eric Adda (Senior Financial Management Specialist), Nagaraju Duthaluri (Lead Procurement Specialist), Mary Bitekerezo (Senior Social Development Specialist), Edward Dwumfour (Senior Environmental Specialist), Sofia Ferreira (Senior Counsel), Marie Louise Feliciteq Soue (Program Assistant), and Sylvie Ingabire (Program Assistant). Husam Beides (Lead Energy Specialist), Ani Balabanyan (Lead Energy Specialist), Erik Fernstrom (Practice Manager), Malcolm Cosgrove (Lead Energy Specialist), Paivi Koljonen (Lead Energy Specialist), Sheoli Pargal (Lead Energy Specialist) and Dana Rysankova (Senior Energy Specialist) served as peer reviewers.

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SUMMARY OF PROPOSED CREDIT AND PROGRAM

THE REPUBLIC OF RWANDA

FIRST PROGRAMMATIC ENERGY SECTOR DEVELOPMENT POLICY FINANCING

Borrower	The Republic of Rwanda
Implementation Agency	Ministry of Finance and Economic Planning (MINECOFIN) and Ministry of Infrastructure (MININFRA)
Financing Data	SDR 88.5 million (US\$125 million equivalent) on IDA Credit terms (38-year maturity and 6-year grace period)
Operation Type	First operation of a programmatic series of three consecutive Development Policy Operations (DPOs)
Pillars of the Operation and Program Development Objectives	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.
Results Indicators	<ul style="list-style-type: none"> • Results Indicator A1: Contain electricity subsidies as percentage of GDP. Baseline (FY 2016/17): 1.4% of GDP. Target (FY2019/20): Not more than 1.4% of GDP. • Results Indicator B1: 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. Baseline (September 2017): No. Target (December 2020): Yes. • Results Indicator B2: Initiate competitive procurement processes to implement investments identified in the LCPDP. Baseline (September 2017): 0. Target (December 2020): At least 1. • Results Indicator B3: Expand electrification rate countrywide (percentage of households). Baseline (June 2017): 40.7%. Target (December 2020): 55%. • Results Indicator B4: Expand electrification rate among rural households (percentage of households). Baseline (June 2017): 16%. Target (December 2020): target values to be determined during preparation of DPO 2, using results of the National Electrification Plan. • Results Indicator B5: Ensure REG's financial statements are in full compliance with IFRS, their independent audit is without qualifications, and they are published within the first two quarters of the following year and distributed to key stakeholders. Baseline (September 2017): No. Target (December 2020): Yes. • Results Indicator B6: Reduce commercial losses as a percentage of electricity supply. Baseline (2013): 11.95%. Target (2020): 8.95.0%. • Results Indicator B7: Reduce average duration of interruptions (System Average Interruption Duration Index [SAIDI]). Baseline and target values to be determined during preparation of DPO 2, using new monitoring data on quality of service. • Results Indicator B8: Implement and publish annual customer satisfaction survey. Baseline (2017): No. Target (2020): Yes.
Overall Risk Rating	Substantial
Climate and Disaster Risks	(i) Are there short and long-term climate and disaster risks relevant to the operation (as identified as part of the SORT environmental and social risk rating)? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If yes, (ii) summarize briefly these risks in the risk section and what resilience measures may help address them? Such risks are expected to be modest; see summary in risk section.
Operation ID	P162671

IDA PROGRAM DOCUMENT FOR A PROPOSED

CREDIT

TO THE REPUBLIC OF RWANDA

1. INTRODUCTION AND COUNTRY CONTEXT (INCLUDING POVERTY DEVELOPMENTS)

1. **The proposed Energy Sector Development Policy Loan in the amount of SDR 88.5 million (equivalent to US\$125 million) is the first in a programmatic series of three Development Policy Operations (DPOs).** The Government's reform program aims at balancing the triple objectives of achieving ambitious expansion targets for electricity generation and access while containing fiscal transfers to the sector and enhancing the affordability of electricity service for consumers. In line with the Government's program, 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.

2. **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 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 (SP) sector (a total of nine operations over 2009–2017). The Government delivered on the agreed program and implemented deep SP reforms that established a good practice SP program (the Vision 2020 Umurenge Program [VUP], which covers about 300,000 households) and institutionalized efficiency, accountability, and transparency throughout the SP system. Moreover, 100 percent of Rwanda's World Bank projects completed in 2011–2016 have been rated Moderately Satisfactory and above by the World Bank's Independent Evaluation Group (IEG).¹

3. **Rwanda's Vision 2020 aims to lift the country to middle-income status and prioritizes delivery of sustainable, affordable, and reliable electricity services to achieve its ambitious development vision.** Rwanda's Vision 2020 is being implemented through a series of medium-term (five-year) strategic plans that define development targets nationwide and for each sector. The current five-year plan (FY2013/14–FY2017/18) is the second Economic Development and Poverty Reduction Strategy (EDPRS-II), which was launched in July 2013. EDPRS-II aims to accelerate progress to lower-middle-income status and better quality of life for all Rwandese through sustained average GDP growth of 11.5 percent and accelerated reduction of poverty to less than 30 percent. For the electricity sector, Vision 2020 identifies the expansion of the electricity sector as critical for sustaining economic growth and transforming Rwanda's economy as it transitions from subsistence agriculture to more energy-intensive industrial and service activities.

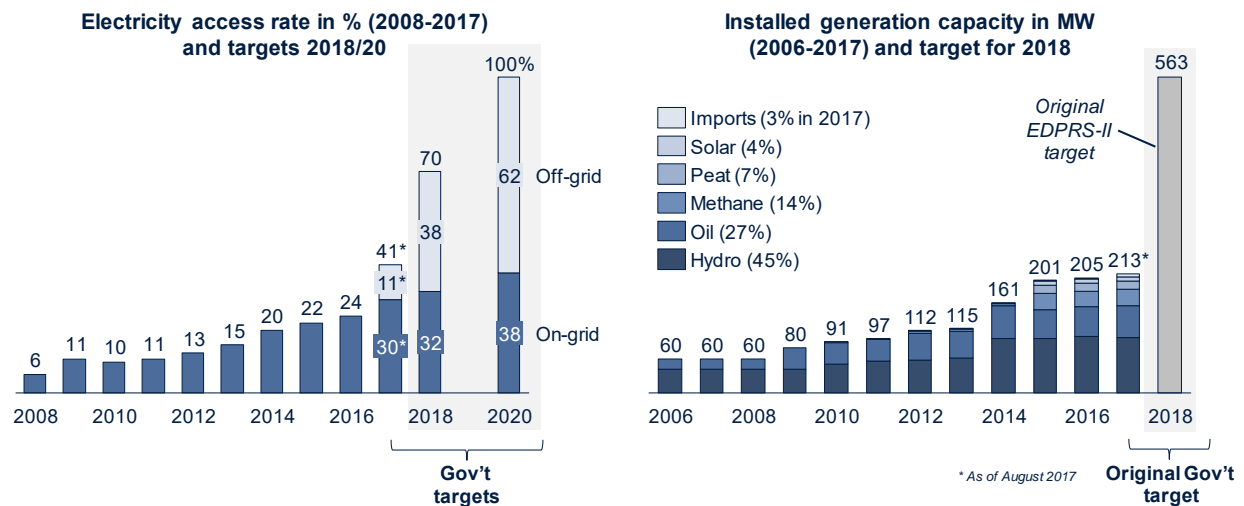
¹ <http://ieg.worldbankgroup.org/data>.

4. **Rwanda’s Vision 2020 is aligned with the global momentum on Sustainable Development Goals and Sustainable Energy for all.** The international community has coalesced around energy access, energy efficiency, and renewable energy objectives collaborating with countries to support their national aspirations of universal access to energy services and clean energy transition. Rwanda has set the ambitious target of reaching a universal basic level of access to electricity (Tier 1)² by 2020. To that end, EDPRS-II set targets of increasing electricity generation capacity to 563 Megawatts (MW) and expanding access to electricity to 70 percent of households by 2018. EDPRS-II anticipated the investment needed to achieve these targets over the five-year period at US\$3.2 billion, over a third of the total estimated investment to achieve EDPRS-II targets across all sectors. Currently, the Government is preparing a National Strategy for Transformation for the period 2017–2024, where it evaluates achievements of the targets and course-corrects as necessary.

5. **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 (see Section 3), 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.

² The Government’s targets refer to the tiers defined under the Sustainable Energy for All (SE4ALL) Multi-Tier Framework (MTF); see Section 3 for details. 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>).

Figure 1. Rwanda’s Recent Progress in Electricity Access, Installed Generation Capacity (2008–2017), and Government Targets, which Are Currently Undergoing Revisions



Source: Ministry of Infrastructure (MININFRA), Rwanda Energy Group (REG).

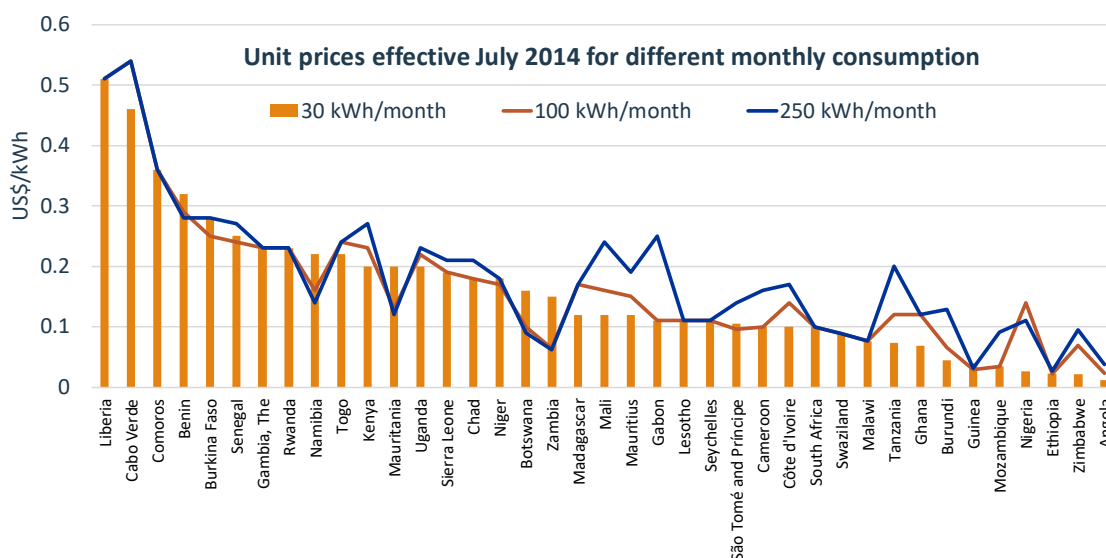
6. **Improvements in sector outcomes, especially enhanced electricity access, are having a measurable impact on household welfare.** A recent impact evaluation of the World Bank’s access investments in Rwanda³ found increased income and consumption spending, quality and value of houses, and asset creation. Electrification was also found to decrease household monthly energy expenditure (excluding electricity) and biomass collection costs and time and increase time spent on education by children and time used for tutoring children.

7. **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 the 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. Finally, most contracts to develop capacity were procured through bilaterally negotiated deals rather than competitive procurement. Taken together, these decisions led to excessively high unit costs (around US\$0.32 per Kilowatt hour (kWh) in FY2016/17). The resulting high tariffs (US\$0.20 per kWh on average) 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.

³ ‘Impact Evaluation of the Rwanda Electricity Access Rollout Program (EARP) and Sectorwide Approach (SWAp) Development Project’, conducted by REG with the support of the World Bank, is a part of the World Bank’s corporate commitments in IDA17. The baseline survey was completed in 2014 and the follow-up survey was conducted in 2016. The report provides unprecedented information on the use of energy and its impact on socioeconomic welfare.

Doing Business indicators report high electricity costs being a major obstacle to the realization of private investments promoted by the advanced economic reforms designed to set up an attractive enabling environment.⁴ Rwandan firms lose out on competitive advantage. Relatively larger firms, including manufacturing, report electricity as a binding constraint, an important consideration as they are most likely to create jobs, export, attract investments, and thus drive growth. A recent study, ‘Making Power Affordable for Africa and Viable for its Utilities’, notes that Rwanda’s cost of service is among the top 10 in Sub-Saharan Africa and the revenue gap, in spite of high tariffs, is also among the top 10—highlighting the challenge of fiscal sustainability of Rwanda’s electricity service delivery. The possibility of recouping the cost of electricity service delivery from consumers is also rather limited. A subsistence level of electricity (30 kWh per month) is unaffordable for more than three-quarters of the unelectrified population (comparable only to Burkina Faso and Madagascar).⁵

Figure 2. Electricity Tariffs in Rwanda in Comparison to Other Countries in Sub-Saharan Africa



Source: Kojima et al., 2016.

8. **Caught between the high cost of electricity and limited affordability, the Government has stepped in to fill the gap between sector cost and revenues, exposing the budget to fiscal risks.** The Government’s efforts to meet its ambitious capacity expansion and electricity access targets (see Figure 1) are putting financial strain on the sector. The gap between the cost and revenue per unit of electricity (kWh) could increase from US\$0.12 to over US\$0.30 by 2020, as a number of expensive capital-intensive fossil fuel power plants are scheduled to come online, leading to a potentially significant increase in the

⁴ While Doing Business in Rwanda 2017 shows significant improvements in the business enabling environment in the country (for example, Rwanda is now ranked 76 in starting a business, compared to 109 in 2016, and 95 in enforcing contracts, compared to 117 in 2016); it remains at 117 (out of 190) in getting electricity, with one of the highest electricity tariffs in the region. <http://www.doingbusiness.org/data/exploreeconomies/rwanda#getting-electricity>.

⁵ Kojima, Masami, Chris Trimble, Xin Zhou, Jace Jeusun Han, Joeri de Wit, and Robert Bacon. 2016. “Who Uses Electricity in Sub-Saharan Africa? Findings from Household Surveys.” World Bank Policy Research Working Paper. <https://openknowledge.worldbank.org/bitstream/handle/10986/25029/Who0uses0elect0om0household0surveys.pdf?sequence=1&isAllowed=y>.

utility's revenue requirement (RR). Under a business-as-usual scenario, electricity subsidies,⁶ budgeted at 1.4 percent of GDP in FY2017/18,⁷ may rise to over 4 percent of GDP in 2020, according to preliminary results of the draft Least-cost Power Development Plan (LCPDP) commissioned by the Government. Thus, without urgent measures, high sector costs may make the expansion of electricity services fiscally unaffordable.

9. **The counterfactual to this series is a substantially larger financial gap in the electricity sector under a business-as-usual scenario, undermining the fundamentals of the sector, crowding out public spending on other priority areas, and imposing a major risk for medium- and long-term fiscal sustainability and macroeconomic stability in Rwanda in general.** Fiscal sustainability has become even more important in the context of the recent increase in Rwanda's public and publicly guaranteed debt, and lower growth and revenue projections for the medium term because of the recent growth slowdown. In a scenario with no major reforms, the additional fiscal transfers to the electricity sector of about 3 percent of GDP (on top of the current subsidies of 1.4 percent) would have major implications on the Government's ability to allocate fiscal resources for other important development needs and will undermine the overall fiscal and debt sustainability. To mitigate such a scenario, the reforms supported by this operation will help achieve a sustainable trajectory for sectors' financial needs, by containing the fiscal transfers at 1.4 percent of GDP in 2020 and maintaining that level over the long term.

10. **To proactively address the fiscal risks from the electricity sector, the Government has requested this DPO series to support a program that includes measures to respond to the urgency of the situation but also lay the foundation for a sustainable sector capable of providing reliable and affordable energy services.** This short- to medium-term reform program is underpinned by the principles of least-cost planning, competition, accountability, and operational efficiency and consists of the following main elements:

- (a) Putting in place a fiscal policy for the electricity sector that balances the Government's sector expenditure priorities and fiscal sustainability objectives (supported under Pillar A of this DPO series; see Figure 3)
- (b) Institutionalizing least-cost principles in the scheduling and procurement of new power plants, including in the short term, by moving from ad hoc, bilaterally negotiated investments to adoption of least-cost sector planning and competitive procurement, as well as including strengthened regional electricity trade in least-cost planning (Pillar B.1)
- (c) Promoting the transition to low carbon energy by reforming the legal framework for renewable energy generation and developing grid-connected hydropower and solar power (Pillar B.1), and by removing barriers for off-grid solar energy (Pillar B.2)
- (d) Reforming its electrification program to make electricity access more affordable, including by leveraging the private sector for mini-grids and off-grid solar (Pillar B.2)
- (e) Taking measures—including the transition to International Financial Reporting Standards (IFRS)-compliant accounting and commercial independence—to improve transparency of

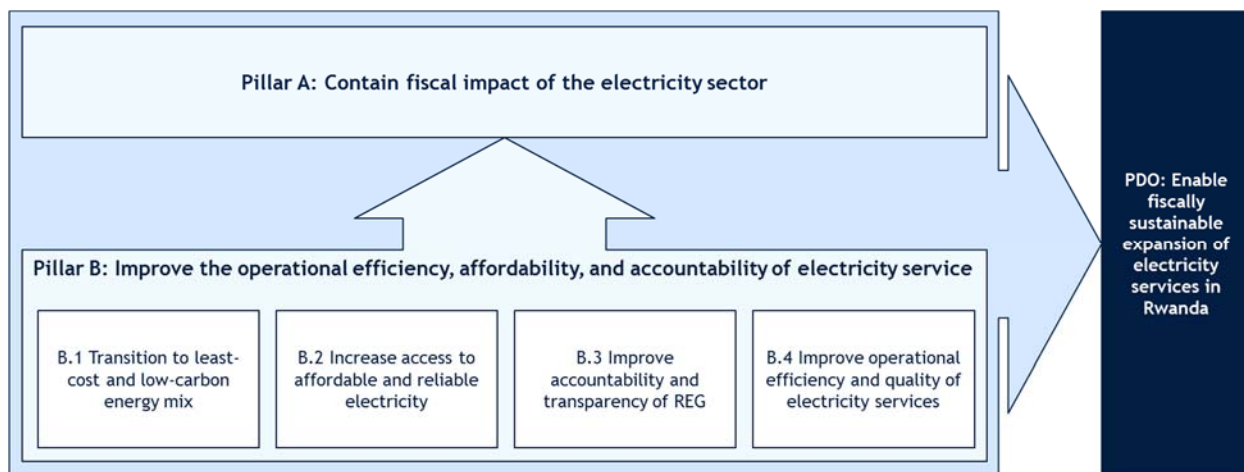
⁶ Electricity subsidies are defined in this program as budget transfers to the electricity sector, including transfers for investment (from the Development Budget of the Ministry of Finance and Economic Planning [MINECOFIN]) and to cover operational cost (Recurrent Budget).

⁷ Estimates of fiscal transfers are based on the results of a recent sector audit commissioned by the Government.

fiscal impacts and enable REG, which is in charge of electricity utility services provision, to tap commercial financing for sector expansion, and become a financially viable offtaker (Pillar B.3)

- (f) Improving operational efficiency of REG, through strengthened resource management in the utility, systematic monitoring of quality of customers' commercial service and quality of electricity supply, and independent performance evaluation of REG (Pillar B.4)

Figure 3. Schematic Representation of the Link between DPO Pillars and Expected Outcomes



11. **The proposed programmatic DPO series boosts Rwanda’s priority mitigation actions under its Nationally Determined Contribution (NDC) to the Paris Agreement (see Annex 6 for details).** The DPO series supports all three climate change mitigation actions in the power sector prioritized in Rwanda’s NDC: (a) increasing the share of new grid connected renewable capacity compared to fossil fuels; (b) installing solar photovoltaic (PV) mini-grids in rural communities; and (c) increasing energy efficiency through demand-side measures and grid-loss reduction. The adoption and effective implementation of the LCPDP will reduce greenhouse gas (GHG) emissions from the power sector by increasing the share of low-cost renewable energy sources compared to fossil fuels. As detailed in Annex 6, the lowest-cost LCPDP scenario increases the share of renewables in Rwanda energy mix to 59 percent by 2030, compared to 45 percent under counterfactual, business-as-usual scenario (an increase by a third) and reduces emissions by 560,000 tCO_{2eq} per year by 2030 compared to the business-as-usual scenario (a 44 percent reduction). Further, measures to strengthen the off-grid solar market under this operation will reduce barriers to the adoption of off-grid solar solutions, thereby expanding access through renewable energy rather than grid-based electricity.

12. **By shifting the Government’s focus sustainable service delivery, the proposed programmatic DPO series is transformative to how the sector will deliver its mandate.** The DPO series represents the World Bank’s first lending engagement solely focusing on electricity sector reforms in Rwanda and marks an important shift in the Government’s approach to the sector. The preparation of the DPO series has been instrumental in facilitating dialogue and coordination on a policy level between the Ministry of Finance and Economic Planning (MINECOFIN) and MININFRA on sector policy, which was previously mainly the domain of the line ministry. After years of prioritizing investment and expansion, the Government is willing to take bold measures to rein in costs and improve efficiency, and this represents an important change from business-as-usual. The programmed reforms, including competitive procurement of

investments, strict adherence to least-cost sector expansion planning, geospatially optimized access planning, and fully digitalized performance monitoring and optimization, will turn REG into one of the most advanced utilities in Sub-Saharan Africa. The reform program supported by this operation will further strengthen the role of the private sector in the power sector, which already owns and manages over half of the 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 offtaker of private generation (REG), the proposed operation is maximizing the benefits of private and public investment for the development of the sector.

13. **The reforms envisaged in this DPO are transformational in nature but builds on Rwanda’s past successes and will promote a fiscally sustainable energy sector in the short to medium term.** In 2013, with the support of the World Bank and other development partners, the Government restructured the key energy sector institutions, aiming at achieving regulatory independence, financial sustainability, and increased private sector engagement. REG was created to take over the electricity utility functions as well as carry out power sector planning and development. While the Government retains ownership of REG, its affiliated companies are governed under company law as opposed to public service law. Subsequent support focused on enhancing REG’s operational efficiency and governance. The scope of this DPO series is broader in nature and aims to consolidate reforms achievements to date as well as enhance the sector’s ability to scale up reliable, affordable, and sustainable service delivery.

14. **The Government is strongly committed to contain the fiscal impact of the electricity sector without slowing down its access program or compromising on consumer affordability, by reducing cost of service and losses as well as enhancing transparency.** The results indicators of this DPO series cover the most important key performance indicators: electricity subsidies, access, transparency, and efficiency. The DPO series aims to contain electricity subsidies at 1.4 percent of GDP in FY2019/20, without slowing down its access program and achieving its target of 38 percent on-grid access by FY2019/20. To ensure that cost and subsidies are handled in a transparent manner, the Government is committed to transition REG to fully IFRS-compliant financial statements and institutionalize their timely auditing and publication. The proposed DPO will also enhance the affordability to electricity services for the bottom 40 percent of the population.

2. MACROECONOMIC POLICY FRAMEWORK

2.1 RECENT ECONOMIC DEVELOPMENTS

15. **Economic growth slowed down from 8.9 percent in 2015 to 5.9 percent in 2016 and further to 4.2 percent (annualized) in the first quarter of 2017.** The surge in public investment funded by foreign savings helped sustain high growth in 2014 and 2015, but the economy began slowing down after large projects were completed and fiscal policy was tightened to address growing external imbalances. Although the slowdown is largely driven by temporary factors such as drought, weak export prices, and fiscal restraint to address growing external imbalances, deeper issues with productivity may be at play over the medium term, evidenced by lower total factor productivity growth in the recent years.

16. **The growth slowdown has been broad based, spanning all key sectors.** Agriculture, which accounts for nearly 30 percent of GDP, grew by only 2.6 percent in annualized terms as of the first quarter of 2017, down from 3.9 percent in 2016. Growth in the industrial activities slowed to from 6.7 percent in 2016 to 3.9 percent as of the first quarter in annualized terms reflecting weak performance in construction

activities following completion of large infrastructure projects. Growth in services slowed to 6 percent (in annualized terms as of the first quarter of 2017) from 7.1 percent in 2016 against the background of weakened consumer demand. On the demand side, consumption growth in annualized terms was only 3.5 percent as of the first quarter in 2017, while fixed investments were down by 0.6 percent. Household consumption grew by 2.6 percent only in the first quarter of 2017 in annualized terms, which is the lowest growth rate since 2008. Sizable exchange rate depreciation and a recovery in export prices positively contributed to the net exports and the GDP growth in the first growth of 2017.

17. **Rwanda experienced inflationary pressures from multiple sources in 2016 and 2017.** The supply shock from the drought that affected East Africa and the Horn was the main factor, while the pass-through from exchange rate depreciation also played a role. Inflation, historically at low single digits, increased to 7.3 percent at the end of 2016, further climbing to 8.1 percent in February 2017 (in annualized terms) before slowing down to less than 4 percent in August 2017 (annualized). Food prices that grew by double digits were the main drivers of high inflation registered in Rwanda between July 2016 and May 2017. Rural areas were more vulnerable to price pressures than urban areas because of a larger share of food items in the consumption basket.

18. **As a part of the policy adjustment program, the fiscal deficit was brought down to below 3.8 percent of GDP in 2016.** Fiscal restraint underpinned the authorities' goal of addressing the external imbalance, through greater exchange rate flexibility and stable foreign exchange reserves. In addition to the temporary fiscal restraint, the overall fiscal stance has tightened in recent years because of a gradual decline in external grants. Public investments funded by foreign grants declined from a peak of 8 percent of GDP in 2013 to 4 percent of GDP in 2016. As foreign grants have fallen, the fiscal deficit, excluding grants, has also narrowed sharply from 14.7 percent in 2013 to 9.6 percent projected for 2017. The fall in foreign grants further constrains Rwanda's public investment-driven growth model that was already under pressure due to rising public debt and slower productivity growth. Overall, the fiscal stance will be slightly more expansionary in 2017, but the fiscal deficit is expected to remain below 4.5 percent of GDP in the medium term as part of Rwanda's prudent approach to debt sustainability.

19. **Total public expenditures have declined by 2.7 percentage points of GDP during the past two years.** The decline was mostly driven by capital expenditure, which fell from 13 percent of GDP in 2015 to 10.6 percent in 2016. Total expenditures on health, education, and SP remained relatively stable (an estimated 8 percent of GDP in FY2016/17 versus 8.6 percent in FY2014/15). Public expenditures on education increased by 0.4 percentage points in GDP in that period, while health expenditures declined by 0.8 percentage points of GDP, mostly driven by the decline in the capital expenditures. SP expenditures remained relatively stable as a percentage of GDP.

Table 1. Selected Economic Indicators

	2014	2015	2016	2017 f	2018 f	2019 f
National Accounts (change in constant prices)						
Real GDP	7.6	8.9	5.9	5.2	5.9	6.8
Agriculture	6.7	5.0	3.9	5.1	5.0	5.0
Industry	11.0	8.8	6.7	4.8	5.0	6.0
Services	6.9	10.5	7.1	5.1	6.4	8.0
Prices						
CPI inflation, percent (end of period)	2.1	4.5	7.3	4.5	5.0	5.0
Central Government (% in GDP)						
Revenue and grants	24.2	24.5	23.7	22.0	22.5	21.7
Expenditures and net lending	30.3	29.4	27.4	27.1	26.5	26.1
Fiscal Balance	-6.0	-4.9	-3.8	-5.1	-4.0	-4.4
Fiscal Balance excluding grants	-13.7	-11.2	-8.9	-9.6	-8.4	-8.2
Debt Stock						
PPG Debt (% of GDP)	38.7	36.4	44.5	45.7	47.1	48.7
External Public Debt (% in GDP)	23.6	27.9	35.8	38.1	40.2	42.1
External Sector						
Exports (USD)	723	684	745	907	973	1,096
Imports (USD)	1,995	1,919	2,045	1,983	2,184	2,280
Current Account Balance (% in GDP)	-12.0	-13.4	-14.4	-11.7	-12.4	-11.7
Foreign Exchange Reserves USD)	1,022	922	1,001	1,037	1,048	1,157
Money and Credit						
Broad Money (% change)	19.0	21.1	7.6	13.0	13.2	-
M3 (% in GDP)	22.7	24.9	24.1	23.9	24.0	-
Credit to non-governmental sector (% change)	19.6	30.1	7.8	17.9	14.2	-

Source: World Bank staff calculations and estimates

Notes: f = forecast.

20. **Fiscal transfers to the energy sector have declined as a percentage of GDP.** In recent years, the authorities were able to strike a balance between their agenda of electricity sector expansion and fiscal sustainability. Overall fiscal transfers declined from an estimated 2.5 percent of GDP in FY2014/15 to an estimated 1.4 percent in FY2016/17, which helped maintain the fiscal space for other priority spending programs amid the declining fiscal envelope. Maintaining the current relatively low level of fiscal transfers to the electricity sector requires some important measures by the Government to mitigate the energy sector risks to fiscal sustainability stemming from possible excess capacity in the medium term.

21. **Public and publicly guaranteed debt has increased substantially since 2013 due to an investment push.** At end-2016, the public and publicly guaranteed debt stood at 44.5 percent of GDP, reflecting a sustained public investment expansion in RwandaAir and the Kigali Convention Center (KCC). Rwanda's debt portfolio has been further affected by a shift in the composition of official development assistance away from grants toward concessional borrowing.

Table 2. Fiscal Accounts (percentage of GDP)

	2013	2014	2015	2016	2017	2018	2019
				Prel	Proj.	Proj.	Proj.
Revenue and grants	25.5	24.2	24.5	23.7	22.0	22.5	21.7
Total revenue	16.2	16.5	18.2	18.5	17.5	18.1	17.9
Tax revenue	14.3	14.8	15.6	15.8	15.6	15.6	15.7
Direct taxes	6.3	6.0	6.5	6.6	6.3	6.7	6.9
Taxes on goods and services	7.0	7.7	7.8	7.9	7.9	7.7	8.0
Taxes on international trade	1.0	1.1	1.3	1.3	1.4	1.2	1.1
Non-tax revenue	1.9	1.7	2.6	2.7	1.9	2.5	2.2
Total Grants	9.3	7.7	6.3	5.1	4.5	4.4	3.8
Budgetary grants	4.7	2.8	2.7	2.9	2.3	2.2	1.9
Capital grants	4.7	5.0	3.6	2.2	2.2	2.2	1.9
Total expenditure and net lending	29.5	30.3	29.4	27.4	27.1	26.5	26.1
Current expenditure	13.7	15.4	14.5	15.4	14.5	14.5	14.4
Wages and salaries	3.6	3.6	3.6	4.2	3.5	3.9	3.9
Purchases of goods and services	2.5	3.3	2.6	2.7	2.9	2.8	2.7
Interest payments	0.9	0.8	0.9	1.0	1.2	1.2	1.3
Domestic Int (paid)	0.4	0.3	0.4	0.5	0.6	0.6	0.6
External Int (paid)	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Transfers	5.1	5.1	5.1	4.7	5.4	4.9	4.8
Exceptional social expenditure	1.6	2.7	2.3	2.5	1.5	1.7	1.7
Capital expenditure	13.2	13.1	13.0	10.6	10.4	10.2	9.9
Domestic	5.2	6.1	7.4	6.6	5.6	5.9	5.5
Foreign	7.9	7.0	5.7	4.0	4.8	4.2	4.3
Net lending	2.7	1.7	1.8	1.4	2.2	1.9	1.8
Primary deficit	(3.1)	(5.2)	(4.0)	(2.8)	(3.9)	(2.8)	(3.1)
Overall deficit (cash)	(4.0)	(6.0)	(4.9)	(3.8)	(5.1)	(4.0)	(4.4)
Excluding grants	(13.3)	(13.7)	(11.2)	(8.9)	(9.6)	(8.4)	(8.2)
Financing	4.0	6.0	4.9	3.8	5.1	4.0	4.4
Foreign financing (net)	6.7	3.3	4.3	4.2	5.3	4.2	3.9
Domestic financing	(2.7)	2.7	0.6	(0.4)	(0.2)	(0.2)	0.5

Source: MINECOFIN, World Bank staff calculations and estimates

22. **With an elevated public debt, the medium-term fiscal policy framework prioritizes revenue mobilization.** The Government initiated several revenue policy and administration measures to strengthen revenue mobilization. The main reform areas include property tax, a new risk management plan to improve tax compliance, and the expansion of the use of electronic billing machines. Notwithstanding the improvements in those reforms areas, tax revenues remain below 16 percent of GDP due to the tax expenditures arising from generous tax incentives that the authorities continue to extend to the private sector for attracting investments to Rwanda.

23. **The current account deficit has widened in recent years, leading to an adjustment program.** The current account deficit increased from 12 percent of GDP in 2014 to 14.4 percent in 2016. The key factors behind the growing external imbalance included the decline in the exports of minerals and large public investments with high import content initiated and implemented by the Government in 2014–2016. In response to the evolving macroeconomic developments and the widening external imbalances, the Government initiated the Standby Credit Facility (SCF) with the International Monetary Fund (IMF) to support its policy adjustment program through greater exchange flexibility and fiscal consolidation and

address growing external imbalances. Because of successful implementation of the program and more favorable external environment, Rwanda’s external imbalances have substantially narrowed during the first half of 2017 as export performance was strong on the back of a recovery in export prices for tea, coffee, and minerals. Growth in reexports and tourism sectors remained strong. Formal exports grew by 13 percent in U.S. dollar terms, while imports contracted by around 10 percent. It is projected that the current account deficit will be reduced by 2.7 percentage points in GDP in 2017.

24. **With the decline in the current account deficit (CAD), external financial requirements are expected to stabilize over the medium term.** The CAD is projected to decline to 11.2 percent of GDP by 2020 compared to the peak of 14.4 percent in 2016 (Table 3). Notwithstanding the projected increase in external debt amortization, the overall external financing requirements will stabilize at 12 percent of GDP because of projected improvement in CAD. With the decline in external grants, the role of private financing in meeting external financing requirements is expected to increase.

Table 3. External Financing Requirements and Sources (% of GDP)

	2015	2016 estimate	2017 projections	2018 projections	2019 projections	2020 projections
Financing Requirements (US dollars)	-13.3	-15.7	-12.7	-12.9	-12.1	-12.1
Current Account Deficit	-13.4	-14.4	-11.7	-12.4	-11.7	-11.2
Debt Amortization	-0.2	-0.3	-0.3	-0.3	-0.3	-0.6
Reserve accumulation	0.3	-0.9	-0.7	-0.2	-0.1	-0.3
Financing Sources (US dollars)	-13.3	-15.5	-12.8	-12.9	-12.1	-12.1
Grants	-6.5	-6.3	-4.8	-4.2	-4.4	-4.3
Debt Disbursements	-3.7	-4.7	-4.7	-4.7	-2.6	-2.3
Private	-3.1	-3.2	-2.7	-4.0	-5.1	-5.5
IMF	0.0	-1.2	-0.6	0.0	0.0	0.0

Source: World Bank staff calculations and estimates

2.2 MACROECONOMIC OUTLOOK AND DEBT SUSTAINABILITY

25. **Growth in 2017, at around 5 percent, will remain well below the historical average for Rwanda but is expected to accelerate in 2018 and onward on the back of improved investment activities, both public and private, and stronger performance in agriculture.** Economic activity will also benefit from the recovery of prices of traditional exports, including minerals, tea, and coffee. A more competitive exchange rate has been already supportive of nontraditional exports, potentially an important source of growth going forward. Agriculture outlook is positive for the medium term as the region recovers from a drought. The Government’s renewed commitments to scale up investments in agriculture, especially irrigation, will further strengthen the sectors’ medium-term outlook. Construction of the new airport will boost construction sector activities in 2018–2019.

26. **Key risks to the growth outlook are associated with weak external environment, persisting external imbalances, and weak private sector.** If the global prices of minerals, coffee, and tea continue to be weak, they will subdue production and exports, while the delayed exchange rate adjustment may affect incentives to investment in the nascent nontraditional export sector. The pace of structural transformation will largely depend on the extent of materialization of the 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.

27. **The fiscal deficit will remain below 4.5 percent of GDP in 2018 and 2019 as part of Rwanda’s prudent approach to the debt sustainability.** The fiscal policy stance, in the second half of 2017, will be more expansionary, but adherence to debt sustainability principles will constrain the use of fiscal policy in the medium term. The overall fiscal expenditure will be reduced as a percentage of GDP as tax-to-GDP ratio is projected to remain unchanged, while the decline in external grants will continue. In this context, continued focus on safeguarding the priority spending program is an important policy priority for Rwanda.

28. **A fiscally unaffordable expansion of the electricity sector is a major risk to fiscal sustainability.** Against the background of continued decline in grant financing and a low tax-to-GDP ratio, mitigating the fiscal risks emanating from possible excess generation capacity in the electricity sector is a critical policy priority. These risks will, in part, be mitigated through the Government’s actions supported by this operation.

29. **The 2017 Debt Sustainability Analysis (DSA) maintained Rwanda’s status of low risk of debt distress.** Under the baseline scenario, all debt burden indicators are projected to remain below the policy-dependent thresholds except for a small and temporary breach in the baseline of the debt service-to-revenue ratio and the stress test for debt service-to-exports in 2023, when the Eurobond issued in 2013 matures. Rwanda’s overall external vulnerability, however, remains high. Recognizing Rwanda’s investment needs on the one hand and its narrow export base and import-dependent growth on the other, the authorities are closely focused on carefully choosing the highest return projects, financed under the most favorable terms. In the context of the Compact with Africa, the authorities hope to encourage more private investment, leveraging guarantee schemes from multilateral and bilateral development partners and minimizing the Government’s exposure to additional liabilities.

30. **Overall, while risks remain, 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.

2.3 IMF RELATIONS

31. **In July 2017, the IMF successfully completed its seventh review of Rwanda’s economic performance under the program supported by the Policy Support Instrument (PSI) and the second review under the SCF, amounting to US\$204 million.** This financing will backstop international reserves in supporting the authorities’ adjustment efforts to address external imbalances, which are expected to modestly reduce growth in 2016 and 2017, as discussed earlier. After successful adjustment, policy relaxation can enable a growth rebound in 2018. This support was developed to address issues of foreign currency liquidity, as a response to a request from the authorities and to recommendations from the fifth review under the PSI conducted in April 2016. The Government has committed to implementing the

following policy measures: (a) exchange rate flexibility (that is, allow more depreciation of the Rwanda franc); (b) cut/delay in non-priority expenditures, especially ones with high import content; and (c) shift from accommodative to neutral monetary policy.

32. **The World Bank and the IMF have been closely collaborating in Rwanda.** The World Bank team participates in the IMF missions (the latest one in May 2017) and the IMF's internal meetings, as needed, and vice versa. The Joint Staff Advisory Note for EDPRS-II was completed in December 2013, and the DSA is jointly conducted on an annual basis (the latest completed in July 2017). In formulating the Program for Results on Public Sector Governance, the World Bank and the IMF collaborated on public financial management (PFM) reforms.

3. THE GOVERNMENT'S PROGRAM

33. **Rwanda's Vision 2020 aims to lift the country to middle-income status and to be a knowledge-based economy by 2020.** The vision is being implemented through a series of five-year medium-term strategic plans. The current five-year plan is EDPRS-II, whose implementation covers FY2013/14 to FY2017/18. EDPRS-II aims to accelerate the country's progress to lower-middle-income status and better quality of life for all Rwandese through sustained average GDP growth of 11.5 percent and accelerated reduction of poverty to less than 30 percent of the population.

34. **EDPRS-II puts the expansion of its electricity sector on top of the Government's development and poverty reduction program for 2014–2018 and sets ambitious targets for electricity generation capacity and access.** Electricity features in two of the four thematic areas of EDPRS-II: Economic Transformation for Rapid Growth and Rural Development. For the former, the objective was to ensure sufficient generation to meet all of Rwanda's energy demands by increasing the generation capacity to 563 MW (the generation target for 2018, currently being reviewed as a part of the National Strategy for Transformation for the period 2017–2024, including by attracting private sector interest in generation projects). For the latter, the objective was to increase access to electricity to 70 percent by 2018 through both grid and off-grid means. In May 2016, the Government approved a Rural Electrification Strategy (RES) that reframed the 2018 access target with regard to the tier level of access as defined by the SE4All MTF.⁸ The 70 percent target was defined to include 31–35 percent on-grid access, 13–17 percent off-grid access through systems providing at least Tier 2 access level, and the remaining 22 percent off-grid access through systems providing Tier 1 and above access level.

35. **Rwanda's NDC under the Paris Agreement lays out a vision of greening the power sector through mitigation actions on renewable energy and energy efficiency.** Specifically, the NDC defines Rwanda's contribution as emission reductions compared to a counterfactual, business-as-usual scenario, based on policies and actions conditional on availability of international support for finance, technology

⁸ The SE4All MTF initiative was developed to monitor and evaluate energy access under SE4All by following a multidimensional approach (see <https://www.esmap.org/node/55526>). The MTF approach goes beyond binary measurement of energy access as 'having or not having an electricity connection' or 'relying or not relying on solid fuels for cooking'. It takes into account a multidimensional view of the energy sector by considering various service levels and attributes such as availability, quality, reliability, health/safety, convenience, and affordability, and it addresses multiple technology options (for example, grid and off-grid electricity). The MTF measures access in the tiered spectrum, from Tier 0 (no access) to Tier 5 (the highest level of access). Under the MTF, Tier 1 (minimum 12 Wh per day) and Tier 2 (minimum 200 Wh per day) are 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>). Tier 3 has a minimum of 1 kWh per day and up to eight hours per day and at least three hours at night. Tier 4 has a minimum of 3.4 kWh per day and up to 16 hours per day and at least 4 hours at night. Tier 5 consists of safe, reliable, and unlimited 24-hour service from a grid system.

and capacity building. In the power sector, the NDC prioritizes (a) increasing in the share of new grid-connected renewable capacity compared to fossil fuels; (b) installing solar PV in rural communities; and (c) increasing energy efficiency through demand-side measures and grid-loss reduction.

36. Rwanda implemented a suite of restructuring measures to improve governance of the electric utility the sector and make it 'fit for purpose'. Structural sector reforms accompanying EDPRS-II strengthened sector institutions and clarified roles and responsibilities of different public entities in implementing the Government program. Most importantly, the separation of the electric utility from the water utility and the formation of two separate entities for utility operations, Energy Utility Corporation Limited (EUCL) and Energy Development Corporation Limited (EDCL) under the company law, allows for better governance and clear financial accountability between revenue-generation service functions and nonrevenue-generating infrastructure development. Tailoring business procedures, operational policies, and information technology (IT) solutions to the new functions and entities is still work-in-progress, however, and important steps still need to be taken to create fully functional, state-of-the-art electricity companies (see Section 4.2 for details).⁹

37. Rwanda's power sector has outpaced many of its peers in Sub-Saharan Africa. Generation capacity tripled from 76 MW in 2010 to 213 MW in 2017, and household grid access increased from 6 percent in 2009 to 29.7 percent in June 2017. However, both the generation and access targets under EDPRS-II (563 MW and 70 percent access by 2018) proved overambitious and are out of reach.

38. Rwanda's success in grid electrification has been based on sound geospatial targeting. In 2009, the Government, with support from the World Bank, prepared an EARP Investment Prospectus to address challenges related to the lack of credible electricity access plans. A geographic information system (GIS)-based spatial network plan was developed to optimize grid expansion in Rwanda through 2020. The prospectus integrated technical, financing, and implementation planning components. In an effort to build on the successful prospectus from a decade ago, the Government is now preparing a new National Electrification Plan (NEP) identifying least-cost technical electrification options for Rwanda, including off-grid and mini-grids, to provide a basis for the prospectus's regular updates.

39. The Government's program to improve sector outcomes was heavily subsidized by the budget. This is reflective of ambitious expansion targets and insufficient institutional capacity for least-cost investment planning and implementation to meet these targets. Due to a lack of significant domestic energy resources and because ambitious sector growth did not follow least-cost principles, rapid system expansion ended up costing more than it would have if the sector had followed a more considered approach (as discussed in Paragraph 7). The high cost made electricity unaffordable for many consumers. In fact, Rwanda's average consumption at about 35 kWh per month is quite low compared to its peers in Sub-Saharan Africa. The slow growth in demand, in turn, lowered system asset utilization and further

⁹ In 2013, the Government restructured the key energy sector institutions, aiming at achieving regulatory independence, financial sustainability, and increased private sector engagement. The policy-setting mandate lies with MININFRA. The Rwanda Utilities Regulatory Authority (RURA) regulates the sector, approves electricity tariffs, and so on. The former Electricity, Water, and Sanitation Authority (EWSA) was split, with REG taking over the electricity utility functions. Two subsidiaries were formed under the holding company REG: (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. While the Government retains ownership of the corporatized entities, the Government's role is significantly reduced as the utilities are governed under company law as opposed to public service law. This split of utility operations (EUCL) from energy resource development (EDCL) allows for clear financial accountability between energy development (nonrevenue) and utility operations (revenue-generating electricity business).

increased the average unit cost of supply. Budget transfers from MINECOFIN covered the gap between sector revenues and costs.

40. **In preparation for the National Strategy for Transformation for the period 2017–2024, the Government is shifting its focus from investment to policy and institutional reforms aimed at fiscal sustainability of the electricity sector, embracing least-cost planning and competitive procurement, enhancing transparency and accountability, and improving utility operations.** Measures to contain the revenue shortfall aim to ensure the fiscal sustainability of the electricity sector in the medium term. Reforms to sector planning, including a new NEP, aim to improve expansion planning and target setting and institutionalize least-cost principles to electricity access. Enhanced transparency and financial management aim to allow the utility to maximize financing, including private finance, for sector expansion. Improved regulations and utility operational policies aim to ensure system efficiency and improved quality of service for consumers. Together, these complementary measures underpin the aim of having a sustainable sector operating on commercial principles and being able to deliver services in an affordable and reliable manner.

41. **The private sector is envisioned as a strategic partner for investment in new renewable energy generation capacity in the access agenda.** The Government’s RES incorporates both grid and off-grid solutions. The new legal framework for renewable energy will promote private-sector investments in on-grid generation. Similarly, off-grid solutions, envisioned in areas where extending the grid is not financially viable in the short term, are expected to be primarily driven by the private sector. To enable increased private sector participation to the extent necessary to meet the Government’s ambitious access targets, the Government is putting renewed efforts into enhancing a transparent and predictable regulatory framework.¹⁰

42. **In its attempts to reduce the cost of electricity generation for the country, the Government is also taking steps to tap into regional integration benefits.** The Government is committed to developing regional hydropower projects: an 80 MW regional Rusumo Falls hydropower plant, to be equally shared by Rwanda, Tanzania, and Burundi, is currently under construction (with the support of the World Bank financing) and is expected to be operational in 2020; and a 147 MW regional Ruzizi III hydropower plant project (P148226), to be equally shared by Rwanda, the Democratic Republic of Congo, and Burundi, is under preparation. The Government is also in discussions with Kenya, Uganda, and Ethiopia on power imports. A first transaction for electricity imports from Kenya, for 30 MW per year, has been in place since 2015; the Government has signed a Memorandum of Understanding with Ethiopia for additional power imports.

43. **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**

¹⁰ Over the last five years, the off-grid industry has grown substantially in Rwanda, though the market remains at early stages underlined by the limited market penetration of off-grid systems. Over 200,000 Rwandese households have access to solar products, mostly through small solar systems such as solar lanterns. Under its new Rural Electrification Strategy, the Government aims to promote the use of larger solar home systems (Tier 1 and above). The solar mini-grid space is made up of about 80 solar PV micro-grids, with each system of 1 kW solar PV with batteries providing basic lighting and other services to clusters of up to 50 households per micro-grid. Moreover, the Hydropower Atlas, completed in 2007, identified 333 sites with capacities between 50 kW and 5 MW and 192 sites with capacities below 50 kW. There are a variety of productive loads in Rwanda, many of which are more than 5–10 km from the grid, which could be the basis for an anchor load for a mini-grid scheme. Although there is a plan to eventually connect such mini-grids to the central grid, the rate of grid rollout is dependent on available financing, and the timing of these connections is, therefore, uncertain.

the formulation and in 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 access¹¹ and generation capacity,¹² restructuring Rwanda's electric utility and improving its efficiency,¹³ asset and liability evaluation, sector capacity needs assessments, energy sector agencies' capacity strengthening, and comprehensive assessment of financial viability of the energy sector. The proposed programmatic operation supports the Government in taking many of these reform measures, initiated in previous World Bank operations, forward in a structured, pragmatic, yet transformative manner.

4. THE PROPOSED OPERATION

4.1 LINK TO GOVERNMENT PROGRAM AND OPERATION DESCRIPTION

44. **The proposed Energy Sector DPO in the amount of SDR 88.5 million (equivalent to US\$125 million) is the first in a programmatic series of three DPOs.** The 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.

45. **Actions in the proposed series aim to define and put in place a consistent and incremental road map toward 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 and ensuring transition to a low-carbon energy mix.** At the end of the DPO series, the country will have in place arrangements for regular updating and implementation of the LCPDP, whose initial preparation is a prior action of DPO 1. Rigorous implementation of the LCPDP will ensure that least-cost energy resources are prioritized, in particular hydropower and solar power, and developed in line with demand growth. At least one competitive process for least-cost implementation of projects identified in the LCPDP will be carried out. In addition, an investment plan for least-cost electrification will be adopted, in full consistency with the NEP approved by the Government.
- **Boosting revenues from electricity service delivery.** At the end of the series, EUCL will have fully incorporated the set of information systems to enable the efficient, transparent, and accountable execution of operations in key business areas (electricity supply, commercial functions, corporate planning, and corporate resources) and enhance both internal and external governance. The Revenue Protection Program (RPP) for sustainable reduction of nontechnical losses, based on the use of advanced metering technologies to permanently record and monitor consumption of the company's largest customers (currently around 2,000), representing around 50 percent of current sales and revenues, will be fully implemented, and overall losses in electricity supply will be at levels reflecting efficiency in operations. Finally, an updated pricing system will be in place, allowing medium-term

¹¹ Rwanda Electricity Access Scale-up and Sector Wide Approach Development Project (P111567, 2009, and 2013; US\$130 million); Rwanda Electricity Sector Strengthening Project (P150634, 2015; US\$45 million for access); and Scaling-up Renewable Energy Program-financed Rwanda Renewable Energy Fund (P160691, 2017; US\$50 million for off-grid access).

¹² Regional Rusumo Falls Hydroelectric Project (P075941, 2013; US\$340 million).

¹³ Rwanda Electricity Sector Strengthening Project (P150634, 2015; US\$50 million for utility reforms).

recovery of operating costs incurred for efficient service provision through tariffs charged to all consumers who are able to pay them.

- **Enhancing affordability of low-income consumers.** At the end of the series, conditions to boost demand will be put in place. Optimized cost of service delivery, together with a viable strategy to expand access and improve availability of connections to the most vulnerable, as well as an efficient safety net protection to grid-connected low-income consumers, will incentivize electricity consumption in all segments. Further, adopting international quality standards for solar products creates a conducive environment for credible private sector players to enter the Rwandan off-grid market and provide energy services to bottom-of-the-pyramid consumers.

46. **The choice of a programmatic DPO as a lending instrument is in line with the nature of the proposed reforms and the experience from previous SP DPO series.** The programmatic nature of the DPO matches the multiyear time horizon of the reforms supported, many of which require sustained government attention and follow-up to achieve the desired objectives. The proposed plan is based on a clear set of reforms for a three-year program that will help Rwanda lay the groundwork for successful sector development during the implementation of the third Economic Development and Poverty Reduction Strategy (EDPRS-III) (FY2018/19–FY2023/24) and the National Strategy for Transformation for the period 2017–2024. It builds on past achievements and lessons learned to support policy and administrative reforms, including under the World Bank’s three consecutive DPO series in the SP sector (FY2008/09–FY2016/17) through which Rwanda (a) established a good practice SP program (the VUP); (b) institutionalized efficiency, accountability, and transparency in the SP system; and (c) extended VUP coverage from 30 to about 360 out of 416 geographical sectors and from 25 to about 300,000 households. Finally, this instrument responds to client preference and is consistent with Rwanda’s adequate macro-fiscal framework.

47. **The DPO incorporates lessons learned from the World Bank’s past and current engagement in the energy sector in Rwanda.** Most notably, the DPO draws on lessons from the Rwanda Electricity Access Scale-up and Sector Wide Approach Development Project (EASSDP) and Rwanda Electricity Sector Strengthening Project (RESSP), which are under implementation. Specifically, the DPO

1. Strengthens planning capacity for least-cost access expansion;
2. Introduces improved accountability and transparency in implementing electrification programs;
3. Strengthens the systematic use of tools to improve the management and service delivery of electricity, especially the recently introduced management information system (MIS), to reduce losses in electricity supply, improve quality of service, and enhance financial performance; and
4. Contributes to the long-term financial sustainability of the sector.

48. DPO prior actions under Pillar B.2 are informed by and consistent with the Renewable Energy Fund, which provides finance for off-grid access.

49. **The Government’s reform program under this DPO series is underpinned by robust data analytics, global good practices of sustainable electrification, and a strong program of capacity building**

by the World Bank. Identification of options to improve financial sustainability of the sector will be conducted with the support of the Energy Sector Management Assistance Program (ESMAP). Lighting Africa and Lighting Global teams have been providing support to the Government with the implementation of the reforms targeting off-grid markets in Rwanda. The World Bank Public-Private Partnership (PPP) Cross-Cutting Solution Area will support Rwanda with building capacity to manage PPP arrangements. The technical assistance (TA) and capacity-building components of the EASSDP and RESSP have supported and will continue to support the Government to implement the reforms that are aimed at ring-fencing least-cost planning and improving operational efficiency of the utility.

4.2 PRIOR ACTIONS, RESULTS, AND ANALYTICAL UNDERPINNINGS

Pillar A: Contain fiscal impact of the electricity sector

DPO 1

Prior Action 1.1: The REG Board of Directors approved the assessment of 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.

DPO 2

Trigger 2.1: The REG Board approves the results of an efficient revenue requirement study, piloting the use of efficiency benchmarks in the calculation of the revenue requirement trajectory, and submits the results to MININFRA for presentation to the Economic Cluster.

Trigger 2.2: MININFRA adopts options to achieve energy sector fiscal sustainability and reduce explicit and implicit Government subsidies in the medium term and submits the results to the Economic Cluster.

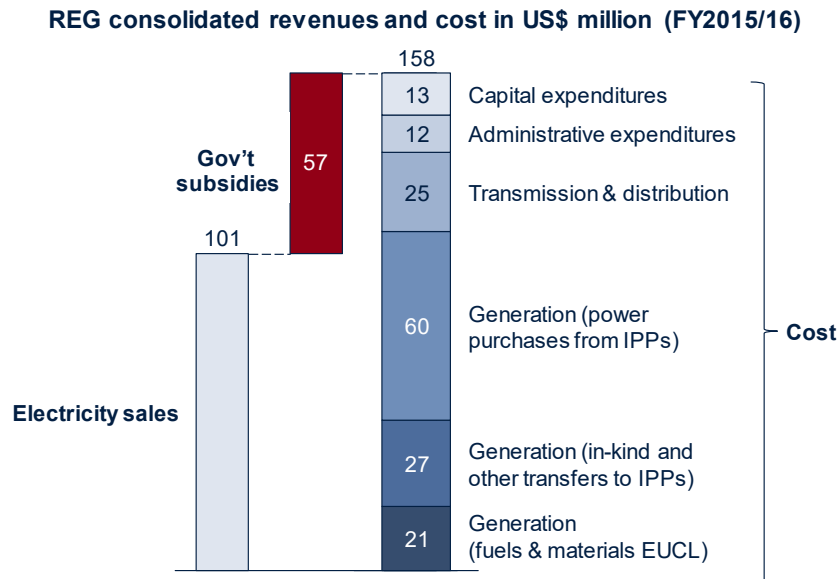
DPO 3

Trigger 3.1: The Economic Cluster approves a medium-term trajectory for fiscal transfers to REG, with the aim to gradually reduce Government subsidies to the sector.

50. **At present, tariff revenues collected by REG are insufficient to recover the operating costs of service provision to its customers.** Rwanda's electricity supply is expensive due to limited domestic energy resources and noncompetitively procured generation capacity. 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 region¹⁴—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\$57 million in total in FY2015/16, net of taxes).

¹⁴ The median tariff among the 39 countries in Sub-Saharan Africa surveyed by the World Bank in 2016 was US\$0.15 per kWh. Rwanda's tariff was the highest in East Africa and the 12th highest overall.

Figure 4. Cost of Electricity Service and Sales Revenues according to REG’s Consolidated Financial Results FY2015/16



Source: REG.

Note: Government subsidies are net of taxes. IPP = Independent Power Producer.

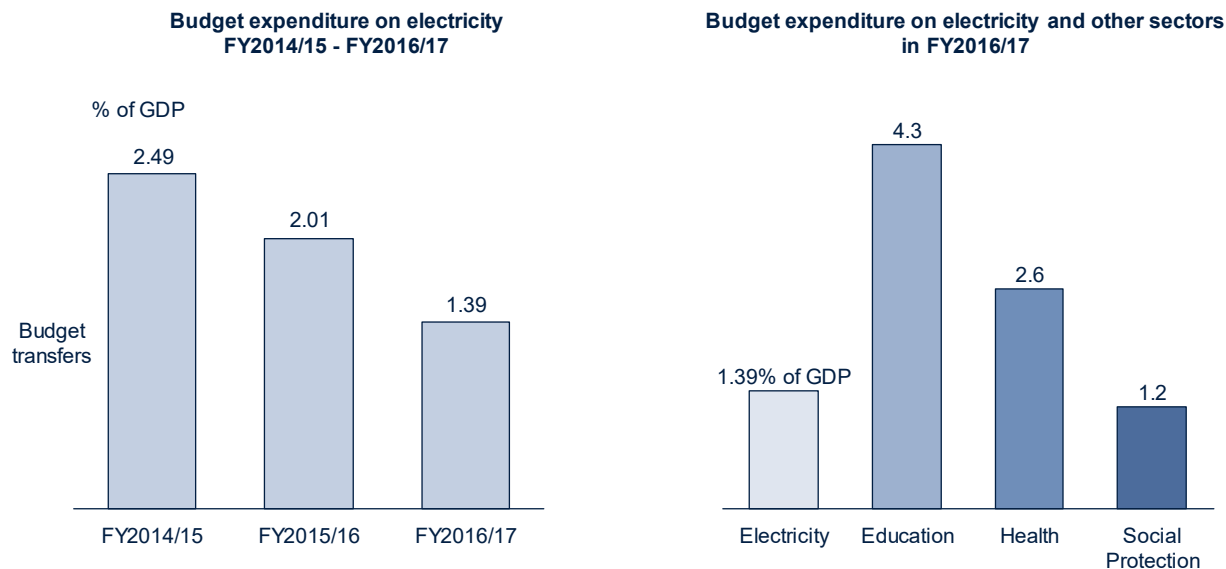
51. **Under business-as-usual circumstances, the envisioned sector expansion implies significant fiscal risks for the Government.** If the Government implements its plans to expand electricity supply and access under business-as-usual circumstances, the fiscal transfers needed to sustain operations in the sector, which are already at 1.4 percent of GDP, could increase significantly to over 4 percent by FY2020/21. Most of the potential increase in subsidies comes from a series of fossil fuel power plants under development (totaling 205 MW, about the same as the total current installed capacity) that are scheduled to come online in 2019–2020. A recent assessment commissioned by the Government¹⁵ concludes that, if implemented under the current schedule, these projects add a total of over US\$500 million in additional system cost (discounted to 2020), or about five times the current annual revenues, compared to a scenario of system expansion based on diesel and run-of-river hydro units only. These additional costs will mainly take the form of capacity payments to unused capacity, because demand is not keeping up with the new supply coming online.

52. **To contain the fiscal impact of sector expansion, the Government is implementing a program of subsidy rationalization (Pillar A of this series), accompanied by a sector reform program to ensure a multipronged approach to reducing cost and boosting revenues (Pillar B of this series).** Achieving financial sustainability of the power sector will require that REG’s revenues allow it to recover the full cost of service. To ensure that consumers do not pay for wasteful spending or overinvestment by the utility, the cost of service needs to be based on an estimate of the cost of efficient service provision. The Government has committed to approve and put in place a trajectory of budget transfers for the electricity sector to ensure that sector expansion remains fiscally affordable (that is, in line with projections in the Medium-Term Fiscal Framework), including a fiscally, politically, and socially acceptable ‘glide path’ toward cost-reflective tariffs. The trajectory will be approved at the level of the Economic Cluster, a subgroup of the Cabinet formed for effective implementation and monitoring of EDPRS priorities, the

¹⁵ IHS Energy. 2017. *Powering Development: Strategic Audit of Rwanda’s Electricity Sector*. Kigali, Rwanda.

highest level of approval for sectoral policies that will trigger action and install monitoring and accountability for the trajectory implementation.

Figure 5. Budget Transfers to Electricity Averaged 1.96 percent of GDP over FY2015–2017, Crowding out Spending on Human Development



Source: MINECOFIN

53. **Prior Action 1.1 and Trigger 2.1 establish the efficient revenue requirement (ERR)¹⁶ of REG, thereby providing the basis for a policy framework to ensure fiscal sustainability of the electricity sector in Rwanda.** REG’s assessment of its RR provides the basis for the Government’s strategy to restore REG’s financial independence from government support in the medium term. To establish the ERR, REG first conducted an assessment of the current RR (Prior Action 1.1), which will be independently reviewed and extended to an ERR study under DPO 2 (Trigger 2.1). The required analytical work is being carried out under the World Bank-funded EASSDP and RESSP, as well as through TA to REG funded by the Belgian Technical Cooperation (BTC).

54. **Triggers 2.1 and 3.1 capture the Government’s actions to develop a road map toward meeting REG’s RR, containing budget transfers and, in the long term, eliminating fiscal support to the electricity sector.** So far, fiscal transfers to the sector have been ad hoc, without a clear vision of the ways the sector would reach fiscal sustainability in a medium term. Under DPO 2, MININFRA is expected to approve a selection of alternative trajectories for transitioning to fiscal sustainability (Trigger 2.2). Fiscal sustainability is understood here as containing subsidies to the sector in the short term, reducing subsidies

¹⁶ The RR is an estimate of the revenue a utility needs to sustain its operations. The RR can either be based on the utilities’ current cost and operational performance (current RR) or on optimized cost and performance, using benchmarks for different efficiency and performance metrics (ERR). The value of the ERR is the minimum amount the sector has to receive through a combination of tariff revenues and external funds (government subsidies, grants, etc.). ERR defines in quantitative terms the ‘steady state’ condition to be achieved for sustained efficient operations. The current situation and related RR differ from the ‘efficient’ one, due to several factors. On the one side, there are inefficiencies in EUCL’s operations (notably high losses in electricity supply, which have a big impact on RR as they are valued at the very high generation cost). Moreover, some generation projects under procurement/execution do not correspond to least-cost options and/or are not implemented at least cost (based on directly negotiated deals rather than through transparent competitive processes), exacerbating the negative impacts of high generation costs on RR.

in the medium term and eliminating subsidies in the medium to long term. Containment and eventual reduction of subsidies will be achieved through measures to lower the cost of electricity generation complemented by measures relating to least-cost access expansion, incentivizing demand response, system losses, and operational efficiency (see Pillar B). Under DPO 3, the Government is expected to adopt one of these alternative trajectories and the corresponding targets for cost recovery and fiscal transfers (Trigger 3.1). The required analytical work will be supported by the World Bank’s TA to the sector. Funding for this activity was approved by ESMAP in August 2017.

55. **Expected results.** In view of the risks that under a no-reform (counterfactual) scenario the fiscal burden could reach 4 percent of GDP in the medium term, the program aims at containing fiscal transfers, rather than reducing them significantly from the current level, which is still relatively low. As such, Government subsidies to REG as a percentage of GDP are expected to be contained at a level of 1.4 percent of GDP in FY2019/20 (the same value as in FY2016/17). This target indicator is aligned with the Government’s Medium-Term Fiscal Framework and the IMF program review from July 2017.

56. **While the trajectory would be determined under Pillar A, actual containment of electricity subsidies will be the result of actions under Pillar A and Pillar B.** Actions under Pillar A will allow the ERR to be determined and make it possible for the Government to define and put in place a plan to minimize its contributions to meet those minimum financial needs of the power sector. Actions under Pillar B will reduce the cost of electricity generation, access expansion, and utility operations.

57. **Climate change mitigation co-benefits.** Consistent with the World Bank’s 2016 Climate Change Action Plan and Rwanda’s contributions to the Paris Agreement, this prior action, which relates to efficiency pricing of electricity, is expected to contribute to the reduction of carbon emissions because cost-reflective pricing will provide electricity users effective signals to promote efficiency in their consumption (Priority Mitigation Action 3.1 in Rwanda’s NDC). See also Annex 6 for details.

Table 4. Results Indicator of Pillar A

Indicator	Baseline	Target	Outcome
Contain electricity subsidies as % of GDP	1.4% (FY2016/17)	Not more than 1.4% (FY2019/20)	Improved fiscal space compared to counterfactual of expansion of subsidies as % of GDP

Pillar B: Improve the operational efficiency, affordability, and accountability of electricity service

B.1 Transition to least-cost and low-carbon energy mix

<p>DPO 1</p> <p>Prior Action 1.2: The REG Board of Directors approved the outline of the Sector Development Investment Plan, which is based on the Least-cost Power Development Plan (LCPDP).</p> <p>Prior Action 1.3: MININFRA adopted a resolution requiring the LCPDP to be updated on an annual basis by REG.</p> <p>Prior Action 1.4: 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 analyst; and (iii) the certification on PPP matters of at least two staff of the SID.</p>

DPO 2

Trigger 2.3: The Economic Cluster approves new generation capacity targets for the electricity sector in the National Strategy for Transformation for the period 2017–2024 that are consistent with the LCPDP.

Trigger 2.4: The RDB develops, approves, and publishes new procedures for competitive procurement of private sector-owned energy infrastructure, in pursuance of the PPP Law of 2016.

Trigger 2.5: MININFRA endorses new draft legislation for renewable energy and submits it to the Economic Cluster for approval.

DPO 3

Trigger 3.2: The REG Board approves an updated LCPDP.

Trigger 3.3: The Economic Cluster approves new draft legislation for renewable energy.

Trigger 3.4: MININFRA approves additional policy or institutional measures to implement the LCPDP (to be identified during preparation of DPO 3).

Trigger 3.5: RURA approves the regulatory framework for cross-border electricity trade.

58. **Optimizing the development of Rwanda’s electricity supply options—which include hydropower, solar, geothermal, methane dissolved in water (Lake Kivu) peat and imports, could significantly reduce costs and emissions compared to the counterfactual, business-as-usual scenario.** Least-cost planning will optimize supply costs from a country perspective, from power generation (including assessment and development of energy resources) to the effective connection of end users. At present, due to the lack of systematic planning of the investments needed to develop the sector, the mix of primary resources used for electricity generation shows a dependence on imported oil products, which are expensive and polluting. As Rwanda is a landlocked country located far from the main ports in the East Africa region, the impact of international prices of oil products on electricity generation costs is exacerbated by expensive freights, because fuels are transported over long distances by truck. This situation jeopardizes the sustainable development of the power sector and needs to be drastically changed. In addition, new investments in electricity generation made by private developers (independent power producers) are, in general, implemented through directly negotiated deals, preventing the country from getting the benefits of transparent, competitive processes. Moving ahead from the current, challenging conditions requires the Government to prepare and keep updated an LCPDP and implement all investments in the plan (public and private) in all segments of the electricity supply chain (generation, transmission, and distribution) according to the respective timelines through competitive processes, to ensure transition to least cost, low carbon energy mix for the country.

59. **The Government aims to move from bilaterally negotiated agreements based on unsolicited proposals to competitive procurement, informed by an LCPDP.** To meet its ambitious target of 563 MW of capacity by 2018 under EDPRS-II, the Government has entered commitments for the installation of large amounts of new generation capacity. However, these decisions were not guided by least-cost principles.¹⁷ In fact, most of the added installed capacity was procured based on unsolicited proposals, without adequate consideration of the relative costs and benefits of different options derived from properly conducted least-cost planning. Carrying on with this approach will inevitably impose significant, undue financial burden on the sector. The negative impact could be exacerbated if demand falls short of expectations. Especially after 2018, new capacity additions may outpace demand. The power plants in the pipeline, if completed according to the Government’s target years, far exceed the expected peak demand by 2025. In view of these challenges, the Government will work to improve sector planning and make

¹⁷ A draft LCPDP was prepared in FY2014/15 with donor funds and presented to the Energy Sector Working Group on February 9, 2015. However, the plan was never adopted by the Government.

procurement of installed generation capacity more competitive. Prior actions and triggers in Pillar B.1 are expected to fundamentally transform the electricity sector development in Rwanda by introducing and ring-fencing proper sector planning, especially in developing generation capacity.

60. **Prior Actions 1.2 and 1.3 and associated triggers capture the Government's efforts to adopt least-cost expansion planning and competitive procurement.** Under DPO 1, the REG Board is expected to adopt a Sector Development Investment Plan, based on the LCPDP prepared by REG's planning team and a team of consultants (Prior Actions 1.2). To ensure that the LCPDP remains up-to-date, MININFRA is expected to adopt a resolution for the LCPDP to be updated on an annual basis (Prior Actions 1.3). The results of the LCPDP are expected to feed into the targets of the National Strategy for Transformation for the period 2017–2024 (Trigger 2.3). Follow-up measures by MININFRA, to implement the LCPDP, are captured under Trigger 3.4. The Government-funded LCPDP is being prepared with advice from the World Bank.

61. **Further triggers under DPO 2 and DPO 3 will put in place legislative and regulatory building blocks for implementation of the LCPDP.** Two of these reforms are expected to be achieved by DPO 2. First, the RDB is expected to have developed, approved, and published procedures for competitive procurement of private energy investments according to the Medium-Term Investment Plan under the PPP Law approved in 2016 (Trigger 2.4). Second, MININFRA is expected to draft and approve a new draft renewable energy legislation, which will optimize the legal framework for small-scale renewable energy plants (Trigger 2.5). Under DPO 3, the renewable energy legislation is expected to pass Cabinet approval (Trigger 3.3). Further, RURA is expected to put in place the regulatory framework for cross-border electricity trade, enabling imports of lower-cost supply and export of excess capacity, thereby optimizing the cost of the power mix through enhanced regional trade and thus, stronger regional integration of Rwanda (Trigger 3.5).

62. **Expected results.** Two results are expected from the measures on least-cost planning. First, from 2019 onward, all generation and transmission projects accepted by the Government are expected to be procured according to the LCPDP and comply with the PPP Law and competitive procurement procedures (Results Indicator B1). Second, the Government aims to initiate at least one competitive procurement process to procure investments identified in the LCPDP (Results Indicator B2). The most important levers for cost improvement for the Government lie in the optimization of the pipeline of projects already under development and consideration. The LCPDP assesses different scenarios for optimized phasing and scheduling of the projects in the pipeline and demonstrates the cost implications of each scenario, indicating significant savings potentials. Decisions on which scenario to pursue are expected by DPO 2.

63. **Climate change mitigation and adaptation co-benefits.** The adoption and regular update of the LCPDP will improve generation investment planning in Rwanda's power sector (Prior Actions 1.2 and 1.3 as well as associated triggers) thus enabling Rwanda to transition to least cost, low carbon energy mix for the country. Capacity strengthening and adequate staffing of the PPP unit in the RDB will be critical for the effective implementation of the LCPDP, especially the implementation of large-scale PPP investments in solar power as envisioned under the LCPDP (see Annex 6) (Prior Actions 1.4 and associated triggers). Improved generation investment planning and effective implementation of the LCPDP are expected to yield significant climate mitigation and adaptation co-benefits. Hydropower, solar power, and lake methane represent Rwanda's lowest-cost and lowest-emission options for expanding electricity supply in the medium to long term. Therefore, Rwanda's NDC aims to increase the share of these three fuels in its electricity generation mix (Priority Mitigation Action 1.1 in Rwanda's NDC). However, the effective utilization of hydropower and solar power requires adequate planning of the supply-demand balance and

the grid. This is demonstrated by the LCPDP, which shows that higher hydro and solar utilization reduces system costs compared to the business-as-usual case (the current project pipeline). Adoption, regular update, and effective implementation of the LCPDP will, therefore, increase a share of renewables in Rwanda energy mix and reduce GHG emissions from the power sector compared to the business-as-usual scenario. As detailed in Annex 6, the lowest-cost LCPDP Scenario C increases the share of renewables in Rwanda energy mix to 59 percent by 2030, compared to 45 percent under business-as-usual scenario (an increase by a third) and reduces emissions by 560,000 tCO_{2eq} per year by 2030 compared to the business-as-usual scenario (a 44 percent reduction). Further, the LCPDP allows the Government to better plan for hydrology risks and mitigate their impact on the security of supply, thus strengthening the adaptation framework for the sector. See also Annex 6 for details.

Table 5. Results Indicators of Pillar B.1

Indicator	Baseline	Target	Outcome
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.	No (September 2017)	Yes (December 2020)	Optimize cost of service and create a more competitive environment for the private sector.
Initiate competitive procurement processes initiated to implement investments identified in the LCPDP.	0 (September 2017)	At least 1 (December 2020)	

B.2 Increase access to affordable and reliable electricity services

DPO 1

Prior Action 1.5: 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.

Prior Action 1.6: 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.

Prior Action 1.7: 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.

Prior Action 1.8: 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.

DPO 2

Trigger 2.6: The Economic Cluster approves separate, revised targets for on-grid and off-grid electrification under the National Strategy for Transformation for the period 2017–2024.

Trigger 2.7: The REG Board approves the National Electrification Plan (NEP), which identifies principles for investments to achieve the Government’s access targets in a more efficient manner, and submits it to MININFRA for approval.

Trigger 2.8: MININFRA adopts procedures for implementing investments in on-grid and off-grid electrification, as defined in the NEP, and approves a grid extension plan prepared in full accordance with the least-cost options, as defined in the NEP.

Trigger 2.9: The Government takes further policy and institutional actions to ensure electricity access remains affordable for poor households (to be identified during preparation of DPO 2).

Trigger 2.10: MININFRA approves the procedure for simplified procurement of mini-grids under 50 kW and 100 kW, consistent with the new PPP Law and the simplified licensing framework.

DPO 3

Trigger 3.6: The Government approves financing plan for the implementation of the NEP.

Trigger 3.7: MININFRA takes further policy and institutional actions to ensure timely implementation of the NEP (to be identified during preparation of DPO 2).

Trigger 3.8: The Government takes further policy and institutional actions to ensure electricity access remains affordable for poor households (to be identified during preparation of DPO 3).

64. **Drawing on lessons learned over the past five years, the Government is implementing policy and institutional reforms to achieve electricity access in a more cost-efficient manner during the National Strategy for Transformation for the period 2017–2024.** New connections to the grid are expensive and incomes in rural areas are low, limiting households’ ability to afford electricity, as it has been highlighted by the results of the recently completed MTF Survey. This is the case especially for new customers who faced high up-front payments.¹⁸ The affordability challenge and the steep cost reductions in off-grid solar solutions have triggered the Government to reconsider its strategy for access expansion

¹⁸ Even though the average cost of a connection to the main grid has been reduced to US\$490 per connection (from a design cost of over US\$1,000 per connection in 2010) and a significant connection subsidy is provided by the Government (customers pay approximately US\$67 per connection, with an up-front payment of about US\$18 and the rest over time together with the monthly electricity bill), not all consumers within grid coverage use utility supply, typically due to the inability to pay either the connection cost and/or monthly charges.

and put more emphasis on off-grid solar to provide access to households that have relatively basic electricity needs and would have difficulties affording even a subsidized connection fee for a grid connection.¹⁹ The EDPRS-II anticipated 48 percent of the 2018 target to be achieved through grid extension, and 22 percent through off-grid solutions (bringing the total to 70 percent). In May 2016, the Government approved a RES that puts a much stronger emphasis on off-grid solutions. Under the draft National Strategy for Transformation for the period 2017–2024, grid access is expected to reach 52 percent by 2024; 48 percent are expected to be connected through off-grid solutions. To implement the new targets, the Government is improving its electrification planning to put the new electrification policy into practice, reforming the pricing of electricity and new connections, and putting in place new procedures for simplified procurement of small mini-grids. These efforts are captured by the prior actions and triggers in Pillar B.2, which will introduce a more systematic approach to electrification that is expected to further streamline Rwanda’s ambitious access agenda.

65. Prior Action 1.5 and associated triggers capture reforms to electrification planning procedures.

To translate the Government’s targets for on-grid and off-grid access expansion into practice, REG is preparing the NEP and related investment plans, aimed to define and put in place institutional arrangements, least-cost technical options, and financing arrangements for investments needed to achieve the ambitious targets set on access to electricity services. Under DPO 1, REG is expected to complete an internal audit of the current electrification planning procedures (Prior Action 1.5). This audit will feed into the new electrification targets in EDPRS-III (Trigger 2.6) and the NEP. The NEP is expected to be adopted by MININFRA under DPO 2 (Trigger 2.7). To ensure timely implementation of the NEP, MININFRA is expected to adopt implementation procedures for on-grid and off-grid electrification under DPO 2 and approve a grid extension plan prepared in full accordance with the least-cost options, as defined in the NEP (Trigger 2.8). The NEP, to be approved by MININFRA, is expected to include specific actions on gender and citizen engagement. Under DPO 3, the Government is expected to approve a financing plan for the investments needed for the implementation of the NEP (Trigger 3.6). Possible further follow-up measures for the implementation of the NEP are captured by Trigger 3.7.

66. Prior Actions 1.6 and 1.7 capture reforms to the pricing of electricity and new connections that will significantly improve affordability for the poorest and most vulnerable households, without significantly reducing REG’s overall revenue base. In a recently completed MTF Survey conducted by the World Bank, the high up-front payment was cited by households as the primary reason for not seeking a connection (55 percent of respondents). Two measures are being taken by the Government under DPO 1 to reform the pricing structure in a way that makes electricity affordable while promoting demand that can be served cost-effectively. First, to ensure affordability for the poor, a lifeline tariff for all households consuming less than 15 kWh per month became effective with the new tariff structure starting January 1, 2017 (Prior Action 1.6). This measure cut tariffs for the poorest households by half, without significantly affecting REG’s revenue base (affected households are responsible for an estimated 3.5 percent of the total demand). Second, the Government developed and approved a new connection policy that allows low-income households to pay the connection fee in several installments, thereby making new connections more affordable for households without access to significant savings or financing (Prior Action 1.7). Because many such households previously chose not to activate their installed connections at all, this measure is expected to marginally increase revenues for EDCL. Depending on the outcomes of these prior actions, follow-up measures may be needed to further address affordability issues and optimize the pricing structure. These follow-up actions are captured by Triggers 2.9 and 3.6. Specific

¹⁹ The high cost of reaching rural households through the grid because of difficult terrain, together with low residential electricity demand and poor affordability, affects the financial sustainability of grid-extension investments in rural areas.

analysis and actions will be outlined to address gender and poverty dynamics linked to access, for example, by using women's groups as community mobilizers or tailored connection repayment schemes to target female- and male-headed households.

67. **Prior Action 1.8 captures the Government's efforts to ensure the sustainability of the off-grid solar market.** The Rwandese off-grid solar market has emerged as one of the most active in Sub-Saharan Africa in the last decade. Because customers need to be confident about the quality and reliability of stand-alone solar power systems using PV, the establishment and enforcement of minimum quality standards are essential to support the sustainable growth of the off-grid market. It is noted that the introduction of poor-quality systems can threaten customer trust of the technology and, hence, jeopardize the sustainability of the market. Under DPO 1, the Rwanda Standards Board (RSB) will issue an order adopting standards developed by the International Electrotechnical Commission, which should be consulted in the design and installation of stand-alone solar PV power systems. MININFRA will develop the Ministerial Guidelines on Minimum Standards Requirements for solar home systems to support standards enforcements. To improve its capacity to verify compliance with recently adopted off-grid standards, the RSB is exploring options to establish a testing lab in Rwanda. There is an ongoing discussion to restructure the RSB to move the standards enforcement mandate from the RSB to a separate agency in order to strengthen the enforcement of off-grid standards in Rwanda.

68. **Trigger 2.10 captures reforms to the procurement of mini-grids.** Although Rwanda introduced a simplified licensing framework for mini-grids below 50 kW and 100 kW, the new PPP Law, approved in 2016, does not provide a similarly simplified procurement procedure for such mini-grids. To eliminate this inconsistency, under DPO 2, MININFRA is expected to develop and approve the procedure for simplified procurement of mini-grids under 50 kW and 100 kW, consistent with the new PPP Law and simplified licensing framework.

69. **Expected results.** The reforms implemented under the DPO series are expected to make electricity more affordable for households, and thus help increase the overall electrification rate (as a percentage of households) from 40.7 percent to at least 55 percent by 2020/21 (38 percent on-grid and at least 17 percent off-grid) (Results Indicator B3). Rural households, due to their lower average income, have difficulties paying for connections at current prices and are set to benefit disproportionately from a shift in Government priority toward (much more affordable) off-grid solar solutions. The electrification rate among rural households is expected to increase as a result (Results Indicator B4); the exact increase will be determined during the preparation of DPO 2, after the NEP is completed. The expected outcomes in cost savings are captured by Results Indicator A1.

70. **Climate change mitigation co-benefits.** Prior Actions 1.5 and 1.8 and Trigger 2.10 are key steps toward implementation of the Government's new policy to put a stronger emphasis on off-grid solar and solar mini-grids for electricity access. By relying on solar rather than grid-based electricity (which had an average emission factor of 240 gCO_{2eq}/kWh in 2016), this policy will reduce emissions from access expansion significantly (also see Annex 6). Prior Action 1.6, which relates to the pricing of electricity, is expected to contribute to the reduction of carbon emissions. Time-of-use incentives and demand charges for large consumers provide industrial electricity users effective signals to promote efficiency in their consumption and shift consumption away from demand spikes. Because all peaking power plants in Rwanda are oil fired, this smoothening of the demand profile will have climate change mitigation co-benefits. Pillar B.2 is thus closely aligned with Rwanda's NDC, specifically NDC Priority Mitigation Action 2.1 (installing of solar PV mini-grids in rural communities) and NDC Priority Mitigation Action 3.1

(increasing energy efficiency through demand-side measures and grid-loss reduction). See also Annex 6 for details.

Table 6. Results Indicators of Pillar B.2

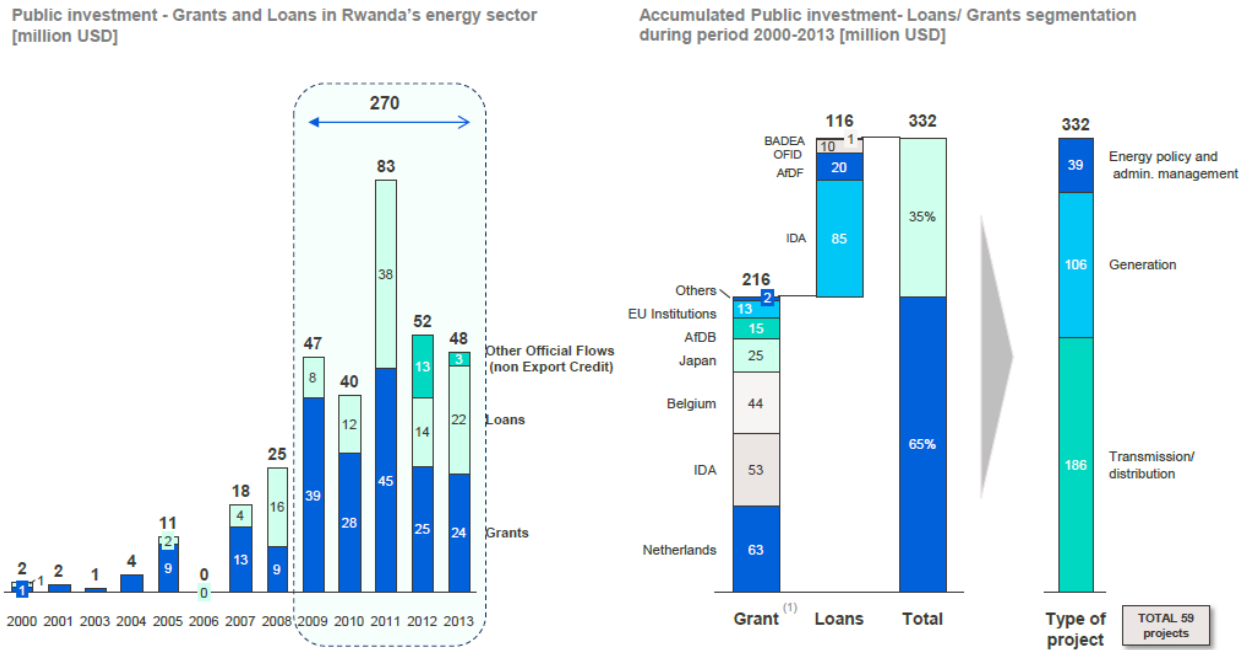
Indicator	Baseline (%)	Target (%)	Outcome
Expand electrification rate countrywide	40.7	55	Increased electricity access and stronger role for the private sector
Electricity access (on grid)	29.7	38	
Electricity access (off grid)	11	17	
Expand electrification rate among rural households	16.0	To be determined during preparation of DPO 2 based on the final NEP	Increased electricity access among the rural population

B.3 Improve accountability and transparency of REG

<p>DPO 1</p> <p>Prior Acton 1.9: The REG Board of Directors (i) endorsed the shift to consolidate 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.</p> <p>DPO 2</p> <p>Trigger 2.11: REG’s annual financial statements are prepared according to IFRS, audited by an independent auditor, and published.</p> <p>DPO 3</p> <p>Trigger 3.9: The REG management approves further revisions to its financial procedures to address any qualifications by the independent auditor to ensure that REG’s annual financial statements are prepared in full compliance with IFRS.</p> <p>Trigger 3.10: The REG Board institutionalizes the annual publication of REG’s financial statements within the first two quarters of the following year and distribution to key stakeholders.</p>
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71. **REG currently relies on Government support and donor financing to meet the Government’s electricity supply and access targets.** REG’s capital expenditures, most of which are implemented by EDCL, are mostly covered by budget support in the form of grants from the Government, sourced from multilateral and bilateral developing partners (see Figure 6). Access to commercial loans for REG’s own projects has been very limited. For generation, Rwanda has been able to attract private finance for generation with REG as offtaker but only with the backing of sovereign guarantees for REG’s payment to the private sector.

Figure 6. Financing Sources for Public Investment in Electricity in Rwanda (2000–2013)



Source: REG.

72. **REG does not produce IFRS-compliant financial statements and does not publish the statements of its subsidiaries.** REG’s two subsidiaries apply different accounting methods (EDCL’s financial reports are cash basis and modified cash basis based, while EUCL reports are accrual based), which creates difficulties when reporting on the holding level. The fact that the financial statements are not published creates incomplete transparency regarding the sector’s financial performance. This creates risks: international experience suggests that countries that reform electricity subsidies without having in place solid financial management and accounting systems often risk racking up off-balance-sheet losses and cross-debt between public sector entities. It also makes the sector less attractive for private finance and increases its dependence on government support.

73. **To increase financial transparency, REG is reforming its financial reporting procedures to adopt the internationally harmonized IFRS²⁰ (Prior Action 1.9 and related triggers).** Under DPO 1, REG is expected to approve (a) a road map for EUCL to adopt IFRS and (b) a revision to its internal financial procedures, including a revision to its chart of accounts to make them compatible with IFRS and revisions to its information gathering and disclosure procedures. These are important milestones in the transition toward IFRS compliance. Subsequent milestones are captured by the triggers for DPO 2 and DPO 3. From FY2017/18 onward, REG’s financial statements are expected to be prepared according to IFRS, audited, and published (trigger for DPO 2). From FY2018/19 onward, REG’s financial statements are expected to receive an audit without qualifications and published within the first two quarters of the subsequent fiscal year (trigger for DPO 3). The adoption of IFRS is being carried out with REG’s own resources, but the World Bank is providing guidance to REG’s financial management specialists in the process.

74. **Expected results.** Because of Prior Action 1.9 and related triggers, from FY2019/20 onward, REG’s financial statements will be in full compliance with IFRS. The independent audit is without qualifications

²⁰ IFRS are globally the most common set of accounting, information gathering, and disclosure standards. Adopting IFRS makes a company’s reporting more transparent and comparable and can help companies broaden their potential sources of financing.

and the audited financial statements will be published within the first two quarters of the following year and distributed to key stakeholders (Results Indicator B5). This output is expected to contribute to REG’s ability to attract private and commercial finance by improving financial transparency, both as an offtaker of privately financed independent power producers or as a borrower from commercial banks. This, in turn, is expected to reduce the sector’s reliance on public finance and sovereign guarantees.

Table 7. Results Indicator of Pillar B.3

Indicator	Baseline	Target	Outcome
Ensure REG’s financial statements are in full compliance with IFRS, their independent audit is without qualifications, and they are published within the first two quarters of the following year and distributed to key stakeholders.	No (September 2017)	Yes (December 2020)	Increased accountability and transparency of REG, enabling increased access to private finance in the medium term

B.4 Improve operational efficiency and quality of electricity services

<p>DPO 1</p> <p>Prior Action 1.10: 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.</p> <p>Prior Action 1.11: 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 a competitive hiring process for the appointment of a new REG CFO.</p> <p>DPO 2</p> <p>Trigger 2.12: The REG Board approves a strategy and the related operational procedures for improving commercial customers’ quality of service and the general quality of electricity supply.</p> <p>Trigger 2.13: (i) The REG Board approves a corporate budget that increases staffing and resources for the GIS unit. (ii) REG management revises the operational procedures for new connections to include GIS data collection for all new connections. (iii) REG management pilots the use of GIS data in the identification of grid failures and complaint resolution.</p> <p>Trigger 2.14: The REG Board adopts operational procedures for efficient corporate planning and HR.</p> <p>DPO 3</p> <p>Trigger 3.11: The REG Board approves and publishes the independent evaluation of EUCL’s performance.</p> <p>Trigger 3.12: The REG Board adopts operational procedures for efficient procurement and logistics.</p>

75. **The current operational performance of the national energy holding, REG, and its two fully owned affiliate entities, EUCL and EDCL, require significant improvements.** The quality of electricity services provided by EUCL to its customers is substandard and total electricity supply losses are high, which has significant negative consequences due to the expensive generation cost. Improving EUCL’s operational performance in a sustainable manner is crucial for the development of the power sector of Rwanda. Optimization of losses will result in a reduction of the cost of electricity supply (lower generation to serve the same demand). Good quality of electricity services is a necessary condition to apply cost recovery tariff rates to all users who are able to pay them. This will pave the way toward financial viability of the utility and the sector as a whole, which is key to enable investments needed to expand all segments,

to be implemented both by private agents (mainly generation plants and new transmission systems) and EUCL itself.

76. **A set of very concrete actions to transform EUCL into an operationally efficient utility has been identified in recent years, which are at different implementation stages.** With support from the World Bank and other development partners, the company has adopted a new organizational structure and appointed staff in all positions through transparent, competitive selection processes. Information systems are being incorporated to enable efficient, transparent, and accountable execution of operations in key business areas (electricity supply, commercial functions, corporate planning, and corporate resources) and enhance internal and external governance. An RPP for sustainable reduction of nontechnical losses, based on the use of advanced metering technologies to permanently record and monitor consumption of the company's largest customers (currently around 2,000), representing around 50 percent of current sales and revenues, is under implementation.

77. **Prior Action 1.11 captures the utility's efforts to improve its managerial capacity.** To ensure that its top management is drawn from a large talent pool, REG is institutionalizing the international competitive hiring processes for its senior management. Under the DPO, REG piloted the process by hiring its new Chief Executive Officer (CEO). After the successful selection, the same process is being applied to the Chief Financial Officer (CFO).

78. **Prior Action 1.10 and Triggers 2.12, 2.13, and 3.11 capture the utility's efforts to leverage IT to reduce system losses and improve the quality of service.** This includes improved data collection on losses (Prior Action 1.10 [i]), quality of service (Trigger 2.12), and the precise geospatial locations of its assets (Trigger 2.13), as well as devising strategies for data-driven performance improvements (Prior Action 1.10 [ii] and Trigger 2.12). Lastly, to make sure it addresses the right priorities, REG is further planning an independent evaluation of EUCL's performance (Trigger 3.11).

79. **Triggers 2.14 and 3.12 capture REG's efforts to overhaul its corporate resource management.** When it was founded after the split of the integrated water and electricity utility in 2013, REG took over a number of different IT solutions, based on varied technological platforms and often operating in isolation. To overcome this situation, REG is developing a comprehensive Integrated Business Management System (IBMS). The system was launched in June 2017, covering the Enterprise Resource Planning System: financial, human resources (HR), projects, and supply chain management; Phase II, planned for December 2017, will cover the Commercial Management System (CMS): connections, metering, billing, and complaints; and the Incident Recording and Management System (IRMS): service fault identification, field service delivery, resolution, and real-time reporting. The IBMS will be gradually extended to the larger scope of REG's operations. In that process, REG's operational procedures have to be modified to ensure that benefits from the new system are maximized. REG's financial procedures have already been reformed (Prior Action 1.9). Triggers 2.14 and 3.12 capture the overhaul of its operational procedures for corporate planning and HR and efficient procurement and logistics, respectively. HR actions are expected to include a focus on gender equality with regard to REG's recruitment mechanism under Trigger 2.14.

80. **REG has set strong targets to reduce commercial losses and improve the quality of service.** This includes improving the operational performance of EUCL, including the implementation of the RPP and full incorporation and systematic use of the CMS to support efficient execution of all commercial operations company-wide. It also includes the full incorporation and systematic use of the IRMS to

support processes and activities for effective and quick attention and resolution (service restoration) of customers' complaints related to outages and other incidents affecting the quality of electricity supply.

81. **Expected results.** REG's reforms are expected to result in more efficient utility operations and improved quality of service. Specifically, the measures under the DPO series are expected to result in (a) reduced total commercial losses as a percentage of electricity supply (Results Indicator B6), from 11.95²¹ percent in FY2012/13 to 8.95 percent in FY2019/20, (b) reduced average duration of interruptions (as measured by System Average Interruption Duration Index (SAIDI) [Results Indicator B7] and baseline and target values to be determined during the preparation of DPO 2), and (c) the successful completion and publication of the annual customer satisfaction survey by FY2019/20 (Results Indicator B8).

82. **Climate change mitigation co-benefits.** By promoting operational efficiency and system management, the prior actions and associated triggers under Pillar B.4 are expected to lower system losses, which would reduce the need for fossil-fueled generation to meet demand, thereby reducing carbon emissions. See also Annex 6 for details.

Table 8. Results Indicators of Pillar B.4

Indicator	Baseline	Target	Outcome
Reduce total commercial losses as a percentage of electricity supply	11.95% (2013)	8.95% (FY2019/20)	Improved energy efficiency and lower emissions
Reduce average duration of interruptions (SAIDI)	Baseline and target values to be determined during the preparation of DPO 2, based on new monitoring data on quality of service (result of actions taken under DPO 1)		Improved quality of service
Implement and publish annual customer satisfaction survey	No (FY2016/17)	Yes (FY2019/20)	Improved quality of service and accountability of the utility to consumer feedback

²¹ REG's Strategic Plan 2017–2026 and EDCL and EUCL Business Plans 2017–2019. Minsait by Indra

Table 9. DPO Prior Actions and Analytical Underpinnings

Prior Actions	Analytical Underpinnings
Pillar A: Contain fiscal impact of the electricity sector	
<p>Prior Action 1.1: 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.</p>	<ul style="list-style-type: none"> • The World Bank. 2016. <i>Making Power Affordable for Africa and Viable for Its Utilities</i>. Washington, DC. • IHS Energy. 2017. <i>Powering Development: Strategic Audit of Rwanda’s Electricity Sector</i>. Kigali, Rwanda. • Indra/Minsait. 2017. <i>REG’s Strategic Plan 2017–2026 and EDCL and EUCL Business Plans 2017–2019</i>. Minsait by Indra, Kigali, Rwanda. • IMF. 2017. <i>Rwanda: Staff Report for the 2017 Article IV Consultation, Seventh Review under the Policy Support Instrument, and Second Review under the Standby Credit Facility</i>. Washington, DC. • MINECOFIN. 2017. <i>Budget Framework Paper 2017/2018–2019/2020</i>. Kigali, Rwanda. • MINECOFIN budget data (2014–2017). • NISR (National Institute of Statistics of Rwanda). 2017. <i>GDP National Accounts 2016</i>. NISR, Kigali, Rwanda. • Audited financial statements of EUCL for FY2014/15 and FY2015/16. • MININFRA. 2015. “Medium-term Generation and Financial Sustainability Plan for Rwanda’s Power Sector.” • EWSA Financial Assessment 2011–2020.
Pillar B: Improve the operational efficiency, affordability, and accountability of electricity service	
B.1 Transition to least-cost and low-carbon energy mix	
<p>Prior Action 1.2: The REG Board of Directors approved the outline of the Sector Development Investment Plan, which is based on the Least-cost Power Development Plan (LCPDP).</p> <p>Prior Action 1.3: MININFRA adopted a resolution requiring the LCPDP to be updated on an annual basis by REG.</p>	<ul style="list-style-type: none"> • Draft LCPDP prepared in August 2017 by REG with technical support from Israeli Electricity Corporation (2017). • Draft LCPDP prepared in 2014 with support from Japan International Cooperation Agency (2014). • MININFRA. 2015. <i>Energy Sector Strategic Plan</i>. MININFRA, Kigali, Rwanda. • Electricity Network Planning and Design Report (SOFRECO, 2013). • AfDB (African Development Bank). 2013. <i>Rwanda Energy Sector Review and Action Plan, Report</i>. AfDB, Tunis, Tunisia.
<p>Prior Action 1.4: 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 analyst; and (iii) the certification on PPP matters of at least two staff of the SID.</p>	<ul style="list-style-type: none"> • World Bank. 2017. “Rwanda: Country Public-Private-Partnerships Diagnostic. An Assessment of Rwanda’s PPP Readiness.” Washington, DC.

Prior Actions	Analytical Underpinnings
B.2 Increase access to affordable and reliable electricity services	
<p>Prior Action 1.5: The REG Board of Directors (i) approved the technical audit of the Government’s approach to electrification; and (ii) and submitted it to MININFRA for its approval.</p> <p>Prior Action 1.6: RURA adopted a new electricity tariff schedule, which includes, <i>inter-alia</i>, time-of-use incentives, demand charges for large consumer, lifeline tariffs for low-volume electricity consumers below 15 kWh.</p> <p>Prior Action 1.7: 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.</p>	<ul style="list-style-type: none"> • World Bank. 2016. <i>Who Uses Electricity in Sub-Saharan Africa?</i> Washington, DC. • EDCL (Energy Development Company Limited). 2016. <i>Impact Evaluation of the Rwanda Electricity Access Scale-up (EARP) and Sector Wide Approach (SWAp) Development Project.</i> Kigali, Rwanda. • World Bank, IEG (Independent Evaluation Group). 2014. <i>World Bank Group Support to Electricity Access, FY2000–2014.</i> World Bank/IEG, Washington, DC. • World Bank. 2014. <i>From the Bottom Up: How Small Power Producers and Mini-Grids Can Deliver Electrification and Renewable Energy in Africa.</i> Washington, DC. • World Bank. 2014. <i>Scaling Up Access to Electricity: The Case of Rwanda.</i> Washington, DC. • World Bank. 2012. <i>Institutional Approaches to Electrification: The Experience of Rural Energy Agencies/Rural Energy Funds in Sub-Saharan Africa.</i> Washington, DC. • ESMAP (Energy Sector Management Assistance Program). 2012. <i>Rwanda - Extending Access to Energy: Lessons from a Sector-Wide Approach (SWAp).</i> ESMAP, Washington, DC. • Castalia. 2009. “Rwanda Electricity Sector Access Programme - Volume I: Investment Prospectus.” Washington, DC. • World Bank/IEG. 2008. <i>The Welfare Impact of Rural Electrification: A Reassessment of the Costs and Benefits.</i> World Bank/IEG, Washington, DC.
<p>Prior Action 1.8: The Rwanda Standards Board issued and published in the Official Gazette the national standard consistent with the standard 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.</p>	<ul style="list-style-type: none"> • Bloomberg New Energy Finance and Lighting Global/World Bank Group. 2016. <i>Lighting Africa Market Trends Report.</i>
B.3 Improve accountability and transparency of REG	
<p>Prior Acton 1.9: 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; (ii) and approved the roadmap towards compliance with IFRS.</p>	<ul style="list-style-type: none"> • World Bank. 2017. <i>Regulatory Indicators for Sustainable Energy.</i> Washington, DC. • Audited financial statements of EUCL for FY2014/15 and FY2015/16.

Prior Actions	Analytical Underpinnings
B.4 Improve operational efficiency and quality of electricity services	
<p>Prior Action 1.10: 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.</p> <p>Prior Action 1.11: 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 a competitive hiring process for the appointment of a new REG CFO.</p>	<ul style="list-style-type: none"> • IHS Energy. 2017. <i>Powering Development: Strategic Audit of Rwanda’s Electricity Sector</i>. Kigali, Rwanda. • Indra/Minsait. 2017. <i>REG’s Strategic Plan 2017–2027 and EDCL and EUCL Business Plans 2017–2020</i>. Minsait by Indra, Kigali, Rwanda. • MINECOFIN. 2017. <i>Energy Sector: Forward Looking JSR for FY 2017/18</i>. Kigali, Rwanda. • MININFRA. 2016. <i>Energy Performance Report / Backward Looking JSR For FY2015/16</i>. Kigali, Rwanda. • MININFRA. 2015. <i>Energy Performance Report / Backward Looking JSR For FY2014/15</i>. Kigali, Rwanda. • Energy Sector Functional and Organizational Design Report (2014). • “Electricity and water and sanitation sectors in Rwanda: a proposed reform to achieve sustainable development” - PowerPoint Presentation (2013).

4.3 LINK TO CPF, OTHER WORLD BANK OPERATIONS, AND THE WORLD BANK GROUP STRATEGY

83. **The focus on energy by this program is directly aligned with the most recent Rwanda Country Partnership Strategy FY2014–2018 (Report No. 87025-RW).** The series contributes directly to Theme 1: “Accelerating economic growth that is private-sector driven and job-creating.” Under this theme, energy is highlighted as the key sector for World Bank support because increased access to electricity/energy services is core to both increased private sector investment and improved social welfare.

84. **The series is aligned with the World Bank’s twin goals, the IDA18 special themes, and the World Bank’s energy sector strategy.** Increased access to reliable and affordable electricity supply lowers the cost of doing business, promotes job creation, improves citizens’ connectivity and access to opportunity, and strengthens resilience to climate change. Through these effects, the DPO is aligned with the World Bank’s twin goals of reducing poverty and promoting shared prosperity, and supports two of the IDA18 themes and priorities (job creation, economic transformation, and climate change). The proposed program follows the strategy laid out in the World Bank’s Energy Directions Paper (2012), which presents the World Bank’s sector strategy for helping client countries secure affordable, reliable, and sustainable energy supply needed to meet the World Bank’s twin goals of eliminating extreme poverty and boosting shared prosperity.

85. **The series underpins the World Bank’s role as a major strategic partner in Rwanda’s electricity sector development and actively supporting development, implementation, and monitoring of the RES.** The World Bank is the current co-chair of the Energy Sector Working Group and, through different operations, has supported the Government’s recent reforms of the sector structure, the utility, asset and liability evaluation, capacity needs assessments, capacity strengthening, and financial viability of the utility. The World Bank has also advised the Government in formulating its recently adopted RES. It has been the leading donor to the Energy Access Rollout Program through the IDA-financed EASSDP (P111567), which has improved access to reliable and cost-effective electricity services to over 216,000 households and 220 public institutions, and the IDA-financed RESSP (P150634), which will provide electricity access to an additional 72,000 households. The DPO series further deepens the strategic partnership between the Government of Rwanda and the World Bank in the energy sector.

86. **The series supports an enabling environment for private sector participation across the sector value chain by strengthening the offtaker, ensuring competitive procurement of new generation capacity, and attracting credible solar companies in the off-grid space.** Implementation of actions under Pillar B of the series will improve the operational performance and enhance the financial viability of REG in a sustainable manner. Financial creditworthiness of this company is the key enabler of private investments to implement the generation projects identified in the LCPDP under the independent power producer scheme, through long-term power purchase agreements having EUCL as the offtaker. In addition, private investments in new transmission systems in the LCPDP that are needed to connect generation plants with main consumption centers could be implemented through long-term contracts for construction of infrastructure and provision of transmission services, also having EUCL as the purchaser. Further, implementation of actions under Pillar B of this series supports the adoption of quality standards of off-grid solar systems, thus creating a conducive environment for credible private companies to enter the Rwandan off-grid market and provide energy services to consumers who are at the bottom of the pyramid. In summary, the series creates space for the private sector as a partner in the achievement of the Government's overarching goals in expansion of generation capacity and energy access.

87. **The policy and regulatory reform program supported under this DPO is complemented by existing investment operations.** The RESSP, approved in 2015, supported the implementation of a comprehensive MIS at REG and strengthened the capacity of the utility for using the MIS effectively. Actions taken by the Government under the proposed program include ensuring that the MIS is used effectively and deepens REG's work in improving efficiency, transparency, and accountability. The Rwanda Renewable Energy Fund (P160691), approved by the Board in June 2017 and financed by the Scaling-up Renewable Energy Program, will facilitate private sector participation in off-grid electrification through a financial intermediary facility. The proposed DPO program directly facilitates implementation of the facility, especially the development of small mini-grids.

4.4 CONSULTATIONS AND COLLABORATION WITH DEVELOPMENT PARTNERS

88. **Rwanda assigns high priority to policy consultations with stakeholders and development partners, including on the energy policy actions proposed under the DPO.** The Government places high priority on aid coordination and effectiveness and there is a particularly high level of donor coordination and engagement in the energy sector. Regular meetings to coordinate support are held under the umbrella of the Energy Sector Working Group—the main coordination body among key sector stakeholders that includes the Government, donors, civil society organizations, and the private sector—which is currently co-chaired by the World Bank. The policy actions taken under the DPO program have been consulted extensively in the Sector Working Group and other forums. Progress on the utility reforms has been consistently discussed between the development partners and the REG CEO, with the last joint meeting held on July 6, 2017. A MININFRA-led workshop was held on July 14, 2017, to discuss standards for solar systems, while an RDB-led workshop on improving the capacity of SID was held on October 5, 2017. The Government program supported by the DPO series was presented and discussed with the development partners on September 14, 2017, and the development partners endorsed the proposed program.

89. **The World Bank is collaborating closely with development partners in the energy sector.** The European Union (EU) is currently implementing a US\$156 million budget support operation (grant) that promotes, among others, off-grid sector policy actions and energy sector transparency. Lessons from the budget support are included in the proposed operation. In addition, the EU is funding a bulk metering project within EUCL, which will help the utility determine where the losses on the network take place and,

complementing the World Bank-funded RPP, will go a long way in reducing commercial losses. Energizing Development is complementing the World Bank effort in dialogue on off-grid electrification. AfDB, the BTC, KfW and Arab funds are co-funding the EARP electrification projects and are complementing the World Bank dialogue on sustainable electrification, while Power Africa is also complementing the World Bank's dialogue on expanding generation in line with the LCPDP principles.

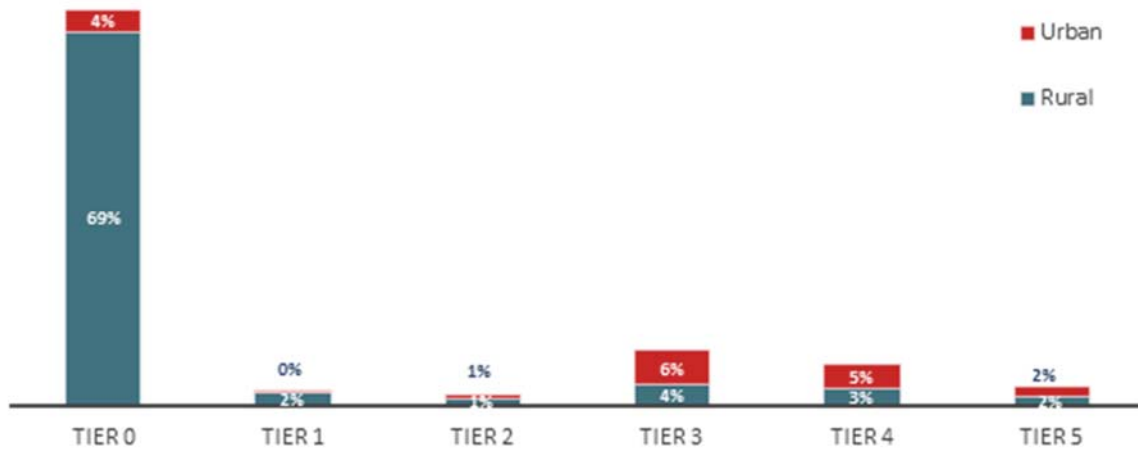
5. OTHER DESIGN AND APPRAISAL ISSUES

5.1 POVERTY AND SOCIAL IMPACT

90. **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.** Figure 7 shows how electrification is primarily a rural challenge: 77 percent of the urban population is electrified and their access is concentrated in higher-access tiers (corresponding to higher levels of service). By contrast, 84 percent of the rural population has no access to electricity (Tier 0) 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 Tiers 1–2 service, are more common in rural areas. Off-grid access to electricity holds the potential to benefit rural households in particular but is low throughout the country and is mostly concentrated in rural areas.

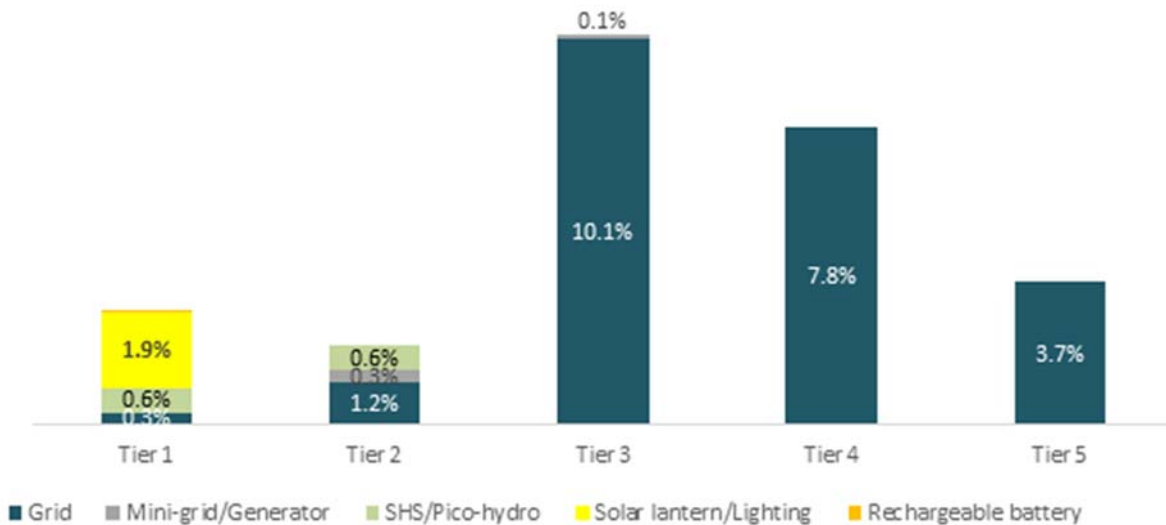
91. **Expanding electricity access is expected to have significant positive impacts on households' social and economic well-being, which have been demonstrated for Rwanda's electrification program by a recent impact evaluation of grid-based electrification.** As part of the broader commitment by the World Bank to enhance the development impact of the resources provided to recipient countries, the ongoing EASSDP was one of four energy projects that were selected in the Africa Region for impact evaluation. 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 from 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. A Difference-in-Differences analysis intended to distill the sole effect of electrification from other factors showed that the effect of electricity on most of the household welfare indicators is positive and significant. The impact is found to have come through increased income and consumption spending, quality and value of houses, and asset creation, which could be interpreted as an improvement in well-being. 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 also has a positive impact on increasing the number of hours worked per day. It has an impact, as well, on education of children (number of hours studied at home per day after sunset for schooling children) and time used for tutoring children.

Figure 7. Electricity Access for Urban and Rural Households, by Tier



Source: Rwanda MTF Survey Report 2017 (data from 2016).
 Note: See footnote 6 for a definition of access tiers under the MTF.

Figure 8. Total Share of Households with Access (Tiers 1–5), Split by Technology



Source: Rwanda MTF Survey Report 2017 ((data from 2016).

92. **The promotion of off-grid solutions for rural households under the DPO 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 solution for these households (see Figure 8, which shows that off-grid solutions are used by Rwandese households with access up to Tier 2). The Government’s measures to strengthen the off-grid solar market, including Prior Action 1.8 under this operation, aim to reduce barriers to the adoption of off-grid solar solutions.

93. **The tariff revision (Prior Action 1.6) and the new connection policy (Prior Action 1.7) 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 (that is, electricity is affordable for the top 30 percent and unaffordable for the lowest 70 percent).²² 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 households with monthly consumption up to 15 kWh (the average monthly consumption of households in Rwanda was an estimated 35 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.

94. **Gender.** The Government has shown strong political will and target-driven gender policies with, for example, EDPRS-II focused on sector strategies that enable women and men to participate, access, control, and benefit equally from growth processes in a way that recognizes their different needs with regard to access to finance, exposure to gender-based violence, and control of assets. However, female-headed households are, on average, more likely to be poorer than male-headed ones even though the percentage of poor female-headed households has decreased from 66 percent in 2000/01 to 47 percent in 2010/11.²³

95. **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. 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.

96. **The Government's electrification program, which will be affected by the reforms to framework conditions implemented under this DPO, includes World Bank-funded projects, such as the Renewable Energy Fund (REF), that have adopted approaches to maximize gender benefits and other socioeconomic benefits during project implementation.** The focus of the gender actions under the DPO will be on (a) the inclusion of specific gender and citizen engagement actions under the NEP under Trigger 2.7; (b) analysis and actions to address gender and poverty dynamics linked to obtaining electricity access,

²² This estimate is based on household consumption expenditure from the EICV 4 (2013/14) and applies the definition used by the World Bank's Multi-Tier Framework for Measuring Energy Access (<https://www.esmap.org/node/55526>). The MTF defines affordability as the ability of households to buy 365 kWh per year for no more than 5 percent of annual household income. At the 2016 tariff, 365 kWh per year cost RWF 66,430 per household per year, meaning that electricity would be considered 'affordable' for any household with income above a threshold of RWF 1.329 million, which is near the average for the fourth quintile.

²³ NISR (National Institute of Statistics of Rwanda). *The Evolution of Poverty in Rwanda from 2000 to 2011: Results from the Household Surveys*.

http://eeas.europa.eu/archives/delegations/rwanda/documents/press_corner/news/poverty_report_en.pdf.

for example, by using women's groups as community mobilizers or tailored connection repayment schemes for female- and male-headed households under Trigger 3.8; (c) collection of sex-disaggregated information by GIS unit under Trigger 2.13; and (d) specific HR actions focused on gender equality issues with regard to recruitment mechanism, collective bargaining policies, employment targets, sexual harassment, and so on under Trigger 2.14. A gender specialist is part of the team and progress on gender aspects of the program will be closely monitored.

97. **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 quality of lighting and indoor air quality, which are expected to lead to better education, health, and public security, especially for women and children, as well as improving women's access to IT and communications.

98. **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 IBMS will support the processes and activities for effective and fast attention and resolution (service restoration) of customers' complaints related to outages and other incidents affecting the quality of electricity supply.

5.2 ENVIRONMENTAL ASPECTS

99. **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 (see Annex 4). Rwanda has in place adequate environmental controls and legislations 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 TA to take into account climate risks and opportunities and with land policy TA to review sustainable land management practices.

100. **MININFRA recently completed a Strategic Environmental Assessment of the energy sector (2015), with support from the EU, the findings of which are being incorporated into MININFRA's Energy Sector Strategic Plan 2017/18–2023/24 and are reflected in its operational policies.** MININFRA, in collaboration with REMA, has also prepared Strategic Environmental and Social Assessment and sector guidelines for Environmental Impact Assessment for hydropower development projects in Rwanda.

101. **Greening the energy sector is a core element of Rwanda's NDC under the Paris Agreement, and the program supports all three NDC priority mitigation actions in the power sector (see also Annex 6 for details).** Rwanda's NDC prioritizes (a) increase in the share of new grid-connected renewable capacity compared to fossil fuels (supported by the LCPDP under Prior Actions 1.2, 1.3, and 1.4); (b) the installing of solar PV in rural communities (supported by Prior Actions 1.5, 1.8, and Trigger 2.10); and (c) increases in energy efficiency through demand-side measures and grid-loss reduction (supported by Prior Actions

1.1, 1.6, and 1.10). The fourth NDC Priority Mitigation Action in energy relates to biofuels and is, therefore, outside the scope of this DPO series.

102. **Net positive environmental effects are expected from improved sector planning (Prior Actions 1.2, 1.3, and 1.4); the new tariff structure (Prior Action 1.6); promotion of the off-grid solar market (Prior Actions 1.5 and 1.8); and reduced system losses (Prior Action 1.10).** 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. Off-grid solar market development will reduce emissions from kerosene and other liquid and solid fuels currently in use by households. Reduced commercial losses reduction will mitigate GHG and pollutant emissions by reducing the demand for power generation.

103. **The expansion of the off-grid solar market, which entails certain environmental risks relating to the disposal of batteries and solar panels, is supported through a separate Investment Project Financing (the Renewable Energy Fund), under which a number of measures are taken to ensure the environmental soundness of the off-grid access program.** Under the recently approved project, MININFRA will work with REMA to develop a specific environmental code of practice as a guidance on the approach for the collection, transport, storage, and disposal of spent batteries, with the aim of ensuring that risks to the environment and human health are prevented or mitigated.

5.3 PFM, DISBURSEMENT, AND AUDITING ASPECTS

104. **The main objective of the PFM is ‘to ensure efficient, effective, and accountable use of public resources as a basis for economic development and poverty eradication through improved service delivery’.** The Government embarked on comprehensive PFM reforms years ago, with the comprehensive PFM Reform Strategy 2013–2018 to advance reforms. PFM systems and processes of the Government have both strengths and challenges as demonstrated in recent PFM diagnostic reports.²⁴ The strengths of the PFM system include (a) the simplified public financial guidelines for chief budget managers, which provide clear descriptions for the various PFM processes;²⁵ (b) the orderly, participatory, and transparent planning and budget preparation process; (c) a strong financial management and procurement legal framework; and (d) the progressive rollout of a procurement system. On the other hand, a number of challenges remain, including (a) small number of suitably qualified PFM specialists to handle PFM functions coupled with turnover of the few trained staff; (b) a relatively recent and undeveloped internal audit; (c) internal control weaknesses; and (d) weaknesses in expenditure management. The World Bank-financed Public Sector Governance Program for Results (P149095) supports the strengthening of the PFM.²⁶ The recent supervision mission of the program indicated satisfactory progress in the improvement of the PFM system in areas related eProcurement, design of the PFM learning and development strategy, and number of qualified PFM staff and financial reporting. Nevertheless, the revision of the Internal Audit structure to improve the function effectiveness was delayed.

²⁴ Such as the Public Expenditure and Financial Accountability 2007 and 2010 assessments, sector public expenditure review reports, public expenditure tracking survey reports, and independent mid-term and end-term evaluations of the PFM Reform Strategy (2008–2012).

²⁵

http://www.minecofin.gov.rw/fileadmin/templates/documents/Fiscal_Decentralisation_Unit/Fiscal_Decentralization_Documentation/Interim_PFM_Guidelines.pdf.

²⁶ <http://www.worldbank.org/projects/P149095?lang=en>.

105. **An assessment of the systems and processes for dealing with fraud and corruption issues also shows that Rwanda has adequate institutional, organization, and legal frameworks for controlling fraud and corruption.** Rwanda further strengthened the legal frameworks in 2013 with the amendment of the law to allow the Office of the Ombudsman to prosecute cases of corruption, though there is a transition to enable the Office of the Ombudsman to be properly prepared to take over prosecution of corruption cases from the National Public Prosecution Authority. Rwanda also passed the Whistle Blowers Protection Act, 2013.

106. **Procurement.** Rwanda has an effective system for prescribing the rules and procedures by which public procurement should be carried out, for training in the requisite competencies and for monitoring and enforcing compliance. The Rwanda Public Procurement Law (Law No. 12 of 2007) was passed in March 2007 and revised in 2013 (Law No. 5 of 2013) and includes the main expected features of a well-regulated public procurement system. The fundamental principles of public procurement, as stated in the Procurement Law (Article 4) to be transparency, competition, economy, efficiency, fairness, and accountability. Procurement compliance is actively enforced by the Rwanda Public Procurement Authority through a program of procurement audits, carried out in accordance with an internal control and audit manual. In addition to the program of procurement audits, procurement activities and contract award proposals are reviewed by a National Independent Review Panel upon complaint by a dissatisfied bidder. Thus, the business community is taking advantage of its right to challenge the decisions of procuring entities, and the procuring entities are aware that any departure from the law or bias and unfairness in evaluation and contract award may be subject to challenge.

107. **The Government also aims to implement a full-fledged e-Procurement system for use by its central and local government entities, as part of its procurement modernization.** Once implemented, the system will be a proven solution and accessible over the Internet by all government entities and the business community. It will also provide ready access for buyers and sellers to create and approve purchasing requisitions, placing purchase orders and receiving goods and services, and online invoicing and payment.

108. **Fiscal transparency.** The Central Government budget and all budget agencies' budgets as approved by the Parliament are made public on MINECOFIN's website.

109. **Disbursement.** The Recipient of DPO 1 is the Republic of Rwanda, represented by MINECOFIN. A single-tranche DPO in the amount of SDR 88.5 million (US\$125 million equivalent) will follow the World 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. Upon notification by IDA DPO 1 effectiveness, and with the submission by the Recipient of a withdrawal application, the proceeds of the operation will be deposited into a foreign currency account designated by the Recipient that forms a part of the country's foreign exchange reserves at the National Bank of Rwanda (BNR). Within two business days, the BNR will credit the Rwanda franc equivalent of the proceeds to the consolidated account maintained on behalf of the Government, which finances budgeted expenditures. Disbursements will not be linked to specific purchases, and no procurement requirements will be necessary. However, the proceeds of the IDA financing cannot be used for ineligible expenditures (that is, to finance goods and services from the IDA's standard negative list as reflected in the Financing Agreement). If the Association determines, at any time, that an amount of the financing was used to make a payment for an excluded expenditure, the Recipient shall, promptly upon notice from the Association, refund an amount equal to the amount of such payment to the Association. Amounts refunded to the Association upon such request shall be cancelled.

110. **Internal control at the BNR.** The last audit report of FY2015/16 published by the BNR indicated that the independent private audit firm opinion on financial statements is unqualified (clean). Furthermore, no significant issues are noticed in the management of the World Bank-financed projects. Designated Accounts at the BNR are held in U.S. dollars.

111. **Reporting and audit.** The Recipient will report to IDA on the amounts deposited in the foreign currency account and credited in local currency to the budget management system with an indication of the exchange rate applied. The Deputy Accountant General in charge of Treasury will be notified accordingly. The BNR will not impose any charges or commissions on the Government for these transactions. The conversion from U.S. dollar to Rwanda franc will be based on the prevailing exchange rate on the date that the funds are credited to the consolidated account. The Government, through MINECOFIN, will (a) provide written confirmation within 30 days to the World Bank that an amount equivalent to the financing proceeds from the World Bank has been credited to the consolidated account, with an indication of the exchange rate applied; (b) provide evidence that the Rwanda franc equivalent of the financing proceeds was recorded as financing for government budget; and (c) ensure that the Rwanda franc equivalent of the financing proceeds is subject to controls to ensure its use for eligible budgeted public expenditures only. IDA reserves the right to request the Recipient to audit the foreign currency deposit account through agreed terms of reference.

5.4 MONITORING, EVALUATION, AND ACCOUNTABILITY

112. **The DPO policy and results matrix (see Annex 1) include selected results indicators of the proposed program.** Most triggers for DPO 2 and DPO 3 and results indicators have been defined and agreed upon. Exceptions include triggers where the exact nature of the policy or institutional action is dependent on the outcomes or prior actions of DPO 1. The exact language for these triggers will be defined during the preparation of DPOs 2 and 3. Exceptions also include results indicators where the target values depend on the Government's targets set under EDPRS-III (to be finalized by end-2017) or where accurate data will only become available once REG has fully commissioned its MIS and the corresponding performance indicators (to be expected by mid-2018). These results indicators will be finalized during the preparation of DPO 2.

113. **A working group has been formed to monitor progress toward the prior actions, triggers, and results indicators.** Monitoring the progress toward the achievement of the program's objectives is the responsibility of the line ministry, MININFRA, with support from REG and its subsidiaries. To facilitate the process, MININFRA has established a working group with representatives from MINECOFIN, MININFRA, REG, and REG's subsidiaries.

114. **Grievance redress.** Communities and individuals who believe that they are adversely affected by specific country policies supported as prior actions or tranche release conditions under a World Bank Development Policy Operation may submit complaints to the responsible country authorities, appropriate local/national grievance redress mechanisms, or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address pertinent concerns. Affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS),

please visit <http://www.worldbank.org/GRS>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

6. SUMMARY OF RISKS AND MITIGATION

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

116. **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 (for example, the CEO of REG, Prior Action 1.11). Moreover, the Government has engaged RURA, an independent sector regulator²⁷ with a track record of independent tariffs decisions and utility performance reviews, in the program development and implementation.

117. **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.

118. **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 DPO 1 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 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

²⁷ RURA was established in 2001 by Law No. 39/2001; its independence was strengthened further in 2013 by Law No. 09/2013 of 01/03/2013. RURA reports to the Office of the Prime Minister and coordinates with line ministries responsible for each regulated sector in executing its functions.

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 SP sector (a total of nine operations over 2009–2017).

119. **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 project 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 TA support provided through ongoing investment projects. To further strengthen implementation capacity, the World Bank is providing additional World Bank-executed TA, including the financing of experts to coach and mentor the new staff in the aspects of utility operations and management; additional technical advisers will be provided to MININFRA and REG, if the need arises. 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.

120. **Stakeholder risks.** As explained in the technical design risks section, 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.

121. **Climate risks.** Due to Rwanda's reliance on hydropower for a significant share of generation capacity (currently 48 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.

Table 10. Summary Risk Ratings

Risk Categories	Rating (H, S, M, or L)
1. Political and governance	H
2. Macroeconomic	M
3. Sector strategies and policies	H
4. Technical design of project or program	S
5. Institutional capacity for implementation and sustainability	S
6. Fiduciary	M
7. Environment and social	M
8. Stakeholders	S
9. Climate	M
Overall	S

Note: H = High; S = Substantial; M = Moderate; L = Low.

ANNEX 1: POLICY AND RESULTS MATRIX

Prior Actions and Triggers			Results
Prior Actions under DPO 1	Triggers for DPO 2	Triggers for DPO 3	
Pillar A: Contain fiscal impact of the electricity sector			
<p>Prior Action 1.1: 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.</p>	<p>Trigger 2.1: The REG Board approves the results of an efficient revenue requirement study, piloting the use of efficiency benchmarks in the calculation of the revenue requirement trajectory, and submits the results to MININFRA for presentation to the Economic Cluster.^a</p> <p>Trigger 2.2: MININFRA adopts options to achieve energy sector fiscal sustainability and reduce explicit and implicit Government subsidies in the medium term and submits the results to the Economic Cluster.</p>	<p>Trigger 3.1: The Economic Cluster approves a medium-term trajectory for fiscal transfers to REG, with the aim to gradually reduce Government subsidies to the sector.</p>	<p>Results Indicator A1:</p> <p>Contain electricity subsidies^b as percentage of GDP:</p> <ul style="list-style-type: none"> • Baseline (FY2016/17): 1.4% of GDP. • Target (FY2019/20): Not more than 1.4% of GDP. • A target for FY2020/21 will be defined by DPO 2, after the Government has approved its revised Medium-Term Fiscal Framework.

Note: a. The Economic Cluster is a subgroup of the Cabinet formed for the effective implementation and monitoring of EDPRS priorities. It includes the Ministers of Natural Resources; Agriculture and Animal Resources; Trade, Industry, and East African Community Affairs; Finance and Economic Planning; Infrastructure; and Employment Promotion.

b. Here, Government subsidies are defined as budget transfers to the electricity sector as recorded in the official Government budget, including transfers for investment and operational expenditures.

Prior Actions and Triggers			Results
Prior Actions under DPO 1	Triggers for DPO 2	Triggers for DPO 3	
Pillar B: Improve the operational efficiency, affordability, and accountability of electricity service			
<i>B.1 Transition to least-cost and low-carbon energy mix</i>			
<p>Prior Action 1.2: The REG Board of Directors approved the outline of the Sector Development Investment Plan, which is based on the Least-cost Power Development Plan (LCPDP).</p> <p>Prior Action 1.3: MININFRA adopted a resolution requiring the LCPDP to be updated on an annual basis by REG.</p> <p>Prior Action 1.4: The Rwanda Development Board (RDB) strengthened the capacity of its Strategic Investment Department (SID)^c through (i) organizational restructuring of said department; (ii) the appointment of at least one PPP analyst; and (iii) the certification on PPP matters of at least two staff of the SID..</p>	<p>Trigger 2.3: The Economic Cluster approves new generation capacity targets for the electricity sector in the National Strategy for Transformation for the period 2017–2024 that are consistent with the LCPDP.</p> <p>Trigger 2.4: The RDB develops, approves, and publishes new procedures for competitive procurement of private sector-owned energy infrastructure, in pursuance of the PPP Law of 2016.</p> <p>Trigger 2.5: MININFRA endorses new draft legislation for renewable energy and submits it to the Economic Cluster for approval.</p>	<p>Trigger 3.2: The REG Board approves an updated LCPDP.</p> <p>Trigger 3.3: The Cabinet approves new draft legislation for renewable energy.</p> <p>Trigger 3.4: MININFRA approves additional policy or institutional measures to implement the LCPDP (to be identified during preparation of DPO 3).</p> <p>Trigger 3.5: RURA approves the regulatory framework for cross-border electricity trade.</p>	<p>Results Indicator B1: 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:</p> <ul style="list-style-type: none"> • Baseline (September 2017): No. • Target (December 2020): Yes. <p>Results Indicator B2: Initiate competitive procurement processes to implement investments identified in the LCPDP:</p> <ul style="list-style-type: none"> • Baseline (September 2017): 0. • Target (December 2020): at least 1.
<i>B.2 Increase access to affordable and reliable electricity services</i>			
<p>Prior Action 1.5: 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.</p>	<p>Trigger 2.6: The Economic Cluster approves separate, revised targets for on-grid and off-grid electrification under the National Strategy for Transformation for the period 2017–2024.</p>	<p>Trigger 3.6: The Government approves financing plan for the implementation of the NEP.</p>	<p>Results Indicator B3: Expand electrification rate countrywide (percentage of households):</p>

Prior Actions and Triggers			Results
Prior Actions under DPO 1	Triggers for DPO 2	Triggers for DPO 3	
<p>Prior Action 1.6: RURA adopted a new electricity tariff schedule, which includes, <i>inter-alia</i>, time-of-use incentives, demand charges for large consumers, lifeline tariffs for low-volume electricity consumers below 15 kWh.</p> <p>Prior Action 1.7: MININFRA approved a new connection policy that eliminates up-front payment of the full connection fee and allows said connections fee to be paid over time.</p> <p>Prior Action 1.8: 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 Standards Requirements for Solar home systems to support off-grid standards enforcement.</p>	<p>Trigger 2.7: The REG Board approves the National Electrification Plan (NEP), which identifies principles for investments to achieve the Government’s access targets in a more efficient manner, and submits it to MININFRA for approval.</p> <p>Trigger 2.8: MININFRA adopts procedures for implementing investments in on-grid and off-grid electrification, as defined in the NEP, and approves a grid extension plan prepared in full accordance with the least-cost options, as defined in the NEP.</p> <p>Trigger 2.9: The Government takes further policy and institutional actions to ensure electricity access remains affordable for poor households (to be identified during preparation of DPO 2).</p> <p>Trigger 2.10: MININFRA approves the procedure for simplified procurement of mini-grids under 50 kW and 100 kW, consistent with the new PPP Law and the simplified licensing framework.</p>	<p>Trigger 3.7: MININFRA takes further policy and institutional actions to ensure timely implementation of the NEP (to be identified during preparation of DPO 2).</p> <p>Trigger 3.8: The Government takes further policy and institutional actions to ensure electricity access remains affordable for poor households (to be identified during preparation of DPO 3).</p>	<ul style="list-style-type: none"> • Baseline (June 2017): 40.7% (29.7% on-grid and 11% off-grid) • Target (December 2020): 55% (38% on-grid and 17% off-grid) <p>Results Indicator B4: Expand electrification rate among rural households (percentage of households):</p> <ul style="list-style-type: none"> • Baseline (June 2017): 16% • Target (December 2020): Target values to be determined during the preparation of DPO 2, using results of National Electrification Plan

Prior Actions and Triggers			Results
Prior Actions under DPO 1	Triggers for DPO 2	Triggers for DPO 3	
B.3 Improve accountability and transparency of REG			
<p>Prior Action 1.9: 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.</p>	<p>Trigger 2.11: REG’s annual financial statements are prepared according to IFRS, audited by an independent auditor, and published.</p>	<p>Trigger 3.9: The REG management approves further revisions to its financial procedures to address any qualifications by the independent auditor to ensure that REG’s annual financial statements are prepared in full compliance with IFRS.</p> <p>Trigger 3.10: The REG Board institutionalizes the annual publication of REG’s financial statements within the first two quarters of the following year and distribution to key stakeholders.</p>	<p>Results Indicator B5:</p> <p>Ensure REG’s financial statements are in full compliance with IFRS, their independent audit is without qualifications, and they are published within the first two quarters of the following year and distributed to key stakeholders:</p> <ul style="list-style-type: none"> • Baseline (September 2017): No • Target (December 2020): Yes
B.4 Improve operational efficiency and quality of electricity services			
<p>Prior Action 1.10: 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.</p> <p>Prior Action 1.11: 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.</p>	<p>Trigger 2.12: The REG Board approves a strategy and the related operational procedures for improving commercial customers’ quality of service and the general quality of electricity supply.</p> <p>Trigger 2.13: (i) The REG Board approves a corporate budget that increases staffing and resources for the GIS unit. (ii) REG management revises the operational procedures for new connections to include GIS data collection for all new connections. (iii) REG management pilots the use of GIS data in the identification of grid failures and complaint resolution.</p> <p>Trigger 2.14: The REG Board adopts operational procedures for efficient corporate planning and HR.</p>	<p>Trigger 3.11: The REG Board approves and publishes the independent evaluation of EUCL’s performance.</p> <p>Trigger 3.12: The REG Board adopts operational procedures for efficient procurement and logistics.</p>	<p>Results Indicator B6:</p> <p>Reduce total commercial losses as a percentage of electricity supply:</p> <ul style="list-style-type: none"> • Baseline (2013): 11.95%. • Target (2020): 8.95%. <p>Results Indicator B7:</p> <p>Reduce average duration of interruptions (SAIDI):</p> <ul style="list-style-type: none"> • Baseline and target values to be determined during the preparation of DPO 2, using new monitoring data on quality of service. <p>Results Indicator B8:</p>

Prior Actions and Triggers			Results
Prior Actions under DPO 1	Triggers for DPO 2	Triggers for DPO 3	
			Implement and publish annual customer satisfaction survey. <ul style="list-style-type: none"> • Baseline (2017): No. • Target (2020): Yes.

Note: c. The SID is the former PPP Unit in the RDB.

ANNEX 2: LETTER OF DEVELOPMENT POLICY

REPUBLIC OF RWANDA



MINISTRY OF FINANCE AND ECONOMIC PLANNING
P.O. Box 158 Kigali
Tel: +250 252 575756 Fax: +250 252 577581
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Mr. Yasser El-Gammal
Country Manager for Rwanda
World Bank
Kigali

Dear Mr. Gammal,

RE: Letter of Development Policy for the Rwanda: First Programmatic Energy Sector Development Policy Operation (DPO)

On behalf of the Government of Rwanda, I am requesting a credit of amount United States Dollar one hundred twenty-five Million (US\$ 125 million) from the International Development Association (IDA) for the First Programmatic Energy Sector Development Policy Operation (DPO).

The Government of Rwanda has over the last few years demonstrated its ability to sustain programmatic reform efforts through the nine World Bank Development Policy Operations carried out between (2009-2017) and these include the three consecutive series of World Bank Development Policy Operations in the social protection sector.

Reform Challenges in the Electricity Sector

Rwanda has over the past decade achieved a remarkable reduction in poverty and extreme poverty. The country-defined poverty rate fell from 56.7 percent in 2005/06 to 39.1 percent in 2013/14, while the extreme poverty rate fell from 35.8 percent in 2005/06 to 16.3 percent in 2013/14. Annual GDP growth has been averaged at 7.5 percent in the last decade.

Rwanda has also been the leading reformer among African economies in Doing Business indicators, ranking second in Africa after Mauritius. The long-term goal for Rwanda which being developed in Vision 2050 strategic paper, sets out a clear path for Rwanda to achieve high income status by 2050.

The target is for the country to attain upper middle income country status by 2035 and high income status by 2050 with the intention of providing high quality living standards to all Rwanda citizens by mid-century. For the above target to be achieved, developing the energy sector is very vital considering its role in developing other sectors such as housing and urbanization, manufacturing, agro-processing, mining, tourism and IT services.

Website: <http://www.minecofin.gov.rw>

06 OCT 2017

Kigali,
No. *ZABUWAHICE*



Furthermore, Rwanda committed to achieving the Sustainable Development Goals (SDGs) and the Sustainable Energy for All (SE4ALL) goal both target to provide access to electricity to all Rwandans by year 2030. With these commitments, the continued growth of the energy sector will be essential to stimulate economic and social transformation.

Rwanda's energy sector has in recent years made several developments where the Electricity generation capacity increased from 99 MW in 2010 to 213 MW by May 2017. This accounts for 110 percent increment in the generation capacity. This is attributed to the resource mix that was diversified from Hydro that currently constitutes up to 45 percent of installed capacity, Methane Gas to Power at 14 percent, Peat to Power at 7 percent, thermal (Heavy Fuel Oil & Diesel) at 27 percent, Imports at 3 percent and solar at 4 percent.

Access to electricity has also improved over the past year with an improvement of nine percent on grid in 2010 to thirty-five (35) percent both on grid and off grid in 2017. Though these achievements have been registered, they fall short of medium term targets (EDPRS-II) targets of 70 percent access to electricity and 563 MW of installed capacity by mid-2018.

Though the GDP per capita was at US\$ 730 in 2016, Rwanda is still considered as one of the poorest countries in the world and this is attributed to the infrastructure challenges such as high electricity costs that hinder socio-economic development. The transformation from an economy based on subsistence agriculture to a knowledge economy and middle-income country that is underway, Rwanda needs to electrify over 60 percent of its households and those already connected need the pricing and affordability issues solved.

The rapidly increasing demand, averaging 8 percent over the past five years, has raised the costs for the Government. The high cost of generation is not reflected in the end user tariff and thus necessitates for additional subsidies for it to be affordable. The rapidly expanding generation capacity has resulted in high generation-costs that arises from the costly use of diesel during evening peak hours. Although the gap has reduced over the recent years, the cost of electricity remains higher than the regional and sub-Saharan averages. And as the electricity system expanded, following the new engagement with Independent Power Producers (IPPs) the generation costs will increase and this calls for a tariff that allows cost recovery to ensure that it is fiscally sustainable.

Reform Program in the Electricity Sector

It is against this background the Government would like to develop a reform program (the Program) through the DPO in order to support the fiscally sustainable expansion of electricity services. This shall be achieved through reform measures aimed at (i) containing the fiscal impact of the electricity sector; and (ii) improving the operational efficiency, affordability, and accountability of electricity service. Details of the Program are provided below:

The Program for the energy sector is aligned to the wider national objectives of achieving sustained economic growth, poverty reduction and consolidating macroeconomic stability. These high-level national objectives are set by Rwanda's Vision 2020, which will soon be replaced with Vision 2050. The Program is also anchored in the sectoral goals laid out in the National Strategy for Transformation paper for period 2018-24 that is built against the progress made under the Economic Development and Poverty Reduction Strategy I and II (2008-2017) period.

The Energy sector reform program is integral in fulfilling the commitments under Rwanda's Nationally Determined Contribution (NDC) to the COP 21 Paris Agreement on Climate Change. This Program will support the three NDC priority mitigation actions in the energy sector which include: (i) increasing the share of new grid connected renewable energy capacity compared to fossil fuels; (ii) the installation of solar PV in rural communities; and increase energy efficiency through demand-side measures and grid-loss.

The Government is committed to (a) achieving transparent and accountable sector governance; (b) easing doing business and reducing barriers for the private sector stakeholders; and (c) enhancing engagement of citizens and customers. A results framework has been established to measure progress in the Program. Baseline and target values for each year have been established, against which actual values will be measured annually. Progress towards the objectives of the Program will be monitored by both the Ministry of Infrastructure (MININFRA) and Ministry of finance and Economic Planning (MINECOFIN).

Below are the two pillars the DPO program will be anchored:

Pillar A: Contain the fiscal impact of the electricity sector

Rwanda aims to achieve universal energy access by 2020 and increase electricity generation capacity with aim to achieve affordable and reliable power supply to productive users and households. For this to be achieved significant investment is required in constructing generation plants and expanding the electricity network. A mixture of funding sources is envisioned to be used, including Government budget, development partner support and the private sector. However, reforms are needed to ensure the sector's expansion is carried out in a fiscally sustainable manner and to ensure that the targets in our Medium-Term Fiscal Framework are met.

The Government aims to reduce under this Program, will determine the utility (REG/EUCL)'s efficient revenue requirements and carefully evaluate options to reduce cost of supply, thereby providing the basis for a policy framework to ensure fiscal sustainability of the electricity sector in Rwanda. In adherence due to process and in consultation with stakeholders, measures to address REG's cost recovery shall be made during the Program period. The successful implementation of the Program will ensure that subsidies to REG are contained, at no more than 1.4 percent of GDP by FY2019/20, which is the same percentage level in FY2016/17.

Pillar B: Improve the operational efficiency, affordability, and accountability of electricity service

B.1 Ensure least cost expansion of new generation capacity

Investment decisions must be based on sound planning and projects must be delivered on agreed timelines and flexibility must be built into commercial arrangements to minimize cost of supply. The electricity sector in Rwanda has not yet reached a state of maturity. Considering the bulk of the country's households are still not connected to the national grid and the demand for electricity is increasing significantly (around 8 percent per year over the past five years). Continued investment is required for additional generation capacity to ensure that the increasing demand is met. However, the majority of the costs of new power stations are fixed and payable whether or not the available electricity is consumed and we have to stimulate demand so that surplus of capacity will be a costly burden on the sector. Aligning supply and demand is a core

role of the EDCL and EUCL planning departments, which requires consideration of a number of factors, including the requirement to increase access to the grid, ensuring the long term financial sustainability of the utility, maintaining a reliable supply of electricity, and making electricity more affordable. Further, large-scale generation projects have long lead times (5-10 years), making proper investment planning essential.

Under the Program, a Least Cost Development Plan (LCDP) will be put in place and its annual update made a mandate for REG. The LCDP is a key planning tool and input to the Master Plan, wherein a rigorous demand forecast, a “bottom-up” inventory of potential generation and import projects, and planning of future transmission infrastructures are combined. As connecting new generation projects to users will require the expansion of the existing transmission network, the contribution of grid expansion plans to the overall system costs has to be factored in to identify the most cost effective solutions. The output of the LCDP was recommended to sequence supply investments to ensure long term balance at least cost.

Upon completion of the LCDP, the Government will aim to move from unsolicited proposals to competitive procurement of the investments identified in the LCDP, and to take further measures to facilitate the development of least-cost resources. These include procedures for competitive procurement of private energy investments, new renewable energy resources, and a regulatory framework for cross-border electricity trade, enabling imports of lower supply cost and export of excess capacity thereby optimizing the cost of the energy mix. The long-term vision is for Rwanda to become an active electricity trading partner and potential exporter of electricity to the regional grid network. Increased regional integration will strengthen the networks of connected companies, increase security of supply (with technologies and seasonal changes in neighboring countries working together) and potentially provide Rwanda with an inexpensive source of electricity.

B.2 Ensure access to affordable and reliable electricity services for consumers

Throughout the implementation of the Program, expansion of the grid will continue through the successful Energy Access Roll-out Program (EARP). But expanding the network to reach more remote households presents two important issues: grid expansion brings in increasingly scattered households in difficult terrain, and these households tend to be low income, with low consumption of electricity. More scattered settlements increase the cost of expanding the network. Compounding this, Rwanda has a difficult terrain over which to extend the power grid. As a result, the marginal cost of grid expansion increases the cost of delivering on-grid access targets.

The Government believes that off-grid solutions such as solar home systems (SHS) and mini-grid development will play a key role in the meantime. Off-grid technologies and commercial structures have developed significantly in recent years and now present a viable alternative to grid connections. The Rural Electrification Strategy (RES) published in June 2016 sets out a clear development plan for the off-grid sub-sector. It is expected that 52 percent of all households will be connected to the electricity grid and 48 percent will have their electricity needs met by off-grid solutions by year 2020.

The Government is optimizing its electrification planning to make best use of on-grid and off-grid solutions. A new National Electrification Plan (NEP) will be prepared under the Program, which will define and put in place institutional arrangements, least-cost technical planning, and financing arrangements for investments needed to achieve the ambitious targets set on access to

electricity services. Besides better planning, the Government has reformed the connection policy that eliminates up-front payment and allows the full connection fee to be repaid over time. This policy was designed to improve affordability of electricity, accelerate the on-grid electricity demand and further overcome inefficiencies in electricity connection service delivery.

To increase the affordability of electricity for low-income households, the electricity tariff was reviewed in 2016, with a new tariff regime put in place from January 2017. A number of important changes were made:

A 'life-line' tariff for low-income (low consumption) households has been introduced to make electricity more affordable for the poor and the bottom 40 percent, with the price of electricity up to 15 kWh per month reduced to RWF 89 per kWh (a reduction of 51 percent). The price then increases to RWF 182 per kWh up to 50 kWh per month and RWF 189 per kWh after that.

Customer types were disaggregated and Industrial customers are categorized based on voltage levels, as voltage is the main underlying determinant of the economic cost of service provision. Medium-voltage customers are charged based on active and reactive power to ensure all costs incurred are covered by the tariff paid. Demand charges are now in place for medium-voltage customers to encourage energy-intensive to move demand away from the evening peak and to flatten their demand profile.

The affordability challenge is being monitored following the above-mentioned tariff review and further action will be needed and a commitment to continually review the tariff was made. RURA will monitor the tariff to ensure it is driving the intended consumer behaviors needs thus contributing to improved financial performance in the sector.

Lastly, to ensure that off-grid solar systems maintain on-going functionality and avoid failure and the need for expensive rehabilitation, guidelines and standards have been put in place to ensure that private sector companies sell high-quality products and adhere to their warranty obligations.

B.3 Enhance the accountability and transparency of REG

Financial transparency is critical to ensure accountability of REG to shareholders and citizens. In order to make the sector more attractive to the private sector investment, financial reporting will be improved both at holding and subsidiary levels.

Under the Program, REG is reforming its financial reporting procedures to adopt the internationally harmonized International Financial Reporting Standards (IFRS). From 2018/19 onwards, the financial statements of REG are expected to be IFRS-compliant and receive an audit without qualifications and published within the first quarter of the subsequent fiscal year.

B.4 Improve operational efficiency and quality of electricity services

The Government has set ambitious targets to improve REG's operational performance and aims to make it a leading utility on the continent. This will involve moving maintenance from reactive to proactive and establishing in all employees a sense of ownership and responsibility for identifying and resolving the causes of losses. Extensive, ongoing vocational and management training is fundamental to bring such about. It will also require a shift in how the

implementation of works and regulations are viewed. Processes and organizational culture are to be adapted, with organizational and training specialists required with clear directives from senior management. This represents a new phase in which trust and change management will be increasingly required.

Key objectives of the reforms include loss reduction, enhanced operational efficiency, and improved quality of service. To reduce losses, measures taken by REG to address this problem include the piloting of using bulk meters to accurately measure system losses and developing strategy for reducing commercial losses. The strategy will lay out how to implement a revenue protection program (RPP) targeting EUCL's sales from large to medium customers. Large and medium consumers are currently estimated at 2,200 (less than two percent of the total customer base), but represent half of total sales. The implementation of the RPP will ensure that the billing for these "high value" customers is systematic and accurate according to their full metered consumption. The RPP will protect utility revenues by providing accurate, reliable, and timely billing information, thus promoting greater billing transparency and reduced consumption disputes, while also identifying network theft, which will contribute to a significant reduction/control of commercial losses.

To enhance operational efficiency, REG has completed the competitive hiring of a new CEO and CFO. REG is also overhauling its operational procedures for corporate resource management (including corporate planning, procurement, logistics, HR, and financial management) by adopting an Integrated Business Management Information System (IBMS) to support efficient, transparent and accountable execution of operations in all business areas. The IBMS will consist of an Enterprise Resource Planning System; a Commercial Management System (which will track all commercial activities); and a Distribution Management System, including an Incident Recording and Management System.

To improve the quality of service, REG approved a strategy and the related operational procedures for improving commercial customers' quality of service and the general quality of electricity supply with a fully integrated geospatial information of all its assets into its investment planning and asset management. Its GIS unit has been staffed and will pilot the use of GIS data in the identification of grid failures and complaint resolution as part of completing and publishing an independent performance audit of EUCL through conducting annual customer satisfaction surveys. Further, the plan for the new IBMS includes the full incorporation and systematic use of information systems that supports all the commercial functions, processes and activities for effective fast attention and resolution (service restoration) of customers' complaints related to outages and other incidents affecting quality of electricity supply.

The Government expresses its strong commitment to the electricity sector reform program as outlined in this letter however the execution will require strong decisions and significant mobilization of resources from our development partners, including the World Bank. For this purpose, the Government of Rwanda requests the World Bank support for the Program, as a critical partner for our development agenda.

The Government's commitment to expand the electricity sector in a fiscally sustainable manner, in line with our Medium-Term Fiscal Framework and the targets under National Strategy for Transformation. The Program requires ongoing dynamic policy and institutional reform for which we seek the World Bank's assistance in the form of this policy development operation. We are confident that these reforms will go a long way towards minimizing fiscal risks as we

strive to achieve universal access to electricity by 2020 and make progress towards the Sustainable Development Goals. We therefore submit this Letter of Development Policy to seek support from the International Development Association of the World Bank through this operation. We believe this credit will build on previous support provided by the World Bank through its investment operations, and fully support the comprehensive and ambitious vision for energy sector.

In conclusion, I would like to express my sincere gratitude to the World Bank for its tireless efforts and invaluable support.

Yours sincerely,


Claver GATETE
Minister



Cc:

- Hon. Minister of Infrastructure
- Hon. Minister of State in charge of Economic Planning
- Hon. Minister of State in charge of Energy, Water and Sanitation
- Permanent Secretary and Secretary to the Treasury, MINECOFIN
- CEO, Rwanda Energy Group

ANNEX 3: IMF RELATIONS ANNEX

IMF Press release dated July 12, 2017

IMF Executive Board Completes Seventh PSI Review, Second Review Under the SCF, and Concludes 2017 Article IV Consultation with Rwanda

- Program implementation has been strong, with almost all targets met. Rwanda's adjustment policies are making notable progress in reversing external imbalances.
- Growth slowed in 2016, with recovery expected in 2017–2018 due to strong harvests and domestic production.
- To achieve the country's goal of upper middle income status, it will be important to boost the role for the private sector to serve increasingly as the main engine for growth and investment.

The Executive Board of the International Monetary Fund (IMF) today completed the seventh review of Rwanda's performance under the Policy Support Instrument (PSI)²⁸ and the second review of the arrangement under the Standby Credit Facility (SCF)²⁹. Completion of the second SCF review enables the disbursement of US\$25.06 million (SDR 18.0225 million), bringing total disbursements under the arrangement to SDR 126.16 million, with the remainder being tied to the next and final review.

Requests for an 18-month SCF arrangement with access of about US\$200.49 million (SDR 144.18 million) or 90 percent of Rwanda's quota and to extend Rwanda's PSI-supported program through end-2017 (see [Press Release No. 16/270](#)), were approved by the Board on June 8, 2016. Rwanda's PSI-supported program was originally approved on December 2, 2013 (see [Press Release No.13/483](#)).

Following the Executive Board discussion, Mr. Tao Zhang, Deputy Managing Director and Acting Chair, made the following statement:

"Rwanda has made notable progress in the past two decades, anchored by its carefully-considered development strategy. This includes steady progress on structural transformation, high and inclusive growth, reduced poverty and gender inequality and attractive business environment. This has been reinforced by strong macroeconomic policy management, characterized by strategic public investment in growth-enhancing infrastructure, maintenance of low inflation, and measures to bolster domestic revenue mobilization.

"Responding to adverse global conditions, the authorities took decisive steps to address external imbalances, thereby safeguarding macroeconomic stability and growth over the longer term. Exchange rate flexibility has been the central tool of policy adjustment, with structural reforms to bolster domestic

²⁸ The PSI is an instrument of the IMF designed for countries that do not need balance of payments financial support. The PSI helps countries design effective economic programs that, once approved by the IMF's Executive Board, signal to donors, multilateral development banks, and markets the fund's endorsement of a member's policies (see <http://www.imf.org/external/np/exr/facts/psi.htm>). Details on Rwanda's current PSI are available at www.imf.org/rwanda.

²⁹ The SCF provides financing to low-income countries on concessional terms. For more details, see <http://www.imf.org/external/np/exr/facts/scf.htm>.

production. These policies have already made progress in reducing the deficit in goods and services trade, and should place external balances on a more sustainable path over the medium term. Performance under the SCF arrangement and PSI-supported program has been strong, with almost all program targets and structural measures set through end-March achieved.

“Growth slowed in 2016, due to an extended drought, completion of large investment projects, and adjustment policies. It is expected to recover over 2017–18, with balanced risks to the outlook. Inflation spiked in early 2017 due to a food supply shock, but is now abating.

“Despite the notable achievements, the Rwandan economy remains vulnerable to external shocks. It will be important to rebuild foreign exchange reserve buffers to enhance the country’s resilience. Similarly, to support continued growth-enhancing public investment, the government should ensure that recently-introduced tax incentives to boost domestic production are well-targeted and do not unduly weaken the tax base. To reach the goal of upper middle income status, it will be important to boost the role for the private sector to serve increasingly as the main engine for growth and investment in Rwanda.”

The Executive Board also completed the 2017 Article IV Consultation ³⁰ <https://www.imf.org/en/News/Articles/2017/07/12/pr17274-imf-imf-executive-board-completes-seventh-psi-review-on-rwanda> - ftn3 with Rwanda.

Rwanda has demonstrated strong macroeconomic policy management and implemented an ambitious development strategy that has resulted in high and inclusive growth, lower poverty and more gender equality, and improved living standards. Growth in 2016 was 5.9 percent, down from 2015, but comparing favorably to growth in the subcontinent. A recovery of growth is expected in 2017–18, owing to good rains and expanding domestic production.

A spike in consumer price inflation in early 2017 was driven by food prices: inflation has decelerated as food supply constraints have receded. Rwanda’s external trade deficit was lower than anticipated in 2016, following a strong pick up in goods and services exports, combined with reduced demand for imports.

Building on its successful ‘Vision 2020’ development strategy, the government is drafting a new ‘Vision 2050’ development strategy aimed at reaching upper middle-income status by 2035. Reforms should build on progress achieved, including: continuing to reorient the economy toward higher value-added economic activity; further bolstering gender equality through greater economic inclusion; increasing access to affordable financial services; and fostering the development of domestic securities markets. Main risks to economic growth continue to be weather shocks affecting agriculture, regional security issues, and unexpected shifts in external development assistance.

³⁰ Under Article IV of the IMF’s Articles of Agreement, the IMF holds bilateral discussions with members, usually every year. A staff team visits the country, collects economic and financial information, and discusses with officials the country’s economic developments and policies. On return to the headquarters, the staff prepares a report, which forms the basis for discussion by the Executive Board.

Executive Board Assessment³¹

Executive Directors commended Rwanda for its achievements over the past decades, anchored by an ambitious development strategy. They welcomed the steady progress on structural transformation, high and inclusive growth, reduced poverty and gender inequality, and attractive business environment.

Directors welcomed the decisive steps to address external imbalances. They highlighted that exchange rate flexibility should continue to be the main adjustment tool, and welcomed the reforms to bolster domestic production, which should place external balances on a more sustainable path over the medium term. Directors emphasized that rebuilding reserve buffers will be important to enhance Rwanda's resilience to external shocks.

Directors welcomed improved domestic revenue mobilization in recent years which will help secure future growth-enhancing public investment and reduce donor dependency. However, they encouraged the authorities to balance carefully the benefits to domestic production from recently-introduced tax incentives with potentially adverse effects on domestic revenue mobilization. Against this backdrop, they supported planned tax expenditure analysis to ensure that tax incentives are well-targeted and do not unduly weaken the tax base.

Directors supported the authorities' plan to move to an interest-rate based monetary policy framework. They encouraged the authorities to put in place the preconditions to allow indirect policy instruments to operate, including deepening interbank and domestic debt markets. Directors encouraged measures to provide clear signals about the priorities and directions of monetary policy under the current policy regime to help anchor inflation expectations.

Directors welcomed the steps being taken to advance Rwanda's development strategy. They underscored the importance of boosting the role of the private sector to serve increasingly as the main engine for growth and investment. Directors commended the progress made in improving the business environment and encouraged continued efforts in this regard. They also emphasized the importance of investment in education and vocational training targeted at building skills to meet rapidly evolving labor needs.

Table 3.1. Rwanda: Selected Economic Indicators, 2015–2019^a

	2015	2016	2017	2018	2019
Output and prices					
Real GDP	8.9	5.9	6.2	6.8	7.3
GDP deflator	0.1	4.9	7.4	5.5	4.6
CPI (period average)	2.5	5.7	7.1	6.0	5.0
CPI (end of period)	4.5	7.3	7.0	5.0	5.0
Core inflation (period average) ^b	2.1	4.1	—	—	—
Terms of trade (deterioration, -)	5.3	6.3	6.1	-4.1	3.6
Money and credit					
Broad money	21.1	7.6	13.0	13.2	—
Reserve money	16.2	5.5	10.9	11.1	—
Credit to non-government sector	30.1	7.8	17.9	14.2	—
M3/GDP (percent)	24.9	24.1	23.9	24.0	—

³¹ At the conclusion of the discussion, the Managing Director, as Chairman of the Board, summarizes the views of Executive Directors and this summary is transmitted to the country's authorities. An explanation of any qualifiers used in summing up can be found here: <http://www.imf.org/external/np/sec/misc/qualifiers.htm>.

	2015	2016	2017	2018	2019
Nonperforming Loans (percent of total gross loans)	6.2	7.5	—	—	—
General government budget					
Total revenue and grants	24.7	23.7	22.1	21.9	21.7
Expenditure	29.3	27.4	26.2	25.8	25.6
Primary balance	-0.3	-2.8	-2.9	-2.7	-2.7
Overall balance	-4.6	-3.8	-4.1	-3.9	-3.9
Net domestic borrowing	1.1	0.8	0.0	0.2	0.5
Public debt					
Total public debt including guarantees	36.4	44.5	45.7	47.1	48.7
Of which: external public debt	27.9	35.8	38.1	40.2	42.1
Investment and savings					
Investment	25.9	25.6	24.0	24.6	22.6
Government	12.6	10.6	9.4	9.9	9.5
Nongovernment	13.3	15.0	14.6	14.7	13.1
Savings	8.0	7.1	10.2	9.9	9.3
Government	3.5	3.1	3.0	3.5	3.2
Nongovernment	4.5	3.9	7.3	6.4	6.1
External sector					
Exports (goods and services)	18.4	19.0	20.3	20.6	21.9
Imports (goods and services) ^c	35.6	37.0	33.1	34.3	34.2
Current account balance (including grants)	-13.4	-14.4	-10.2	-11.2	-9.9
Current account balance (excluding grants)	-17.8	-18.5	-13.8	-14.6	-13.3
Current account balance (excluding large projects)	-9.9	-9.9	-10.2	-10.5	-10.3
Gross international reserves					
in billions of US\$	0.9	1.0	1.0	1.0	1.2
in months of next year's imports	3.6	4.1	3.9	3.7	3.9
Memorandum items:					
GDP at current market prices					
Rwanda francs (billion)	5,956	6,618	7,548	8,505	9,544
US\$ (billion)	8.3	8.4	—	—	—
GDP per capita (US\$)	732.0	729.0	—	—	—
Population	11.3	11.5	11.8	12.1	12.8

Sources: Rwandan authorities and IMF staff estimates.

Note: a. All figures are based on the rebased GDP.

b. Defined as excluding fresh products and energy

c. Imports for 2016 reflect purchases of two aircrafts.

ANNEX 4: ENVIRONMENT AND POVERTY/SOCIAL ANALYSIS TABLE

Prior Actions	Significant Positive or Negative Environment Effects	Significant Positive or Negative Poverty, Social, or Distributional Effects
Pillar A: Contain fiscal impact of the electricity sector		
<p>Prior Action 1.1: 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.</p>	<p>No significant positive or negative environmental effects are expected.</p>	<p>No significant positive or negative poverty, social, or distributional effects are expected. Under DPO 2 and DPO 3, the Government is expected to decide on an overall policy framework for the sector to make it financially more sustainable. The World Bank team will work with the Government to ensure that any policy measures taken under this framework will not have significant negative poverty, social, or distributional effects.</p>
Pillar B: Improve the operational efficiency, affordability, and accountability of electricity service		
<i>B.1 Transition to least-cost and low-carbon energy mix</i>		
<p>Prior Action 1.2: The REG Board of Directors approved the outline of the Sector Development Investment Plan, which is based on the Least-cost Power Development Plan (LCPDP).</p>	<p>Net positive environmental effects are expected, because improved planning is expected to improve the utilization of low-cost hydropower and regional electricity exchanges in the electricity mix and reduce the need for expensive and polluting fossil fuel capacity.</p>	<p>No significant positive or negative poverty, social, or distributional effects are expected.</p>
<p>Prior Action 1.3: MININFRA adopted a resolution requiring the LCPDP to be updated on an annual basis by REG.</p>	<p>Net positive environmental effects are expected, because improved planning is expected to improve the utilization of low-cost hydropower and regional electricity exchanges in the electricity mix and reduce the need for expensive and polluting fossil fuel capacity.</p>	<p>No significant positive or negative poverty, social, or distributional effects are expected.</p>
<p>Prior Action 1.4: 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 analyst; (iii) the certification on PPP matters of at least two staff of the SID.</p>	<p>No significant positive or negative environmental effects are expected.</p>	<p>No significant positive or negative poverty, social, or distributional effects are expected.</p>

Prior Actions	Significant Positive or Negative Environment Effects	Significant Positive or Negative Poverty, Social, or Distributional Effects
B.2 Increase access to affordable and reliable electricity services		
<p>Prior Action 1.5: 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.</p>	<p>No significant positive or negative environmental effects are expected.</p>	<p>No significant positive or negative poverty, social, or distributional effects are expected. The recommendations coming out of the audit, if adopted, would make access more cost-efficient. This would make electricity access more affordable for poor households and the bottom 40 percent.</p>
<p>Prior Action 1.6: RURA adopted a new electricity tariff schedule, which, <i>inter-alia</i>, time-of-use incentives, demand charges for large consumer, lifeline tariffs for low-volume electricity consumers below 15 kWh.</p>	<p>Positive environmental effects are expected. 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. The additional residential demand from the lifeline tariff is expected to be very small compared to the effects on industrial demand (currently, the category below 15 kWh per month represents an estimated 3.5 percent of the total electricity demand).</p>	<p>Positive poverty and social effects are expected. The lifeline electricity tariff will make grid-based electricity access more affordable for poor households and the bottom 40 percent. Positive distributional impacts are expected as well, given that the lifeline tariff only applies to very small consumers.</p>
<p>Prior Action 1.7: 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.</p>	<p>No significant positive or negative environmental effects are expected. The additional demand from small consumers resulting from this prior action is expected to be relatively small compared to the total system demand.</p>	<p>Positive poverty and social effects are expected. The new connection policy will make grid-based electricity access more affordable for poor households and the bottom 40 percent.</p>
<p>Prior Action 1.8: 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 Standards Requirements for Solar home systems to support off-grid standards enforcement.</p>	<p>Positive environmental effects are expected. Improved quality of solar products is expected to reduce the share of premature failures and improper recycling of solar products.</p>	<p>Positive poverty and social effects are expected. The lifeline electricity tariff will make grid-based electricity access more affordable for poor households and the bottom 40 percent.</p>

Prior Actions	Significant Positive or Negative Environment Effects	Significant Positive or Negative Poverty, Social, or Distributional Effects
<i>B.3: Improve accountability and transparency of REG</i>		
Prior Action 1.9: The REG Board of Directors (i) endorsed the shift of 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.	No significant positive or negative environmental effects are expected.	No significant positive or negative poverty, social, or distributional effects are expected.
<i>B.4 Improve operational efficiency and quality of electricity services</i>		
Prior Action 1.10: The REG t (i) initiated piloting the use of bulk metering to accurately measure system losses; and (ii) approved the plan commercial losses reduction of EUCL.	Significant positive environmental effects are expected. Reduced commercial losses reduction will mitigate GHG and pollutant emissions by reducing the demand for power generation.	No significant positive or negative poverty, social, or distributional effects are expected.
Prior Action 1.11: 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 a competitive hiring process for the appointment of a new CFO.	No significant positive or negative environmental effects are expected.	No significant positive or negative poverty, social, or distributional effects are expected.

ANNEX 5: DEBT SUSTAINABILITY ANALYSIS

Staff report for the 2017 article iv consultation, seventh review under the policy support instrument, and second review under the standby credit facility—debt sustainability analysis update

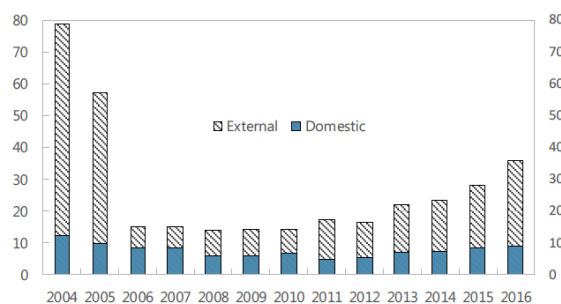
The DSA was prepared jointly by IMF and World Bank staff, in consultation with the authorities.

1. **The World Bank/International Monetary Fund assessment of Rwanda’s DSA indicates continuation of low risk of debt distress.**³² External debt burden indicators remain below ‘risk’ thresholds, except for a small and temporary breach in the baseline of the debt service-to-revenue ratio, and the stress test for debt service-to-exports in 2023, when the eurobond issued in 2013 matures. Recognizing Rwanda’s investment needs on the one hand and its narrow export base and import-dependent growth on the other, the authorities are focused on carefully choosing the highest return projects, financed under the most favorable terms. In the context of the Compact with Africa, the authorities hope to encourage more private investment, leveraging guarantee schemes from multilateral and bilateral development partners and minimizing the Government’s exposure to additional liabilities.

Background

2. **Growth in the Rwandan economy decelerated in 2016.** Real GDP grew by 5.9 percent in 2016, compared to 8.9 percent in 2015, mainly due to the impact of drought on agricultural production, and to a lesser extent the completion of large investment projects in the second half of the year, and adjustment policies intended to address external imbalances. Lower commodity prices put a drag on mining exports. Despite the growth slowdown, imports increased in the first half of the year due to large public and private investment projects, causing an increase in the current account deficit. However, adjustment policies—notably sizeable exchange rate adjustment—lowered the demand for imports and boosted export competitiveness in the second half of the year, such that the deterioration of the current account balance was less than forecast. In 2017, continued suppression of import demand, a levelling off in commodity prices, and robust export volume growth are projected to lead to a reduction of the current account deficit from 14.4 percent of GDP in 2016 to 10.2 percent. Real GDP growth is also projected to recover gradually, reaching 6.8 percent by 2018.

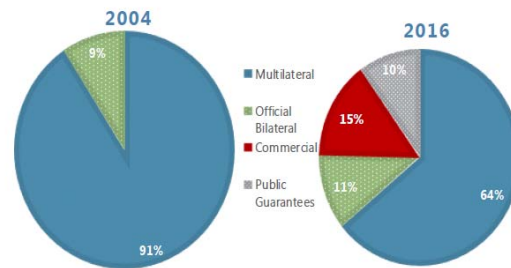
Figure 5.1. Public Debt (Percentage of GDP)



Source: Rwandan authorities and IMF staff calculations.

³² This DSA is an update of the DSA analysis contained in IMF Country Report No. 16/153 (June 2016). The fiscal year for Rwanda runs from July to June; however, this DSA is prepared on a calendar year basis. The results of this DSA were discussed with the authorities and they are in broad agreement with its conclusions.

Figure 5.2. Composition of PPG External Debt (Percentage of GDP)



Source: Rwandan authorities and IMF staff calculations.

3. **Rwanda’s public sector debt has increased with an investment push in recent years but remains comfortable in absolute terms.** At end-2016, the external debt of the public sector stood at 35.8 percent of GDP (Table 5.1). That ratio has increased by 14 percentage points since 2013, reflecting a sustained public investment push, including by external guaranteed debt associated with large investment projects, including expansion of RwandAir and completion of the KCC (figures 5.1 and 5.2).³³ Rwanda’s debt portfolio has been further affected by a shift in the composition of official development assistance away from grants toward concessional borrowing. Looking forward, a new international airport capable of handling more and larger aircraft is under construction, with the Government taking a minority share in a PPP. The project, for which the Government is expected to take on around US\$37 million in external debt over 2017–2019, is included in the DSA.³⁴

Table 5.1. Rwanda: External Public Debt

	2014		2015		2016			
	Billions US\$	Share	Billions US\$	Share	Billions US\$	Share	% GDP	
Multilateral creditors	0.9	1.1	60.6	1.4	61.5	1.7	60.3	21.6
Bilateral creditors	0.2	0.3	13.8	0.3	13.2	0.3	10.7	3.8
Commercial creditors	0.4	0.4	21.9	0.4	18.0	0.4	13.8	5.0
Total (excluding guarantees)	1.6	1.8	96.3	2.1	92.7	2.5	84.8	30.4
Publicly guaranteed debt	0.1	0.1	3.7	0.2	7.3	0.4	15.2	5.5
Total (including guarantees)	1.6	1.8	100.0	2.2	100.0	2.9	100.0	35.8

Source: Rwandan authorities and IMF staff.

4. **Rwanda’s domestic public debt has also increased to develop a broader domestic market in recent years but also remains low in absolute terms.** Domestic public debt was 8.6 percent of GDP at end-2016 (Table 5.2), close to 2 percent higher than in 2013. The increase has been driven by both short-term debt and the issuance of medium-term treasury-bonds for capital market development purposes.

³³ In 2016, new debt associated with the KCC totaled US\$160 million, 80 percent of which was external debt. RwandAir’s continued expansion included US\$171 million in loans for two new aircraft and leases for two other aircraft which, together with associated debt servicing, are included within the public sector in this analysis.

³⁴ Domestic bridge financing by the Government is also included in the DSA, totaling US\$75 million.

Underlying Assumptions

5. **The medium- and long-term macroeconomic framework underlying the DSA is consistent with the baseline scenario presented in the Staff Report for the seventh review of the PSI-supported program.** The main assumptions and projections for key macroeconomic variables are summarized in box 5.1 and Table 5.3. The main differences between the current assumptions and those underlying the last DSA in 2015 are the following: (a) GDP growth projections have been revised slightly down in 2018–2019; (b) a slightly higher fiscal deficit is assumed due to lower projected revenues serving to increase debt and debt service measured against revenue; and (c) there is an improvement in the current account balance throughout the projection period, due to short- and longer-term adjustment policies. The reduction in external imbalances reflects, in large part, a reassessment of trade growth given stronger than expected adjustment to date—at 14.4 percent of GDP, the trade deficit was significantly lower than previously forecast in 2016, and improvements continued into Q1 2017 with contracting import volumes—particularly for consumer goods and construction goods—and robust nontraditional export volume growth, reflecting implementation of policies to encourage import substitution and promote export diversification.³⁵

Table 5.2. Rwanda: Domestic Public Debt

	2014		2015		2016		
	Billions		Billions		Billions		
	RWF	Share	RWF	Share	RWF	Share	% GDP
Medium and Long-term borrowing	178	46	182	36	261	46	3.9
off which T-bonds	64		115		168		
Short-term borrowing	212	54	323	64	310	54	4.7
Total	390	100	505	100	571	100	8.6

Source: Rwandan authorities and IMF staff.

Table 5.3. Selected Macroeconomic Indicators, Current versus Previous DSA

		2016	2017	2018	2019	2020
Real GDP growth (percent)	Current DSA	5.9	6.2	6.8	7.3	7.5
	Previous DSA	6.0	6.0	7.0	7.2	7.5
Inflation (average)	Current DSA	4.9	7.4	5.5	4.6	5.0
	Previous DSA	4.4	4.6	4.8	5.0	5.0
Primary balance (% of GDP)	Current DSA	-2.8	-2.8	-2.7	-2.7	-1.8
	Previous DSA	-3.7	-2.3	-1.9	-3.3	-2.5
Current account (% of GDP)	Current DSA	-14.4	-10.2	-11.2	-9.9	-8.7
	Previous DSA	-16.5	-12.0	-10.2	-11.1	-11.1
FDI (% of GDP)	Current DSA	2.9	3.3	4.2	4.4	4.4
	Previous DSA	3.9	4.0	4.2	4.5	4.8

Source: Rwandan authorities, IMF, and World Bank staff.

³⁵ For instance, the authorities have launched a ‘Made in Rwanda’ policy, to address barriers to international competitiveness with the aim of supporting domestic production (and lower imports) in key sectors, including construction materials, light manufacturing, and agro-processing with the aim to achieve forex savings of roughly US\$450 million per year.

Box 5.1. Macroeconomic Framework for the DSA

The medium-term and long-term framework underpinning the DSA assumes that Rwanda continues to enjoy rapid growth, with low and stable inflation.

Key highlights:

Growth. Projected long-run growth stands at 7.5 percent, unchanged from previous analysis and close to historical growth rates and thus, conservatively does not reflect a growth dividend from significant public investment in recent years. The composition of growth is anticipated to shift toward the private sector and net exports as measures designed to expand and diversify the export base and promote import substitution are assumed to be fruitful.

External sector. Exports of goods and services (as a percent of GDP) are expected to grow consistent with historical rates reflecting, in part, strategic public investments and export promotion. Import needs are expected to remain high, although import growth rates are anticipated to be slightly below historical averages, as domestic production of certain items—such as concrete—supports import substitution. Consequently, while Rwanda’s current account is projected to remain in deficit, it is expected to narrow over the period under consideration.

Inflation. Inflation is expected to remain contained. Although inflation had risen to 7.3 percent by the end of 2016, it is expected to decline to and be maintained at the authorities’ medium-term target of 5 percent.

Reserves. Reserve buffers are expected to gradually increase toward 4.5 months of prospective imports, consistent with the monetary integration process among East African Community members.

Fiscal outlook. There is assumed to be a gradual and consistent rise in domestic revenues reflecting the authorities’ commitment to raise Rwanda’s revenue collection efforts to a comparable level observed in other countries in the region. Primary expenditures are forecast to remain high, however, reflecting the ongoing need for significant capital and current spending.

Grants. The DSA assumes a tapering of external assistance from development partners in real terms over the projection period, reflecting reduced access to grants and greater capacity to mobilize and use domestic revenue.

External borrowing. The assumptions for new external borrowing vary over the assessment period. With the development of local bond markets and improvement in the current account position, external borrowing is expected to decline from close to 5 percent of GDP, on average, over the last two years to under 2 percent of GDP. Compositionally, from 2016 to 2021, the framework assumes that the central government external borrowing needs are met mainly by disbursements of already contracted external multilateral and bilateral debt.^a From 2022 onward, the framework assumes that such needs will be financed with a progressively increasing share of commercial debt, including bonds issued in the international capital markets.

Domestic borrowing. The framework assumes that, over the long term, net domestic borrowing will increase gradually from 1.4 percent of GDP, on average, in the last two years to 2.6 percent by 2037, reflecting efforts to both deepen and strengthen the domestic debt markets. Over time, the composition of that borrowing is expected to shift toward medium- and long-term debt as the authorities intensify efforts to develop local government bond markets.

Domestic interest rates. New domestic borrowing is expected to be contracted at a nominal interest rate of 8 percent—slightly below current short-term T-bill rates.

Note: a. Over this period, committed-but-undisbursed debt is equivalent to around 90 percent of estimated external financing needs.

DEBT SUSTAINABILITY ANALYSIS

A. External DSA

6. **Based on the assumptions outlined earlier**, Rwanda's debt is assessed to be sustainable with low risk of debt distress (Figure 5.3 and tables 5.4 and 5.5). Like the last DSA update, Rwanda is classified as a 'strong' performer, based on the quality of the country's policies and institutions as measured by the three-year average of the ratings under the World Bank's Country Policy and Institutional Assessment (CPIA). This is reflected in higher (more accommodative) debt sustainability thresholds compared to countries operating in a weak policy environment.

7. **Under the baseline scenario, all but one debt burden indicators are projected to remain below the policy-dependent thresholds.** The only breach occurs in 2023 when the present value of debt service-to-revenue ratio just exceeds its threshold, although that breach is temporary in nature (lasting one year) and relates to when the 2013 eurobond is set to mature. The present value of debt service-to-exports ratio also peaks in 2023, although with a small breach of the indicative threshold under the largest stress scenario—a shock to export growth. Other indicators remain well below their thresholds even under the most extreme stress scenarios. Using the probability approach, based on country-specific CPIA and historical growth information to focus on the evolution of the probability of debt distress over time, all baseline indicators remain well below their thresholds.

8. **Aside from some potential liquidity pressures when the 2013 eurobond is set to mature, the risks to the forecast are low.** While medium-term GDP assumptions are high compared to other countries, they are lower than Rwanda's historical averages: in any case, the low risk rating is robust even with somewhat lower assumptions. As the debt-service breach from the eurobond is temporary, and considering the relatively low level of external debt, strengthening indicators of repayment capacity (the expansion of the export base and tax revenues), and that Rwanda is assumed to refinance the maturing eurobond, also given the relatively strong capacity to develop a medium-term debt management strategy, the final assessment for Rwanda's external public and public guaranteed debt remains low risk of debt distress. However, risks have increased in recent years in line with large public investment projects. A projected continued gradual tapering of budget support and shift away from grants requires a focus on domestic revenue collection.

B. Public DSA

9. **The results of the analysis are not altered by adding domestic public debt to external debt (see Figure 5.3).** The evolution of total public debt indicators broadly follows that of external debt under the baseline—peaking in 2019 before receding as the primary deficit begins to decline. In present value terms, debt remains significantly below the low-income country (LIC) DSA public debt benchmark of 74 percent for those countries with strong policies and institutions.

10. **The alternative scenarios and bounds tests indicate that the projected path for public debt indicators remain within the relevant benchmarks.** Under a standard scenario that keeps the primary balance unchanged from its 2016 level, the present value of debt-to-revenue drifts upward, highlighting the importance of securing revenue gains assumed under the baseline.

Authorities' Views

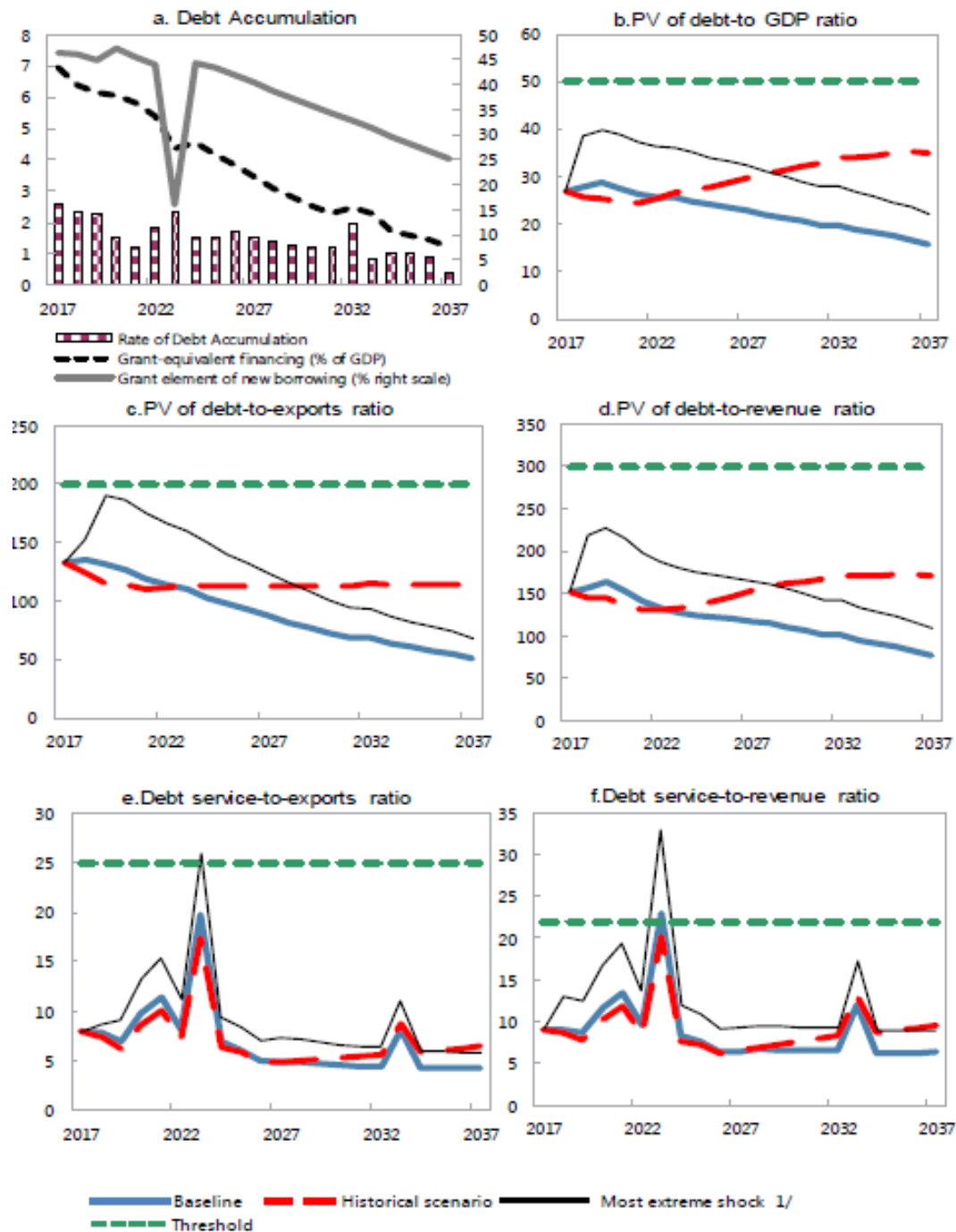
11. **The Rwandan authorities broadly agree with the results of this DSA and the overall conclusion of a low risk of external debt distress.** The authorities pay very close attention to debt sustainability and regularly carry out their own analysis. They reiterated the commitment that their debt management strategy will be to maximize external concessional funding to avoid unsustainable debt levels, while developing the domestic capital market. The mix of domestic financing will be reoriented toward issuance of more treasury bonds versus bills, therefore increasing the maturity length of the portfolio. They highlighted that recent and ongoing investments and the implementation of measures to expand and diversify the traditional and nontraditional exports and tourism sectors should help improve resilience. The authorities also noted potential liquidity pressures when the 2013 eurobond is set to mature and agreed that having a prudent medium-term debt management strategy in place and carefully prioritizing future projects and their financing are necessary to contain public debt vulnerabilities.

Conclusion

12. **Rwanda continues to face a low risk of debt distress.** External debt burden indicators remain below 'risk' thresholds, except for a small and temporary baseline breach, in the debt service-to-revenue ratio and stress test breach of the debt service-to-exports ratio. Those breaches underscore Rwanda's susceptibility to external shocks and the potential risk of liquidity pressures in the future. However, it is judged that the risk arising from these breaches can be mitigated by the ability of the authorities to refinance non-concessional debt falling due in 2023, if sound macroeconomic and fiscal policies are maintained. Public debt, though increasing, remains comparatively low and the profile of Rwanda's external debt burden is also expected to improve over time, given expected strong growth, expansion in exports, and improvement in revenues.

13. **The main risk to Rwanda's debt sustainability remains the narrow export base.** While it is assumed that this risk will be mitigated by export expansion and diversification over the assessment period, recent weakness in exports, such as minerals, highlights the vulnerability that arises from a narrow export base heavily affected by fluctuating commodity prices and output. Moreover, should the anticipated medium-to longer-term expansion in exports fail to materialize, resulting in lower than expected export receipts, the risks to debt sustainability over the longer term would rise. And, more generally, while the high growth rates are expected to be sustained, policy vigilance is warranted should growth disappoint.

Figure 5.3. Rwanda: Indicators of Publicly Guaranteed External Debt Under Alternative Scenarios, 2017–2037^a



Sources: Country authorities and staff estimates and projections.

Note: a. The most extreme stress test is the test that yields the highest ratio on or before 2027. In Figure b, it corresponds to a one-time depreciation shock, in c, to an exports shock, in d to a one-time depreciation shock, in e, to an exports shock, and in Figure f to a one-time depreciation shock.

PV = Present value.

Table 5.4. Rwanda: External Debt Sustainability Framework, Baseline Scenario, 2014–2037 ^{1/} (In percentage GDP, unless otherwise indicated)

	Actual			Historical ^{4/} Standard ^{4/}		Projections										
	2014	2015	2016	Average	Deviation	2017	2018	2019	2020	2021	2022	2017-2022 Average		2027	2037	2033-2037 Average
External debt (nominal) ^{1/}	27.1	31.1	39.0			41.3	43.3	45.2	44.6	43.7	43.3			39.2	29.4	
of which: public and publicly guaranteed (PPG)	23.2	27.9	35.8			38.1	40.2	42.1	41.3	40.4	39.9			34.9	22.6	
Change in external debt	1.1	4.0	7.9			2.2	2.0	2.0	-0.6	-0.9	-0.4			-1.0	-1.5	
Identified net debt-creating flows	6.6	9.8	11.0			4.7	4.4	2.5	1.2	0.8	0.6			-0.2	-0.4	
Non-interest current account deficit	11.1	12.7	13.7	8.2	3.8	9.2	10.3	9.0	7.8	7.5	7.2			6.2	5.6	6.1
Deficit in balance of goods and services	16.8	17.2	18.0			12.8	13.7	12.3	11.5	10.9	10.4			8.7	6.9	
Exports	16.4	18.4	19.0			20.3	20.6	21.9	21.7	22.2	22.7			26.4	30.8	
Imports	33.2	35.6	37.0			33.1	34.3	34.2	33.3	33.2	33.2			35.1	37.7	
Net current transfers (negative = inflow)	-7.2	-6.5	-6.2	-10.0	2.6	-5.6	-5.4	-5.4	-5.2	-4.9	-4.6			-3.5	-2.0	-3.1
of which: official	-9.5	-8.4	-6.6			-6.0	-5.8	-5.7	-5.4	-5.0	-4.5			-2.9	-1.0	
Other current account flows (negative = net inflow)	1.5	2.0	2.0			2.0	2.0	2.1	1.5	1.4	1.4			1.0	0.8	
Net FDI (negative = inflow)	-3.9	-2.7	-2.9	-2.5	0.9	-3.3	-4.2	-4.4	-4.4	-4.4	-4.4			-4.4	-4.6	-4.5
Endogenous debt dynamics ^{2/}	-0.6	-0.2	0.2			-1.3	-1.7	-2.0	-2.2	-2.2	-2.2			-2.0	-1.4	
Contribution from nominal interest rate	0.7	0.7	0.7			1.0	1.0	1.0	0.9	0.8	0.8			0.7	0.7	
Contribution from real GDP growth	-1.9	-2.3	-1.8			-2.3	-2.7	-3.0	-3.2	-3.0	-3.0			-2.7	-2.1	
Contribution from price and exchange rate changes	0.6	1.5	1.3			—	—	—	—	—	—			—	—	
Residual (3-4) ^{3/}	-5.5	-5.9	-3.1			-2.4	-2.4	-0.6	-1.8	-1.7	-0.9			-0.8	-1.2	-0.7
of which: exceptional financing	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0			0.0	0.0	
PV of external debt ^{4/}	...	...	29.2			29.9	30.8	31.8	30.8	29.7	29.2			27.1	22.5	
In percent of exports	...	...	153.8			147.6	149.6	145.1	141.8	133.5	128.5			102.7	73.2	
PV of PPG external debt	...	...	26.0			26.8	27.7	28.6	27.6	26.3	25.7			22.8	15.7	
In percent of exports	...	...	136.9			132.2	134.7	130.7	126.9	118.5	113.2			86.6	51.0	
In percent of government revenues	...	...	140.3			152.1	157.1	164.3	152.8	140.6	132.7			117.2	77.0	
Debt service-to-exports ratio (in percent)	7.8	6.8	7.0			10.3	10.2	9.4	11.8	13.3	9.9			6.0	5.2	
PPG debt service-to-exports ratio (in percent)	4.5	4.0	4.5			7.9	7.7	6.9	9.7	11.4	8.1			4.8	4.2	
PPG debt service-to-revenue ratio (in percent)	4.5	4.0	4.6			9.1	9.0	8.7	11.7	13.5	9.5			6.5	6.3	
Total gross financing need (Billions of U.S. dollars)	0.7	1.0	1.1			0.8	0.8	0.7	0.7	0.8	0.7			0.8	1.8	
Non-interest current account deficit that stabilizes debt ratio	10.0	8.8	5.8			7.0	8.3	7.0	8.5	8.4	7.6			7.2	7.2	
Key macroeconomic assumptions																
Real GDP growth (in percent)	7.6	8.9	5.9	7.6	1.8	6.2	6.8	7.3	7.5	7.5	7.5	7.1	7.5	7.5	7.5	7.5
GDP deflator in US dollar terms (change in percent)	-2.4	-5.1	-4.1	2.7	6.6	-0.1	-1.2	-2.2	0.1	2.0	2.0	0.1	2.0	2.0	2.0	2.0
Effective interest rate (percent) ^{5/}	2.7	2.5	2.2	1.6	0.9	2.7	2.5	2.4	2.2	2.1	2.0	2.3	2.0	2.4	2.2	2.2
Growth of exports of G&S (US dollar terms, in percent)	12.4	15.7	4.9	18.1	21.6	13.3	7.1	11.7	6.7	12.0	12.2	10.5	12.9	9.6	11.8	11.8
Growth of imports of G&S (US dollar terms, in percent)	8.9	10.9	5.3	15.6	14.8	-5.0	9.3	4.6	4.7	9.2	9.6	5.4	11.0	9.6	10.5	10.5
Grant element of new public sector borrowing (in percent)	...	...	...	...	...	46.6	46.1	45.0	47.4	45.5	44.0	45.8	40.5	25.2	33.8	33.8
Government revenues (excluding grants, in percent of GDP)	16.5	18.4	18.5			17.6	17.6	17.4	18.0	18.7	19.4			19.5	20.4	19.9
Aid flows (in Billions of US dollars) ^{7/}	0.9	0.9	0.8			0.7	0.7	0.7	0.7	0.7	0.7			0.8	0.6	
of which: Grants	0.6	0.5	0.4			0.4	0.4	0.4	0.4	0.4	0.5			0.5	0.5	
of which: Concessional loans	0.3	0.4	0.3			0.3	0.2	0.2	0.3	0.3	0.3			0.3	0.1	
Grant-equivalent financing (in percent of GDP) ^{8/}	...	...	...			7.0	6.4	6.2	6.1	5.8	5.4			3.5	1.2	2.8
Grant-equivalent financing (in percent of external financing) ^{8/}	...	...	...			71.0	72.5	72.7	73.1	70.7	69.7			68.4	58.8	60.4
Memorandum items:																
Nominal GDP (Billions of US dollars)	8.0	8.3	8.4			8.9	9.4	9.9	10.6	11.6	12.8			20.2	50.4	
Nominal dollar GDP growth	5.1	3.3	1.6			6.1	5.6	4.8	7.6	9.6	9.6	7.2		9.6	9.6	9.6
PV of PPG external debt (in Billions of US dollars)	...	...	2.1			2.3	2.5	2.7	2.9	3.0	3.2			4.5	7.8	
(Pvt-Pvt-1)/GDPt-1 (in percent)	...	...	0.2			2.6	2.9	2.3	1.5	1.2	1.9	2.0		1.5	0.4	1.3
Gross workers' remittances (Billions of US dollars)	0.2	0.2	0.2			0.2	0.2	0.2	0.2	0.2	0.2			0.5	1.5	
PV of PPG external debt (in percent of GDP + remittances)	...	...	25.5			26.3	27.2	28.1	27.1	25.8	25.2			22.3	15.3	
PV of PPG external debt (in percent of exports + remittances)	...	...	123.9			120.9	123.3	120.3	116.6	109.0	104.4			79.7	46.6	
Debt service of PPG external debt (in percent of exports + remittances)	...	...	4.1			7.2	7.1	6.3	8.9	10.5	7.5			4.4	3.8	

Source: Country authorities and staff estimates and projections

Note: 1/ Includes both public and private sector external debt.

2/ Derived as $[r - g - p] / (1 + g + p)$ times previous period debt ratio, with r = nominal interest rate; g = real GDP growth rate; and p = growth rate of GDP deflator in U.S. dollar terms.

3/ Includes exceptional financing (that is, changes in arrears and debt relief). Changes in gross foreign assets, and valuation adjustments. For projections also includes contribution from price and exchange rate changes.

4/ Assumes that the present value of private sector debt is equivalent to its face value.

5/ Current year interest payments decided by previous period debt stock

6/ Historical averages and standard deviations are generally derived over the past 10 years, subject to data availability.

7/ Defined as grants, concessional loans, and debt relief.

8/ Grant-equivalent financing includes grants provided directly to the Government and through new borrowing (difference between the face value and the present value of the new debt).

ANNEX 6: LINK OF THE FIRST PROGRAMMATIC ENERGY SECTOR DEVELOPMENT POLICY OPERATION TO RWANDA'S NATIONALLY DETERMINED CONTRIBUTION UNDER THE PARIS AGREEMENT

- 1. Rwanda's NDC defines Rwanda's contribution to climate change mitigation as "emission reductions compared to a business-as-usual scenario, based on policies and actions conditional on availability of international support for finance, technology and capacity building."** The mitigation vision of the NDC is to "put Rwanda on the road to a low carbon economy", and to achieve "energy security and a low carbon energy supply that support the development of green industry and services and avoids deforestation".
- 2. The program supports all three NDC priority mitigation actions in the power sector and promotes a renewable energy transition in both grid and off-grid space.** Rwanda's NDC prioritizes (a) increase in the share of new grid-connected renewable capacity compared to fossil fuels (supported by the LCPDP under Prior Actions 1.2, 1.3, and 1.4); (b) the installing of solar PV in rural communities (supported by Prior Actions 1.5, 1.8, and Trigger 2.11); and (c) increases in energy efficiency through demand-side measures and grid-loss reduction (supported by Prior Actions 1.1, 1.6, and 1.10). The fourth NDC Priority Mitigation Action in energy relates to biofuels and is, therefore, outside of the scope of this DPO series.
- 3. The program will support a deliberate evolution towards a lower carbon energy mix with larger role for hydro, solar, and lake methane (NDC Priority Mitigation Action 1.1).** Improved generation investment planning and effective implementation of LCPDP, as supported under the program's Pillar B.1, are expected to yield significant climate mitigation and adaptation co-benefits. Hydropower, solar power, and lake methane represent Rwanda's lowest-cost and lowest-emission options for expanding electricity supply in the medium to long term. Therefore, Rwanda's NDC aims to increase the share of these three fuels in its electricity generation mix (Priority Mitigation Action 1.1 in Rwanda's NDC). However, the effective utilization of hydropower and solar power requires adequate planning of the supply-demand balance and the grid. This is to be achieved through the preparation, regular update, and effective implementation of the LCPDP (Prior Actions 1.2, 1.3, and associated triggers).
- 4. The LCPDP and its implementation represent a significant deviation from current practice, which mostly relied on direct proposals from project developers to identify new generation investment options.** Rwanda's approach to power sector expansion planning before this program was ad hoc. No Least-Cost Power Sector Development Plan had been approved by the Government and effectively implemented. A draft LCPDP was prepared in FY2014/15 with donor funds and presented to the Energy Sector Working Group on February 9, 2015. But the plan was never adopted by the Government. In the absence of an LCPDP, most new capacity has been procured based on unsolicited proposals without competitive processes and without adequate consideration of the relative costs and benefits of different options resulting from properly conducted least-cost planning. This imposes undue financial burden on the sector, putting at risk achievement of the Government's affordability and expansion targets. Aiming to improve sector expansion planning and align planning and operational functions, the LCPDP was financed and implemented by REG under leadership of MININFRA, with technical support from a partner utility in an OECD country.
- 5. The LCPDP's business-as-usual (baseline) scenario includes the construction of four major thermal power plants that would add 205 MW between 2019 and 2024, roughly doubling current generation capacity.** These plants, which are at various stages of development, include a peat power plant (80 MW) in Gisagara and another 125 MW of lake methane power plants, consisting of the next phase (75

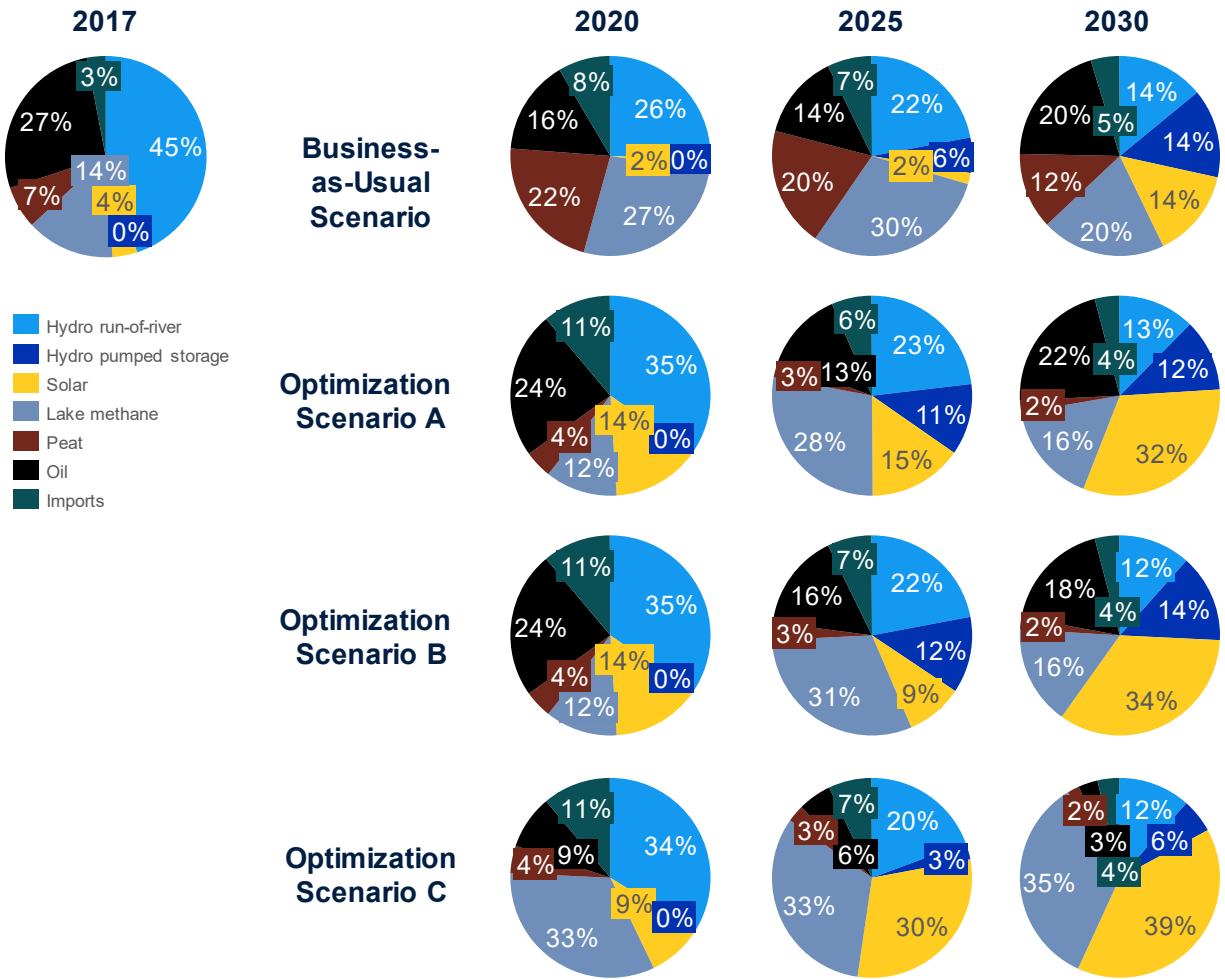
MW) of the KivuWatt plant and an additional 50 MW plant developed by Symbion in two phases (13 MW and 37 MW).

6. **The LCPDP considers a number of alternative scenarios that explore options for optimizing generation capacity expansion compared to business-as-usual.** The main mechanism of cost reduction compared to the baseline scenario is higher investments in solar and gas, reducing the need for oil and peat in the energy mix. This annex presents the results for three of the five alternative scenarios which are discussed in detail in the LCPDP (referred to here as ‘Optimization Scenarios A–C’)³⁶. Under the Optimization Scenario A, system costs are optimized under the assumption that the thermal power plants under development are commissioned only if and when cost-effective. Optimization Scenario B is the same as A but under the assumption of a 30 percent higher diesel price. Optimization Scenario C is the same as A but includes the option to develop additional gas engines. The other two scenarios not presented here are sensitivity analyses on the presented scenarios (one considers the impact of non-availability of gas, the other considers the integration of the thermal power plants in stages, rather than at once). Both cost more than the presented Scenarios A–C.

7. **The LCPDP shows that improved sector planning, especially the better utilization of the country’s solar and gas resources, can significantly reduce generation cost and greenhouse gas emissions compared to the business-as-usual.** As shown in Figure 6.1, the share of solar in the capacity mix increases from 14 percent to 39 percent when system costs are optimized (Scenario C), while the share of gas increases from 20 percent to 35 percent. The lowest-cost LCPDP scenario (Scenario C) increases the total share of renewables in Rwanda’s generation capacity mix, including hydro, to 59 percent by 2030, compared to 45 percent under business-as-usual scenario (i.e., an increase by one third compared to the business-as-usual) and reduces emissions by 560,000 tCO_{2eq} per year by 2030 compared to the business-as-usual scenario (a 44 percent reduction, as shown in Figure 6.2). Adoption, regular update, and effective implementation of the LCPDP will, therefore, reduce GHG emissions from the power sector compared to the business-as-usual scenario while generating huge savings for Rwanda (US\$527 million and US\$641 million of cumulative savings by 2030 in the case of Scenarios A and C, respectively).

³⁶ The scenario names were chosen for identification purposes and are not used in the LCPDP.

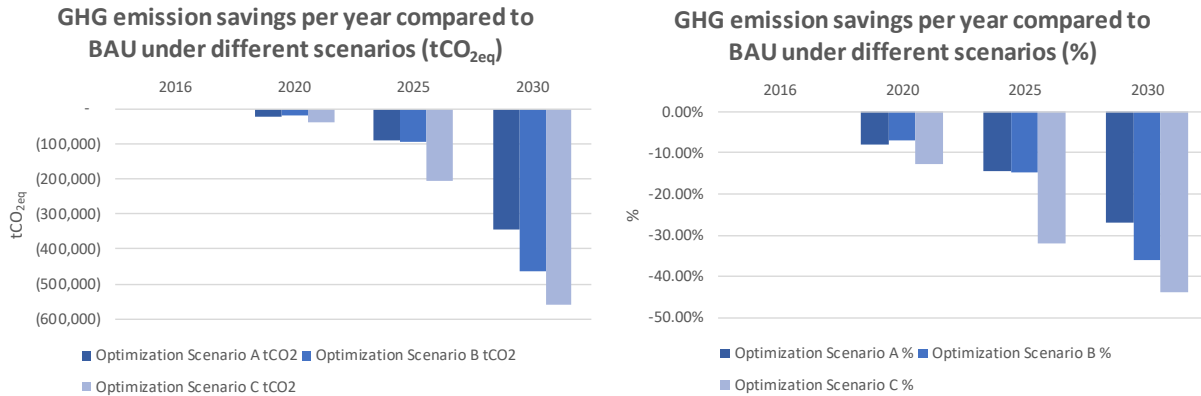
Figure 6.1. Generation Capacity Mix Under Different LCPDP Scenarios



Source: REG.

Note: The presented capacity mix excludes import capacity (LCPDP includes 30 MW from Kenya).

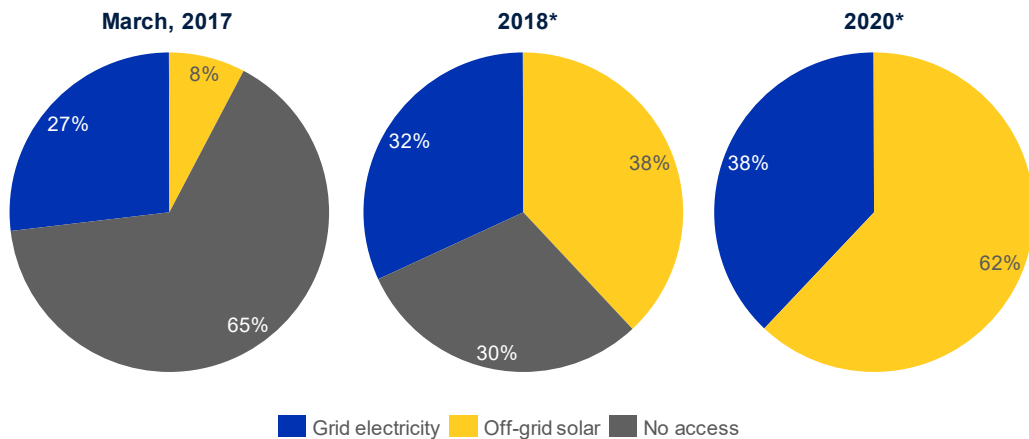
Figure 6.2. GHG Emission Reductions Relative to Business-as-Usual Under Different Scenarios in the LCPDP



Source: World Bank staff estimates based on information from LCPDP/REG.
 Note: BAU = Business as Usual.

8. **The program will also support the Government’s push for off-grid solar to play a larger role in access expansion moving households to transition from kerosene and dry cell battery use for lighting purposes.** In view of the high cost of new connections to the grid, households’ limited ability to afford electricity, and recent rapid progress in off-grid solutions (especially solar), the Government has reconsidered its strategy for access expansion. It is now placing more emphasis on off-grid solar as a means to provide access to households that have relatively basic electricity needs and would have difficulties affording even a subsidized connection fee for a grid connection. In May 2016, the Government approved a RES under which grid access is expected to be limited to 32 percent (763,000 households) by 2018 and 38 percent (890,000 households) by 2020. The remainder is to be achieved through off-grid solutions (see Figure 6.3). Prior Actions 1.5 and 1.8 and Trigger 2.11 are key steps toward implementation of these new targets. By relying on solar rather than on grid-based electricity (which had an average emission factor of 240 gCO_{2eq}/kWh in 2016), this policy will reduce emissions from access expansion significantly. The program is thus closely aligned with Rwanda’s NDC, specifically NDC Priority Mitigation Action 2.1 (installing of solar PV in rural communities).

Figure 6.3. Consumers Served through Different Forms of Access in 2017 and Government Targets for 2018 and 2020



Source: MINECOFIN. *Targets are currently under revision.

9. **Implementation of the program will provide electricity users effective signals to promote efficiency in their consumption (Priority Mitigation Action 3.1 in Rwanda’s NDC).** Prior Action 1.1 and associated triggers under Pillar A will allow to determine the utility’s ERR, which forms the basis for cost-reflective pricing and associated climate change mitigation co-benefits. Under Prior Action 1.6, time-of-use incentives and demand charges for large consumers provide industrial electricity users effective signals to promote efficiency in their consumption and shift consumption away from demand spikes. Because all peaking power plants in Rwanda are oil fired, this smoothening of the demand profile will have climate change mitigation co-benefits.

10. **Pillar B.4 will promote system-loss reduction (Priority Mitigation Action 3.1 in Rwanda’s NDC).** By promoting operational efficiency and system management, the prior actions and associated triggers under Pillar B.4 are expected to lower system losses, which would reduce the need for fossil-fueled generation to meet demand, thereby reducing carbon emissions.

11. **Climate adaptation co-benefits.** Adequate sector planning and effective implementation of the LCPDP will also allow the Government to better plan for hydrology risks and mitigate their impact on the security of supply by developing alternative energy sources (especially solar), thus strengthening the adaptation framework for the sector.