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INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT PAPER

ON A

PROPOSED ADDITIONAL GUARANTEE

IN THE AMOUNT OF UP TO US\$2.8 MILLION EQUIVALENT

TO THE REPUBLIC OF ZAMBIA

AND ON A

PROPOSED INTERNATIONAL FINANCE CORPORATION (IFC) FINANCING CONSISTING OF
AN A LOAN IN THE AMOUNT OF UP TO US\$12 MILLION, A SENIOR LOAN IN THE AMOUNT OF UP
TO US\$12 MILLION FROM IFC ACTING AS IMPLEMENTING ENTITY OF THE IFC-CANADA CLIMATE
CHANGE PROGRAM (IFC-CCCP), AND U.S. DOLLAR INTEREST RATE SWAPS REPRESENTING A
LOAN EQUIVALENT EXPOSURE OF UP TO US\$2.5 MILLION

TO NGONYE POWER COMPANY LIMITED

IN SUPPORT OF THE

ZAMBIA SCALING SOLAR ENERGY PROJECT

November 29, 2017

World Bank - Energy and Extractives Global Practice - Africa Region
International Finance Corporation - Infrastructure Department

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CURRENCY EQUIVALENTS
(Exchange Rate Effective as of October 31, 2017)

Currency Unit = Zambian Kwacha (ZMW)

ZMW 10.05 = US\$1

US\$1 SDR 0.71

FISCAL YEAR
January 1 - December 31

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
AfDB	African Development Bank
AIMM	Anticipated Impact Measurement and Monitoring
CoSS	Cost of Service Study
CPF	Country Partnership Framework
DFI	Development Finance Institution
DOTS	Development Outcome Tracking System
E&S	Environmental and Social
EIB	European Investment Bank
EGP	Enel Green Power
EPC	Engineering, Procurement, and Construction
ERB	Energy Regulation Board
EROIC	Economic Return on Invested Capital
ERR	Economic Internal Rate of Return
ESAP	Environmental and Social Action Plan
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESRS	Environmental and Social Review Summary
FY	Financial Year
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GHI	Global Horizontal Irradiation
GRS	Grievance Redress Service
GRZ	Government of the Republic of Zambia
GSA	Government Support Agreement
HFO	Heavy Fuel Oil
GWh	Gigawatt Hour
IDA	International Development Association
IDC	Industrial Development Company
IFC	International Finance Corporation

IFC-CCCP	International Finance Corporation-Canada Climate Change Program
IPF	Investment Project Financing
IPP	Independent Power Producer
ISP	Implementation Support Plan
ISR	Implementation Status and Results
kV	Kilovolt
kWh	Kilowatt Hour
LC	Letter of Credit
NPV	Net Present Value
M&E	Monitoring and Evaluation
MIGA	Multilateral Investment Guarantee Agency
MFD	Maximizing Financing for Development
MFEZ	Multifacility Economic Zone
MoE	Ministry of Energy
MoF	Ministry of Finance
MW	Megawatt
MWp	Megawatt Peak
NPV	Net Present Value
O&M	Operation and Maintenance
PDO	Project Development Objective
PPA	Power Purchase Agreement
PS	Performance Standard
PV	Photovoltaic
RFP	Request for Proposals
ROIC	Return on Invested Capital
SORT	Systematic Operations Risk-rating Tool
SPV	Special Purpose Vehicle
TTL	Task Team Leader
VRE	Variable Renewable Energy
WACC	Weighted Average Cost of Capital
WTP	Willingness-to-pay
WBG	World Bank Group
ZEMA	Zambia Environmental Management Agency
ZESCO	Zambia Electricity Supply Corporation Limited

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BASIC INFORMATION – PARENT (Zambia Scaling Solar Energy Project - P157943)

Country Zambia	Product Line GU	Team Leader(s) Mirlan Aldayarov, Arnaud Braud (IDA) Yasser Charafi, Soumya Banerjee (IFC)		
Project ID P157943	Financing Instrument Investment Project Financing (Guarantee)	Resp CC GEE08	Req CC AFCS1	Practice Area (Lead) Energy and Extractives

Implementing Agency:

Bangweulu Power Company Limited

Is this a regionally tagged project? No			
<input type="checkbox"/> Situations of Urgent Need or Capacity Constraints <input type="checkbox"/> Financial Intermediaries <input type="checkbox"/> Series of Projects	Bank/IFC Collaboration Yes	Guarantee Expiration Date April 15, 2035	
Approval Date February 16, 2017	Closing Date October 15, 2018	Original Environmental Assessment Category B- Partial Assessment	Current EA Category B- Partial Assessment

Development Objective(s)

The project development objective is to increase solar electricity generation capacity and diversify electricity generation sources in Zambia.

Rating (from Parent ISR)



	Implementation
	July 26, 2017 First Implementation Status Report (ISR)
Progress towards achievement of PDO	Satisfactory
Overall Implementation Progress (IP)	Satisfactory
Overall Safeguards Rating	N/A
Overall Risk	N/A

BASIC INFORMATION – ADDITIONAL FINANCING (P163958)

Project ID P163958	Project Name Additional Financing for Zambia Scaling Solar Energy Project	Additional Financing Type Scale Up	Urgent Need or Capacity Constraints No
Lending instrument Investment Project Financing	Product line GU	Expected Approval Date December 19, 2017	Environment Assessment Category B- Partial Assessment
Closing Date 31-Dec-2019	Bank/IFC Collaboration Yes	Expected Guarantee Expiration Date 31-Jan-2036	
Is this a regionally tagged project? No			

- Situations of Urgent Need or Capacity Constraints
- Financial Intermediaries
- Series of Projects

PROJECT FINANCING DATA – PARENT (Zambia Scaling Solar Energy Project - P157943)

**Disbursement Summary (from Parent ISR)**Expected Guarantee Signing Date
November 31, 2017Expected Guarantee Effectiveness Date
January 31, 2018**PROJECT FINANCING DATA – ADDITIONAL FINANCING (P163958)****FINANCING DATA**

<input type="checkbox"/> Counterpart Funding	<input type="checkbox"/> IBRD Loan	<input type="checkbox"/> IDA Credit	<input type="checkbox"/> Trust Funds	<input type="checkbox"/> Parallel Financing
		<input type="checkbox"/> Crisis Response Window	<input checked="" type="checkbox"/> Guarantees	<input checked="" type="checkbox"/> IFC Loan
		<input type="checkbox"/> Regional Projects Window		

For Loans/Credits/Others (US\$, millions)

		Financing Source	Amount
Total Project Cost:	48.00	Estimated Equity	12.00
Financing Gap:	0.00	Estimated Debt from Development Finance Institutions	36.00
Total Bank Financing:	0.00	IDA Payment guarantee	2.80
Of Which Bank Financing (IBRD/IDA):	0.00	Total	48.00

FINANCING SUMMARY (Parent and AF)

	Parent Project	Additional Financing	Total
Total Project Cost	60.00	48.00	108.00
Total Financing	60.00	48.00	108.00
Estimated Equity	15.00	12.00	27.00
Estimated Debt from Development Finance Institutions	45.00	36.00	81.00
IDA Payment guarantee	3.50	2.80	6.30

Systematic Operations Risk-Rating Tool (SORT)



Risk Category	Rating
1. Political and Governance	Substantial
2. Macroeconomic	Moderate
3. Sector Strategies and Policies	High
4. Technical Design of Project or Program	Moderate
5. Institutional Capacity for Implementation and Sustainability	Substantial
6. Fiduciary	Moderate
7. Environment and Social	Moderate
8. Stakeholders	Moderate
OVERALL	Substantial

Policy

Does the project depart from the CAS/CPF in content or in other significant respects?

Yes No

Does the project require any other Policy waiver(s)?

Yes No

INSTITUTIONAL DATA

Practice Area (Lead)

Energy and Extractive Global Practice

Contributing Practice Areas

N/A

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

No



b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment
No

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

N/A

PROJECT TEAM

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**ZAMBIA:
ADDITIONAL FINANCING FOR ZAMBIA SCALING SOLAR ENERGY PROJECT
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I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

A. Introduction

1. This Project Paper seeks the Executive Directors' approval for an additional guarantee from the International Development Association (IDA) and a financing from the International Finance Corporation (IFC) for the Zambia Scaling Solar Energy Project in the Republic of Zambia. The project is part of the Scaling Solar Program, a World Bank Group (WBG) initiative to bring commercial financing and expertise in competitive and transparent solar power tenders, in line with the Maximizing Financing for Development (MFD) approach. The proposed additional financing (AF) (guarantee) will further scale up the development impact of the original project.

2. In a letter dated September 23, 2015, the Government of the Republic of Zambia (GRZ) requested IDA guarantees for two solar photovoltaic (PV) projects under Round 1 of the Scaling Solar tenders. IDA management approved a Project Concept Note for the two projects under Round 1 on December 15, 2015. The guarantee for the first solar project for up to US\$3.5 million was approved by the joint World Bank/IFC Board of Executive Directors on February 16, 2017 (the West Lunga-Bangweulu Project, P157943) and its financing agreements were signed in October 2017. The second solar project (the Ngonye Project) was discussed in the project appraisal document for West Lunga-Bangweulu, but was not presented for Board approval at the same time because its Environmental and Social (E&S) documents had not been finalized nor disclosed and therefore its appraisal had not been completed at that time. The Ngonye Project has now been appraised and the E&S documents disclosed. The project development objective (PDO) remains unchanged: to increase solar electricity generation capacity and diversify electricity generation sources in Zambia. The proposed additional guarantee will support the addition of 34 Megawatt peak (MWp), equivalent to 28.2 Megawatt (MW AC). The Additional Financing (AF) will provide an IDA guarantee in the amount of up to US\$2.8 million (an IDA country allocation to Zambia of up to US\$0.7 million) and IFC financing consisting of an A Loan in the amount of up to US\$12 million, a senior loan in the amount of up to US\$12 million from IFC acting as implementing entity of the IFC-Canada Climate Change Program (IFC-CCCP), and U.S. Dollar interest rate swaps representing a loan equivalent exposure of up to US\$2.5 million. The AF will also involve a restructuring, including (a) re-naming of the original project from West Lunga Scaling Solar Energy Project to Zambia Scaling Solar Energy Project aiming to accommodate additional financing project activities, (b) extending the closing date from October 15, 2018 to December 31, 2019, and (c) updating the results framework to reflect the scale up.

3. The Regional Operational Committee meeting for the original project held on December 16, 2016, decided that this additional IDA guarantee and IFC financing would be processed as an AF under World Bank Investment Project Financing Directive and Policy.

B. Background

(i) Country Context

4. Zambia is a resource-rich country with substantial mineral endowments (especially copper) and with significant agricultural potential. Though the country covers an area of approximately 750,000 km², it is relatively sparsely populated with a rapidly growing population (close to 16 million people). Zambia



recorded an impressive economic growth in 2004–14, which averaged 7.4 percent, but in 2015–16 the Zambian economy slowed down significantly.

5. The slowdown was due to tough external conditions, including low global demand for commodities, including copper, which resulted in lower prices for the metal and tight global financial conditions. Domestically, electricity supply shortages and reduced agricultural production due to lower than expected rainfall due to El Niño effects also contributed to the economic slowdown. Furthermore, in light of a very expansionary fiscal policy, monetary policy had to be tightened aggressively to bring inflation back to single digit levels and stabilize the kwacha. While successful in restoring confidence in the macroeconomy, the tight liquidity further constrained the private sector.

6. In 2017, the economy has improved, led by a recovery of copper prices and a bumper 2016–17 harvest, but growth remains below the rates achieved before 2014 and will be insufficient to significantly reduce poverty. A key factor is continued weak growth in the services sector. Hence, growth is forecasted to improve only modestly to 3.8 percent in 2017, from 3.6 percent in 2016. This reflects the contrastingly strong growth in agriculture, electricity generation, and transport and communication. Despite these developments, fiscal and debt challenges remain elevated as revenues have fallen short of target, while domestically financed expenditures remained on course. Rapid debt accumulation has increased the risk of debt distress and will remain a source of vulnerability over the medium term.

(ii) Sector Context

7. Around 85 percent of total installed electricity generation capacity in Zambia is hydropower. Since this capacity is located along one main – Zambezi river – basin, the sector is vulnerable to rainfall variability with the power shortages of 2015–16, being a case in point. The power shortages had significant fiscal impact, with unplanned additional costs of emergency power imports imposed on Zambia Electricity Supply Corporation Limited (ZESCO) finances in the order of over US\$350 million. The GRZ recognizes the risk that the current primary energy mix presents and has a stated objective of diversifying electricity generation resources to avert the recurrence of the recent power shortages.

8. The GRZ has been in discussions with the International Monetary Fund (IMF) on an economic recovery program. Progress on concluding the program has, however, been slow and this has delayed a planned budget support operation by the African Development Bank (AfDB) that focuses on the energy sector and a World Bank Development Policy Operation focused on the agriculture sector.

9. Despite the slow progress on the AfDB budget support operation, the GRZ has initiated steps aimed at improving efficiency, attracting private sector investment, and enhancing competition in the power sector. As part of this, and in response to the need to diversify electricity generation, the 120 MW Itezhi-Tezhi Hydro Power Station (jointly owned by ZESCO and Tata Power of India) and the 300 MW Maamba Collieries coal-fired independent power producers (IPPs) were commissioned in 2016. In the meantime, the GRZ has formed an internal task force to come up with sector reforms action plan by end-2017 and has carried out a series of consultations with stakeholders, including the World Bank, on the planned reforms. To this effect, the World Bank supported the GRZ in conducting a high-level brainstorming session with a panel of global experts in June 2017. Also, in April 2017, the Energy Regulation Board (ERB) approved a retail (non-mining) tariff increase of 50 percent effected in May 2017 and an additional 25 percent that was effected in September 2017, although this had a relatively marginal positive impact on the financial situation, given the simultaneous increase in the threshold for



the lifeline tariff to 200 Kilowatt-Hour (kWh) per month. The GRZ has also embarked on tariff negotiations with the mining sector which consumes close to 60 percent of all power generated in Zambia. Most of the mining companies have agreed to pay a higher interim tariff while awaiting the results of a cost of service study (CoSS), which is currently underway and which will inform future tariff setting and the path to cost reflectivity in the power sector.

10. With the higher rainfall recorded during the 2016–17 rain season and commissioning of new plants, electricity shortages have eased. However, the sector continues to face some near-term challenges. The most pressing of these relate to ZESCO’s financial situation, which remains fragile. Given that expected transfers from the GRZ to ZESCO were not always on time and there were delays in reaching a conclusion on electricity tariffs to the mining sector, ZESCO has experienced serious cash flow difficulties. This has led to mounting arrears to power suppliers, currently at US\$500 million, which threaten overall power sector sustainability. To aid its cash flow situation, ZESCO has been forced to resort to expensive external debt to finance its operations¹ and investment needs. While providing temporary relief, this has had a negative impact on the utility’s creditworthiness. The GRZ recognizes the significance of the situation and is considering various options to address it. In the near term, ZESCO is exploring debt refinancing options and is in the process of hiring a transaction advisor to assist with the selected option. Discussions for the new Country Partnership Framework (CPF), which is currently under preparation, will include options through which the World Bank could support the GRZ in implementing its plan to improve the financial situation.

C. Rationale for Additional Financing

11. As part of the strategy to diversify generation, the GRZ has embarked on a strategic partnership with the WBG through the Scaling Solar initiative. Scaling Solar brings together a suite of WBG services and instruments under the umbrella of a single engagement aimed at creating viable markets for grid-connected solar PV power plants and enabling governments and utilities to procure solar power in a competitive and transparent manner. Following the successful Round 1 solar tender in Zambia, other countries such as Madagascar, Ethiopia, and Senegal also engaged in the Scaling Solar initiative. The GRZ has also requested IDA guarantees to support future rounds of Scaling Solar tenders for up to a total capacity of 500 MW.

12. In May 2016, about nine months after the start of the WBG engagement, the Industrial Development Company (IDC)² awarded the first two projects under Zambia’s Scaling Solar Round 1 tender. The two winning bidders, both offering flat tariffs for 25 years, were (a) a consortium of Neoen/First Solar with a US\$6.015 per kWh tariff, the lowest for solar energy in Sub-Saharan Africa at that time (the West Lunga-Bangweulu Project);³ and (b) Enel Green Power (EGP) with a US\$7.839 per

¹ ZESCO meets salary payments from short-term borrowing due to the scale of the wage bill. Ideally, the company should be able to meet its recurrent costs from its operating cash flow.

² The IDC was incorporated in 2014 as a company limited by shares under the Companies Act, is 100 percent owned by MoF, and is chaired by the President of the Republic of Zambia. The IDC’s role is to own and manage the assets of state-owned enterprises previously held through direct MoF shareholding. It is expected that by so doing this will allow the MoF and other line ministries to focus on policy making while the IDC operates the state-owned enterprises following commercial principles. On August 24, 2015, the MoF transferred its entire interest in ZESCO to the IDC along with those in 33 other companies.

³ The recent tender in Ethiopia led to an even lower starting tariff of US\$5.9 but that tariff carries an annual indexation of 2.00 percent per year. As such, the Scaling Solar Neoen Project still remains, to date, the lowest solar PV tariff in Africa.



kWh tariff, the second lowest tariff bid (the Ngonye Project). Both projects had requested in their bids an IDA guarantee offered in the bidding documents. It was GRZ/IDC's decision to award two separate projects to two different bidders rather than a single lowest bidder in order to (a) crowd-in more potential investors, (b) maximize demonstration effect, and (c) diversify and, therefore, mitigate execution risks. The Ngonye Project's tariff, being the second lowest, although higher than that of the West Lunga-Bangweulu Project, is still highly competitive as an IPP in the Zambian and the Sub-Saharan Africa context.

13. The proposed Ngonye Project is a 34 MWp (28.2 MW AC) grid-connected solar PV power plant. The IDA guarantee and IFC investment support scaling renewable energy in Zambia and will crowd in private sector investments. The Ngonye project shares the same contractual framework, financing instruments (IFC A loan, a senior loan from IFC acting as the implementing entity of the International Finance Corporation-Canada Climate Change Program [IFC-CCCP], swaps, and IDA guarantee), safeguard category, and policies as the West Lunga-Bangweulu Project.

14. The Ngonye project is aligned with the GRZ's Seventh National Development Plan (2017–21), which recognizes the need to diversify the energy generation mix and enhance the energy sector's contribution to the overall economy. The expansion of generation capacity and the promotion of renewable energy such as solar, are among the priorities of the plan.

15. The Ngonye project is aligned to the existing Country Partnership Strategy for FY13–16,⁴ which identifies critical infrastructure gaps in Zambia, including in power supply, constraining the competitiveness of its private sector. This project will increase Zambia's power generation capacity and increase the reliability and security of power supply, reducing the current infrastructure constraints Zambia is facing in its electricity sector. A new CPF is currently under preparation and electricity infrastructure is expected to be an integral part of it. Scaling Solar is also in line with the WBG's Africa Climate Business Plan, which calls for accelerating the development of climate-resilient and low-carbon energy resources.

D. Performance of the Original Project (West Lunga-Bangweulu) and Lessons Learned

16. The West Lunga-Bangweulu Project was approved by the Board on February 16, 2017. After resolving the last outstanding points with the GRZ over the past months, the Special Purpose Vehicle (SPV) and its financiers, including IFC, signed the financing documents on October 20, 2017. The WBG's support, within the Scaling Solar framework, was key in helping the GRZ successfully close this first project. It paves the way for signing and making the IDA guarantee effective by end-January 2018. The latest Implementation Status and Results Report rates the performance of the West Lunga-Bangweulu Project satisfactory.

17. There are important lessons to be learned from West Lunga-Bangweulu. To the extent possible, these lessons are reflected in the design of the Ngonye Project and will be reflected further in the planned Round 2 Scaling Solar Zambia tender. West Lunga-Bangweulu is the first privately developed and project-financed grid-scale solar PV project in Zambia. As such, the GRZ, including the Ministry of Energy (MoE), ERB, and ZESCO, went through a steep learning curve. While the upfront work done as

⁴ Report 75089-ZM



part of the Scaling Solar package helped, the sixteen-month period between the award and financial closure is longer than originally expected. This is nevertheless still substantially shorter when comparing with the procurement of the majority of Independent Power Producers (IPP) projects in Sub-Saharan Africa.

18. A key lesson is that the Government's commitment is indispensable. While the GRZ's commitment to scaling up solar generation remained strong, the complexity of the IPP/guarantees/private financing structure of Scaling Solar meant that it took time for all the parties to become fully aware of the related documentation and the respective roles and responsibilities. This led to some delays at key decision-making points. The West Lunga-Bangweulu Project was also the first project of its nature to be sponsored by the IDC, which at the time was only just beginning to establish its role of a ZESCO shareholder. The initial success in obtaining competitive prices and sustained efforts supported by the WBG helped obtain full support from all the GRZ entities, better understand the respective roles and responsibilities, and improve collaboration among GRZ agencies, financiers, and developers. The GRZ established a working group among all stakeholders which met regularly during the final stages of financial closing and this is expected to be retained for further rounds.

19. Future rounds, particularly Round 2 under preparation, will incorporate lessons learned, including, in particular:

- (a) Better clarity of roles and responsibilities within the GRZ and closer MoE involvement, including the possibility of a steering committee modelled along the lines of the working group convened in recent months, leading to the recent signing of financing agreements for the West Lunga-Bangweulu Project;
- (b) Stricter pre-tender due diligence, especially regarding land ownership, land rental agreements, and geotechnical studies;
- (c) Improvements and simplification, where possible, of the project documents; and
- (d) Stricter enforcement of the non-negotiable nature of project and Letter of Credit (LC) documents attached to their respective Request for Proposals (RFP); the use of the final documents from Round 1 as the basis for Round 2 will help as the GRZ, sponsors, lenders, IDA, and other stakeholders' comments have now been all reflected.

20. The Ngonye Project, and the overall Scaling Solar Program, are practical examples of the MFD approach. This is different from the traditional public financing approach and as such it takes time to build capacity and experience within Government on how to facilitate it. The soft skills and experience developed by the GRZ via Round 1 in dealing with private sector sponsors and lenders in a competitive and transparent framework will be very valuable for further rounds as well as for other privately financed infrastructure projects. Scaling Solar Zambia also enhanced the visibility and attractiveness of the country for private investors. By bringing in private investors and Development Finance Institutions (DFIs), the GRZ has freed up public and IDA concessional funds that can be used in other subsectors where commercial financing is harder to raise.



II. DESCRIPTION OF ADDITIONAL FINANCING

A. PDO

21. The PDO is to increase solar electricity generation capacity and diversify electricity generation sources in Zambia.

B. PDO Level Results Indicators

22. Progress toward achieving the PDO will be measured by the following indicators, which are the same as for the original West Lunga-Bangweulu Project, and will be revised upwards to account for the AF:

- (a) Generation capacity of energy constructed (MW) - Core
- (b) Solar PV plants constructed (number)
- (c) Reduction of greenhouse gas (GHG) emissions, annual (tCO₂)
- (d) Installed solar PV generation capacity (percentage); and
- (e) Private capital mobilized⁵ (US\$, million) – Core

C. Project Beneficiaries

23. The direct project beneficiaries are:

- (a) ZESCO, as the project will contribute to diversify its electricity generation sources, reduce vulnerability to hydrological risks, and optimize natural resource (that is, solar energy) use;
- (b) The Ngonye Project, its shareholders and its lenders, who will indirectly benefit from the IDA guarantee; and
- (c) The bank providing the LC, which will directly benefit from the IDA guarantee.

24. The ultimate beneficiaries will be the electricity consumers of Zambia as the new power plant will contribute to the availability and reliability of electricity services. The Ngonye project will also support the GRZ's efforts to create an enabling environment for private sector financing. Finally, the project introduces a structured framework for the transparent and competitive procurement of new electricity generation with improved cost and technology benefits.

D. Project Description

25. The Ngonye Project is led by EGP and consists of the development, financing, construction, and operations and maintenance (O&M) of a new 34 MWp (approximately 28.2 MW AC) solar PV plant. The

⁵ Refers to equity investment from a private sponsor.



project is located in the Lusaka South Multifacility Economic Zone (MFEZ) next to the West Lunga-Bangweulu Project. It will generate around 61 Gigawatt-hour (GWh) per year, to be sold to ZESCO under a 25-year Power Purchase Agreement (PPA).

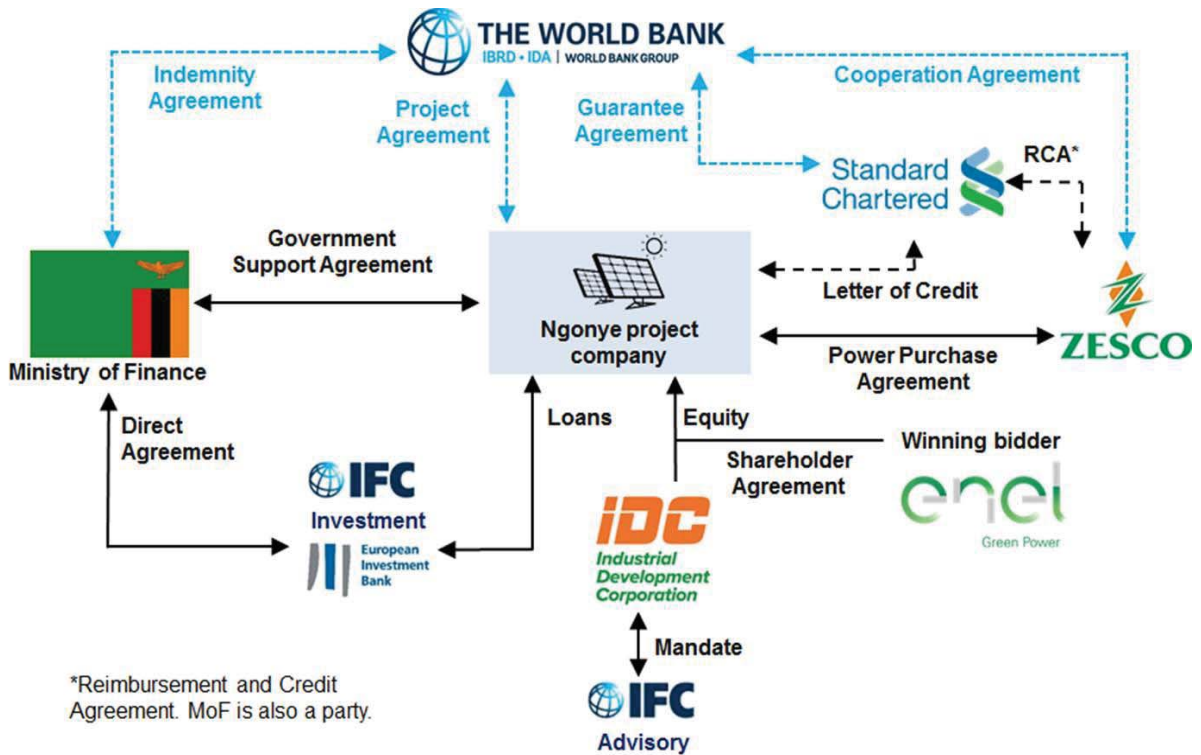
26. Enel S.p.A. (Enel), the parent company of EGP, is Italy’s largest power company and Europe’s second largest utility with an installed capacity of 90 GW. The company is active in both the power and gas sectors and owns one of the world’s largest portfolios of renewable energy assets through its renewables division, EGP. EGP was formed in 2008 as a spin-off of Enel’s renewable energy assets and rejoined Enel in 2016 through a strategic restructuring, in which EGP was delisted and brought under Enel’s full ownership. EGP is one of the largest renewable energy developers/operators worldwide, with 38 GW of assets globally, and a prominent investor in Africa.

27. EGP and IDC signed their Shareholder Agreement on November 11, 2016. On April 3, 2017, Ngonye Power Company Limited (the Project Company), signed a PPA with ZESCO and a Government Support Agreement (GSA) with the GRZ.

E. Proposed Structure

28. The project will be implemented by Ngonye Power Company Limited, an SPV incorporated under the laws of Zambia. The Project Company is co-owned by EGP (80 percent) and IDC (20 percent) with responsibility for designing, financing, developing, commissioning, operating, and maintaining the proposed solar PV plant. Figure 1 reflects the project’s contractual structure.

Figure 1. The Ngonye Project Contractual Structure





29. For the Ngonye project, the roles and responsibilities of the MoF, MoE, IDC, and ZESCO are as follows:

- (a) MoF, on behalf of GRZ, to enter into a GSA with the Project Company (defining, in particular, GRZ commitment to support implementation and eventual termination payments), an Indemnity Agreement with IDA (by which MoF commits to reimburse IDA in case of a call on the guarantee), and a Direct Agreement with the lenders to the Project Company (defining how the lenders can interact with GRZ).
- (b) MoE to provide policy direction to IDC and ZESCO on the procurement of solar PV generation capacity, with the MoE Permanent Secretary a member of ZESCO's Board of Directors.
- (c) IDC, on behalf of GRZ and as directed by MoE, to conduct the competitive procurement of the solar PV power plant, in addition to cosponsoring and retaining up to a 20 percent interest in the Project Company.
- (d) ZESCO to enter into a PPA with the Project Company and, under the terms of the PPA, to procure an LC in favor of the Project Company. The PPA defines the conditions of purchase of electricity by ZESCO, including the LC as a security against potential ZESCO default in the settlement of PPA invoices

30. Several WBG instruments are involved, reflecting Group-wide collaboration:

- (a) **IDA** will provide a payment guarantee of up to US\$2.8 million, which will backstop the security mechanism (that is, LC) in case of a draw that the GRZ or ZESCO have not reimbursed after 12 months. ZESCO has selected Standard Chartered Bank as the LC bank through a transparent and competitive process. The indicative terms and conditions of the IDA guarantee are included in annex 3 (IDA Payment Guarantee Term Sheet).
- (b) **IFC** will provide (i) an A Loan of up to US\$12 million, (ii) a senior loan of up to US\$12 million from IFC acting as the implementing entity of the IFC-CCCCP, and (iii) one or more U.S. dollar interest rate swaps to hedge the interest rate risk in respect of the senior debt comprising the project financing in a notional amount of up to US\$36 million, representing a Loan Equivalent Exposure to the Project Company of up to US\$2.5 million. Further, IFC investment has signed a mandate with EGP, the lead sponsor, to act as the lead arranger for the project's financing, under which IFC will mobilize an additional US\$12 million of long-term financing expected to come in as a parallel senior loan from the European Investment Bank (EIB). IFC's Advisory Services is the transaction advisor to the IDC in the implementation of the Scaling Solar Program in Zambia.
- (c) **Multilateral Investment Guarantee Agency** political risk insurance has been offered but not requested for this project by the investors.

31. The economic capital exposure for the proposed IFC investment is up to US\$2.9 million. As of November 19, 2017, IFC's economic capital exposure to Zambia and to Enel was US\$34 and US\$18 million, respectively.



F. AF Project Cost and Financing

32. Total Ngonye Project cost is estimated at US\$48 million. The private sponsor is planning to finance the project on a limited recourse basis with a debt to equity ratio of up to 75:25. EGP will thus provide about US\$12 million in equity/equity-like instruments. IFC for its own account, IFC acting as the implementing entity of the IFC-CCCP, and EIB are expected to provide the entire senior debt for the project. Table 1. reflects indicative Ngonye Project costs, financing structure, and IDA guarantee.

Table 1. Indicative Ngonye Project Costs, Financing Structure, and IDA Guarantee

Project cost	US\$48.0 million
Equity	US\$12.0 million
Debt from DFIs	US\$36.0 million
Private capital mobilized	US\$9.6 million
IDA payment guarantee	US\$2.8 million

G. Rationale for IFC Blended Finance Involvement

33. Debt financing for the Ngonye Project will include a concessional senior loan from IFC acting as implementing entity of IFC-CCCP, which is funded by a Can\$291.55 million contribution from the Government of Canada, as part of Canada's FY2010 Can\$400 million commitment under the Copenhagen Accord. The IFC-CCCP loan is managed by the IFC Blended Finance Department in collaboration with the IFC Investment Services team arranging the financing package. Inclusion of the IFC-CCCP loan within the IFC stapled finance offering at the bidding stage of the tender enabled a more sustainable tariff, given market realities in Sub-Saharan Africa before the launch of Scaling Solar and hence improved affordability of power for end-users in Zambia. The RFP included the blended finance loan terms so that bidders could reflect them in the financial calculations of their tariff. This and the competitive process ensure that the benefit of the concessionality is passed through to the customers via a lower tariff.

34. Application of principles of IFC Blended Concessional Finance includes the following:

- (a) **Moves beyond IFC additionality/rationale for blended finance.** The blended finance concessionality is specifically targeted to improve the affordability of power from solar PV to electricity consumers in Zambia. Blended finance would also enable rapid deployment of competitively priced solar electricity, which in turn will (i) reduce Zambia's heavy dependence on hydropower, whose availability is vulnerable to climate change impacts; (ii) help address energy shortages in the country; and (iii) displace the use of expensive thermal power which is susceptible to fuel price and supply volatility.
- (b) **Minimizes market distortion.** As the terms of the proposed concessional funds were offered upfront to all qualified bidders participating in Scaling Solar in Zambia, the benefit of the embedded subsidy is designed to be passed through to power consumers in Zambia in the form of lower tariffs. Under a base case scenario, it is estimated that the IFC-CCCP loan reduces the final tariff by 13 percent.
- (c) **Contributes to sustainability.** The Ngonye Project will send a strong signal to other



governments in the region on how to develop financially sustainable solar PV-based power through private sector investment. This is well-aligned with the GRZ's efforts to broadly improve the energy sector, as demonstrated through the current implementation of tariff reforms which are expected to improve the financial health of the state-owned utility ZESCO. The market creation impact of the Ngonye Project is further highlighted in paragraph 44.

- (d) **Promotes transparency.** Approval to use concessional funds for this project was received on November 16, 2017 through an independent process from IFC's Blended Finance Committee. The availability of a separate IFC-CCCP loan in the financing package has been made clear to all stakeholders and bidders.

III. KEY RISKS

35. The overall risk of the proposed Ngonye Project remains substantial and is consistent with the West Lunga-Bangweulu Project as both are parts of Scaling Solar Round 1. Despite the recent positive developments in the power sector since the approval of West Lunga-Bangweulu, as reflected in the sector context section above, the Sector Strategies and Policies risk remains high, primarily due to the unsustainable financial situation in the sector. Even though most other risks are considered lower given the experience gained and capacity built in the GRZ and other key stakeholders in the first project, the Political and Governance and Institutional Capacity risk ratings remain substantial. The full Systematic Operations Risk-rating Tool (SORT) table is provided in the datasheet. Details of risks identified as substantial are provided in the following paragraphs.

36. **Sector strategies and policies.** The GRZ's commitment to continuing with reforms remains strong and, since the approval of the original, West Lunga-Bangweulu Project, the risk related to sector strategies and policies has reduced. The GRZ has continued taking important steps toward energy sector reforms, including eliminating fuel subsidies in 2016. It decided to not use AfDB funding toward a ZESCO restructuring consultancy and, instead, has formed an internal task force to expeditiously come up with a sector reform action plan by end-2017. Taking difficult decisions on raising retail tariffs and embarking on negotiations on raising mining sector tariffs since the approval of the West Lunga-Bangweulu Project reflect the existing GRZ's strong political will. The GRZ has further reconfirmed its commitment to reach cost recovery tariffs in the medium term, following completion of the CoSS. The WBG has maintained close engagement in the Zambia energy sector, with lending operations ranging from generation to transmission to distribution and access. The WBG also provides support to the counterparts through a number of TA activities, such as renewable energy mapping, investment planning, and geospatial system planning. Furthermore, under the new CPF framework, discussions with the GRZ are ongoing with regard to identifying priority areas for WBG support in the next few years and the energy sector is expected to be reflected there. These engagements, many of them having MoE and ZESCO as implementing agencies, will help continue maintaining strong sector policy dialogue with the GRZ and enable close monitoring of the sector development and financial situation during the implementation of this project.⁶

37. **Sector financial situation.** The risk related to the financial situation of the electricity sector and

⁶ Customary financial reporting covenants will be included in the Cooperation Agreement with ZESCO.



of ZESCO remains high. After the approval of the original West Lunga-Bangweulu Project in February 2017, the GRZ has taken initial steps to raise retail tariffs (by 50 percent in May 2017 and by 25 percent in September 2017). These increases did not include the mining tariffs⁷ and, hence applied to only half of ZESCO's revenue base. Furthermore, a simultaneous increase of the ceiling for the lifeline tariff to 200 kWh/month resulted in only a marginal positive effect from the tariff increases on ZESCO's finances. Currently, ZESCO is exploring debt refinancing options and is in the process of hiring a transaction advisor. The World Bank will continue to closely monitor this effort and explore the role the WBG can play in addressing the financial situation of the sector within a new CPF under preparation.

38. **Political and governance.** The roles of MoE, IDC, and ZESCO have been defined as policy maker, shareholder, and operator, respectively. These remain intact for the proposed Ngonye Project, but may need to be adjusted for subsequent rounds to address a lack of coherently adopted arrangements with regards to leadership of competitive procurement of solar PV capacity.

39. **Institutional capacity.** Overall institutional capacity has improved, following the processing of the original West Lunga-Bangweulu Project, but remains limited with some of the GRZ entities. The experience of the West Lunga-Bangweulu Project provided a significant learning experience in the project preparation stage and the risk for this project is lower, given Round 1 under the West Lunga-Bangweulu Project allows to pilot and test certain approaches. However, a continued effort is required to retain the gains.

IV. APPRAISAL SUMMARY

A. Economic and Financial Analysis

40. **Cost-benefit analysis.** Economic analysis confirms that the proposed Ngonye Project is economically viable. The project is estimated to generate approximately 61 GWh of electricity per year on average over the project life (25 years). The main cost items are capital investments for the PV plant and O&M costs. Benefits are valued at the consumers' willingness-to-pay (WTP) at US\$13.7 per kWh.⁸ GHG emissions would also be avoided with the social cost of carbon valued at the range of US\$34 per tCO₂ to US\$39 per tCO₂ in accordance with the 2014 Guidance Note.⁹ Under these assumptions, the net present value (NPV) of the Ngonye Project at a 6.6 percent discount rate is US\$37.3 million (US\$28.9 million without GHG emission benefits), and the economic internal rate of return (ERR) is 18.1 percent (14.7 percent without GHG emission benefit). These figures demonstrate robust economic returns. Details are in annex 1.

41. In the World Bank's 2017 draft Guidance Note on Shadow Price of Carbon in Economic Analysis, carbon emissions are valued at 'high' and 'low' levels, both increasing at a rate of 2.25 percent per year. Under this guidance, the NPV and ERR of the Ngonye Project increase to US\$38.6 million and 18.6 percent in the low case and US\$48.2 million and 23.2 percent in the high case.

42. **Rationale for public provision.** Public sector financing for the IDA guarantee is appropriate for

⁷ Tariffs for majority of the mines are reflected in respective Power Supply Agreements and are not regulated by ERB.

⁸ ESB International (Electricity Supply Board). 2015. Feasibility Study for the Project "Sustainable Electricity Supply Southern Division", commissioned by the Government of Germany.

⁹ Social Value of Carbon in Project Appraisal Guidance Note 2014.



the Ngonye Project, as it will provide public sector financing to promote private sector investment with a lower tariff. IPP investments in Sub-Saharan African countries often result in higher tariffs due to perceived risks of nonpayment by power utilities. The IDA payment guarantee de-risks the project through off-taker credit risk cover, helping the country attract investors and lenders. The US\$2.8 million IDA guarantee leverages US\$48 million of investments.

43. **Value added of the WBG's support.** WBG support for the Ngonye Project is critical for providing confidence to investors in the sector. Given the risk perception of investors toward Zambia and the weak credit profile of the off-taker, the anticipated scale-up in private investment would not be feasible without the intervention of credit enhancement. Not only is the project helping crowd in much needed private capital, but it is also aligned and embedded in a strong sectoral dialogue with the authorities. In addition, the WBG's technical assistance and overall support for the Scaling Solar initiative adds significant value to the sector and assists with the goal of increasing the supply of energy in the country.

44. **Project's expected development impact.** The proposed Ngonye Project has an Anticipated Impact Measurement and Monitoring (AIMM) rating of 'Good' mainly driven by its market creation impact. The Ngonye Project is one of two projects selected in Round 1 of the Zambia Scaling Solar Program, which represents the first implementation of the WBG Scaling Solar Program. It sets a precedent of competitive tendering being used in Sub-Saharan Africa to procure low cost energy, a framework for WBG to engage with various government entities, and a unique package of instruments and services offered by the WBG to mitigate off-taker risk and crowd-in private sector investment. It is a product of a market creation effort in which extensive WBG engagement in the power sector of Zambia, including IFC transaction advisory services provided to the program's implementing agency in Zambia—IDC, created investment opportunities for the private sector. The successful conclusion of Round 1 of the program in Zambia will demonstrate its viability and confirm its replicability both within Zambia (enabling implementation of Round 2) and in other countries in Sub-Saharan Africa. It is expected that 300 MW of solar power projects will be procured during Round 2 of the program. Moreover, there is evidence that the successful conclusion of the first tender of the Scaling Solar Program in Zambia—the pioneer country—is facilitating the implementation of similar programs across Sub-Saharan Africa, providing transparent opportunities for private sector involvement. The Ngonye Project also contributes to improving the resilience of the power system which is currently heavily hydropower-based and thus susceptible to hydrological risk. By increasing the share of climate-resilient renewable energy capacity, the project also help improve the financial resilience of the sector. Lastly, it marginally improves the carbon footprint of the power sector in Zambia.

45. **Financial impact of the Ngonye Project.** The financial analysis confirms the financial benefits of the proposed project to Zambia's electricity sector. To assess the financial implication of the project on the sector, the analysis compared costs of power procurement by the project and the latest contracted IPPs, and assessed the size of financial gain due to the project. The tariff that ZESCO pays as the off-taker for the project is US\$7.893 per kWh which is not indexed to inflation and remains constant. The cost of IPPs recently contracted by ZESCO is estimated between US\$8.7–9.8 per kWh. The result of the comparison analysis shows that the project will allow the sector to gain US\$6.47 million to US\$14.7 million as compared to the latest contracted power purchases. The financing of the project is structured based on a maximum 75:25 debt-to-equity ratio. The total project cost is estimated to be approximately US\$48 million, and is to be financed through at least US\$12 million equity and up to US\$36 million debt. The forecasted cash flow of the project is expected to be sufficient to cover debt service payments to the lenders and allow equity returns to sponsors, provided that payments under the PPA are current.



B. Technical

46. Zambia has good solar resources. An Energy Sector Management Assistance Program-funded activity for solar resource mapping in the country¹⁰ shows that the daily average Global Horizontal Irradiation (GHI) ranged from 4.81 to 6.60 kWh/m². For Lusaka, the daily average GHI range was 4.96–6.44 kWh/m². There are a variety of sources of historical solar irradiation data¹¹ that have been assessed. The daily average GHI for other sources ranges from 5.39 to 5.76 kWh/m².

47. The grid can easily integrate the Ngonye Project. The introduction of significant amounts of variable renewable energy (VRE) into a grid can present operational challenges. However, the threshold for VRE installed capacity is typically significantly higher for hydropower systems with storage, as is the case in Zambia. A hydropower-dominated system which allows the fast ramp-up/ramp-down of generation offers strong complementarity with solar PV power. ZESCO, with the support of WBG, has recently completed a study analyzing the impact of utility scale solar PV power plants (typical size around 50 MW) on the transmission system and determining the maximum and optimum solar generation capacity that can be integrated in ZESCO's system over the study period (up to 2022), without requiring major transmission reinforcements. The study also included the identification of potential connection points on the grid. The study concluded that up to 700 MW (approximately) of solar capacity can be connected to the network without needing major system reinforcements by 2019, and up to 1,000 MW (approximately) by 2022.

48. The proposed Ngonye Project site is found suitable. Initially, ZESCO identified six towns/cities across its network, which had daily load profiles most suitable for solar PV supply. Based on this initial identification, IDC indicated availability of potentially suitable land at the selected site, which was confirmed by an assessment by IFC Advisory. The project site is located next to the 150 MVA Lusaka South MFEZ substation, which provides sufficient capacity to evacuate solar PV, thus substantially reducing costs. Further, a desk study has been carried out to examine potential yields for a standardized PV crystalline silicon power plant across the six sites initially identified by ZESCO. It concluded that the five alternative sites would not have had substantially higher yields (this was verified by an independent engineer).

49. The central concept on the technical side of the procurement process was to ensure that only highly experienced bidders would be prequalified and that they would be incentivized to maximize the energy yield of the plants. Furthermore, to guarantee that the plants would be of suitably high quality, a demanding set of technical requirements was developed to cover key elements of the plants and the capabilities of the main contractors. The technical requirements were set out in the RFP and the technical schedules in the PPA.

50. The Ngonye Project will use polycrystalline PV modules as the chosen technology with a single-axis tracking system using a backtracking algorithm to minimize inter-row shading. JA Solar, the supplier of the PV modules, is a well-established company with a strong track record of supplying modules to commercial and utility-scale PV projects internationally. The modules are judged to be of high quality and provide low risk to the project. ZESCO is responsible for providing the evacuation facilities at the

¹⁰ Renewable Energy Resource Mapping and Geospatial Planning: Zambia (P145271)

¹¹ Meteonorm v7.1, PVGIS Classic, PVGIS ClimSAF, HelioClim-3, and SolarGIS.



Lusaka South MFEZ substation. The project PV plant will be connected via 33 Kilovolt (kV) underground cables to the 330/132/33/11 kV substation, located adjacently to the panel arrays.

51. Engineering, procurement, and construction (EPC) and O&M responsibilities will lie with Italgast Energy Pty Limited and EGP Zambia Limited respectively, both fully owned subsidiaries of Enel.

52. As required by the Zambia Grid Code, the Project Company will, at its own expense, procure, install, test, and commission the metering system at the delivery point, which will then be transferred to ZESCO. The metering system will include the main meter and a check meter, which measure at least energy and power (both active and reactive), current and voltage (in three phases), frequency, and total harmonic distortion.

C. Financial Management

53. Since the proposed Ngonye Project consists of an IDA guarantee, no disbursements from IDA are anticipated. Hence, the fiduciary role of ensuring that funds are used for their intended purposes is minimal. For the payment guarantees, ZESCO has competitively procured an LC from Standard Chartered Bank and the payment guarantees will cover the LC repayment by the GRZ and ZESCO to that commercial bank, in case of a draw on the LC. Ngonye Power Company Limited, an SPV, will be the primary responsible party for managing the finances of the project. It will install and maintain adequate financial management systems, including the system of accounting, reporting, auditing, and internal controls, and retain suitably qualified staff. The annual financial statements will be prepared in accordance with internationally accepted accounting principles. In addition, they will be audited in accordance with international auditing standards.

54. ZESCO has successfully managed various World Bank-funded projects, including the Increased Access to Electricity Services Project (P077452), which closed in June 2015. Ongoing projects include the Lusaka Transmission and Distribution Rehabilitation Project (P133184), the Kafue-Muzuma-Victoria Falls Regional Transmission Line Reinforcement Project (P124351), and the recently approved Electricity Service Access Project (P162760), all with adequate financial management arrangements in place. Therefore, the residual financial management risk rating has been assessed as Low.

D. Procurement

55. The World Bank 'Procurement Regulations for Investment Project Financing (IPF) Borrowers' govern the procurement of goods, works, non-consulting services, and consulting services financed by the World Bank (in whole or in part) through IPF operations. According to Section I.1 of the Procurement Policy, procurement under World Bank guarantees are excluded from these regulations.

56. The goods and related works and non-consulting services have nevertheless been procured with due attention to economy and efficiency. The Ngonye Project involves the identification and sourcing of solar PV IPPs through an open bidding process. IFC, a member of the WBG, through its IFC Advisory division, was the transaction advisor to the GRZ on this process and ensured high standards of transparency and competitiveness. The World Bank team reviewed the bid documentation prepared and found that the competitive and transparent process, in addition to the low prices obtained, was in line with good practices for tendering renewable projects and meets the economy and efficiency criteria. This is the same process that was presented to the management and Board of Directors of IDA



for the West Lunga-Bangweulu Project, approved in February 2017.

a. Social (including Safeguards)

57. The Ngonye Project's rating categorization is Category B (same as the original West Lunga-Bangweulu Project) since the proposed investment is expected to have limited impacts, that are site-specific and temporary. Those impacts can be avoided or mitigated by adhering to applicable performance standards (PSs), procedures, guidelines, and design criteria. The categorization is consistent with the categorization of other similar projects within this subsector.

58. Six of the eight PSs are applicable to the project. The PSs relevant to social aspects that are triggered are PS 1 - Assessment and Management of Environmental and Social Risks and Impacts; PS 2 - Labor and Working Conditions; PS 3 - Resource Efficiency and Pollution Prevention; PS 4 - Community Health, Safety, and Security; and PS 5 - Land Acquisition and Involuntary Resettlement. There is no resettlement directly associated with the site. However, before the Ngonye Project, a process of resettlement was undertaken by the Government for the greater Lusaka South MFEZ (of which the project site represents only 2.2 percent). Although this is not a direct responsibility of the project, the Project Company is committed to addressing residual impacts and potential risks associated with this historic resettlement on a best efforts basis by offering community-level benefits through a Community Development Plan, including projects such as improved social services, access to credit, and/or livelihood improvement measures.

59. The appraisal considered the E&S management planning process and documentation for the project and gaps, if any, between these and IFC's requirements. Where necessary, corrective measures, intended to close these gaps within a reasonable period, are identified. Through the implementation of these measures, the project is expected to be designed and operated in accordance with PS objectives. A complete Environmental and Social Review Summary (ESRS) with a detailed action plan has been disclosed on the IFC website (<https://disclosures.ifc.org/#/projectDetail/ESRS/37811>) on October 17, 2017.

E. Environment (including Safeguards)

60. As was the case with the West Lunga-Bangweulu Project, the Ngonye Project is prepared in accordance with OP 4.03 Performance Standards¹² (PS) for Private Sector Activities. The site for the first two IPPs is within a fenced and enclosed industrial park of Lusaka South MFEZ. This is a Category B project as the proposed investment is expected to have limited environmental and social impacts, which are site-specific, temporary, and insignificant. The categorization is consistent with categorization of other similar projects within this sub-sector. Those impacts can be avoided or mitigated by adhering to applicable PSs, procedures, guidelines, and design criteria. A complete Environmental and Social Review Summary (ESRS) with detailed action plan has been prepared and disclosed on October 17, 2017.¹³

61. IFC has previously invested in another Enel renewable energy project (Enel Wind Brazil, IFC Project ID 33579) with a Category A rating. The client is up-to-date in addressing E&S action items for

¹² For IDA, OP/BP 4.03 World Bank Performance Standards for Private Sector Activities are applied to this guarantee project and IFC is leading the environmental and social due diligence work.

¹³ The ESRS is available at <https://disclosures.ifc.org/#/projectDetail/ESRS/37811>



this transaction and the E&S performance for the project is currently rated Satisfactory. The capacity of the EPC/O&M contractor to manage social, environmental, and safety performance and engage with project stakeholders is sufficient. IFC and the World Bank will jointly monitor the application of PSs.

62. Six of the eight PSs are applicable to the AF. The three PSs relevant to environmental aspects are PS 1 - Assessment and Management of Environmental and Social Risks and Impacts; PS 3 - Resource Efficiency and Pollution Prevention; and PS 6 - Biodiversity Conservation and Sustainable Management of Living Natural Resources. At the national level, the project falls within the 2nd Schedule of the Zambia Environmental Management Agency (ZEMA) Environmental Impact Assessment (EIA) regulations of 1997, and accordingly IDC has developed an Environmental and Social Impact Assessment (ESIA)/Environmental and Social Management Plan (ESMP) and submitted it to ZEMA for approval before commencement of works, which in turn has been transferred to the Project Company. The SPV will be responsible for compliance with and implementation of the ESIA and ESMP.

63. To accommodate the Ngonye Project, the GRZ, through IDC, acquired an additional 11.9 hectares of land outside of the Lusaka South MFEZ, which is on the edge of the Lusaka National Park. The 11.9 ha (representing 0.1 percent of the National Park, was previously farmland and is comprised of modified / degraded habitat. IDC and the project have been granted lease of the land by the Ministry of Finance, who are the official designated title holder by the Department of National Parks and Wildlife and the GRZ. The additional land was subjected to the project's ESIA which has been approved by ZEMA. As part of the ESMS, the company will formalize existing engagement with the protected area's stakeholders to ensure the development continues to align with management objectives outlined in the Government Act for the protected area.

64. The construction phase will involve earth works and compaction and will result in loss of vegetation cover. The operation phase will have minimal environmental impacts, but the maintenance and cleaning of solar panels and generated waste will require compliance with PS 3. The cleaning of solar panels will be done with water and this requires efficient utilization of this resource. The ESIA/ESMP will ensure that identified negative impacts are mitigated and positive impacts are enhanced to ensure overall E&S benefits from the project.

V. WORLD BANK GRIEVANCE REDRESS

65. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project-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/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org

**VI. SUMMARY TABLE OF CHANGES**

	Changed	Not Changed
Change in Implementing Agency	✓	
Change in Project's Development Objectives		✓
Change in Results Framework	✓	
Change in Components and Cost	✓	
Change in Closing Date(s)	✓	
Cancellations Proposed		✓
Reallocation between Disbursement Categories		✓
Change in Disbursements Arrangements		✓
Change in Systematic Operations Risk-Rating Tool (SORT)		✓
Change in Safeguard Policies/Performance Standards Triggered		✓
Change of EA category		✓
Change in Legal Covenants		✓
Change in Institutional Arrangements		✓
Change in Financial Management		✓
Change in Procurement		✓
Change in Implementation Schedule	✓	
Other Change(s): Additional Guarantee Expiration Date	✓	
Other Change(s): Project Name	✓	

DETAILED CHANGE(S)**Implementing Agency**

The activities of the first Scaling Solar energy project were to be implemented by Bangweulu Power Company Limited, while the AF activities will be implemented by Ngonye Power Company Limited, an SPV incorporated under the laws of Zambia.

Result Framework

Progress towards achieving the PDO will be measured by the same PDO indicators described in the project paper. The only changes to the results framework is the addition of the Ngonye as a new



location and the end target date to match it to the newly established closing date.

Costs

Costs are revised to account the scope of the AF activities (Ngonye project).

Closing Date

The closing date for the Zambia Scaling Solar Energy – First Round Project (P157943) will be extended from October 15, 2018 to December 31, 2019.

Implementation Schedule

The implementation schedule is 20 months and is similar to the West Lunga-Bangweulu Project. The expected implementation end date for the AF activities (Ngonye Project) is August 15, 2019.

Guarantee Expiration Date

The additional guarantee expiration date is January 31, 2036.

Project Name

The name of the original project is renamed from ‘West Lunga Scaling Solar Energy Project’ to ‘Zambia Scaling Solar Energy Project’ to accommodate the AF project activities.

RESULTS FRAMEWORK

Project Development Objective Indicators

Progress toward achieving the PDO will be measured by the following indicators, which are the same as for the West Lunga-Bangweulu Project:

- (a) Generation capacity constructed (MW) – Core;
- (b) Solar PV plants constructed (number);
- (c) Reduction of GHG emissions (tCO₂);
- (d) Private capital mobilized (US\$ million) – (number) – Core.



FINANCING PLAN

Summary (US\$, millions)

	Original Amount	Proposed Amount
Total Project Cost	60.00	108.00
Total Financing	60.00	108.00
Estimated Private Equity	15.00	27.00
Estimated Debt from Development Finance Institutions	45.00	81.00
Payment guarantee (IDA)	3.50	6.30
Financing Gap	0.00	0.00



VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: REPUBLIC OF ZAMBIA

ADDITIONAL FINANCING TO ZAMBIA SCALING SOLAR ENERGY PROJECT (P163958)

Project Development Objective:

The PDO is to increase solar electricity generation capacity and diversify electricity generation sources in Zambia

Status	Indicator Name	Core	Unit of Measure	Baseline (2016)	End Target (2019)	Frequency	Data Source / Methodology
Revised	Generation capacity of energy constructed	Yes	MW	0	75.7	Semiannual	Quarterly Reports IPI
Unchanged	- Bangweulu			0	47.5		
New	- Ngonye			0	28.2		
Revised	Number of solar PV plants constructed		Number	0	2	Semiannual	Quarterly Reports IPI
Unchanged	- Bangweulu			0	1		
New	- Ngonye			0	1		
Revised	Reduction of GHG emissions (annual)		tCO2	0	148,500	Semiannual	Quarterly Reports IPI



Unchanged	-	Bangweulu			0	97,000		
New	-	Ngonye			0	51,500		
Revised	Share of installed solar PV generation capacity			%	0	2.7%	Semiannual	Quarterly Reports IPI
Unchanged	-	Bangweulu			0	1.7%		
New	-	Ngonye			0	1%		
Revised	Private capital mobilized		Yes	US\$ million	0	24.6	Semiannual	Quarterly Reports IPI
Unchanged	-	Bangweulu			0	15		
New	-	Ngonye			0	9.6		

Intermediate Results Indicators

	Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source / Methodology	Re Co
Revised	Solar energy generation capacity awarded (MW AC)		MW AC	0	75.7	Semiannual	Quarterly Reports	IPI
Unchanged	-	Bangweulu		0	47.5			
New	-	Ngonye		0	28.2			



Revised	Renewable energy generation capacity constructed – Solar (MW AC)		MW AC	0	75.7	Semiannual	Quarterly Reports	IPR
Unchanged	- Bangweulu			0	47.5			
New	- Ngonye			0	28.2			
Revised	Renewable energy generated annually (GWh)		GWh	0	161	Semiannual	Quarterly Reports	IPR
Unchanged	- Bangweulu			0	61			
New	- Ngonye			0	100			
Revised	Physical implementation progress (%)		%	0	100	Semiannual	Quarterly Reports	IPR
Unchanged	- Bangweulu			0	100			
New	- Ngonye			0	100			
Revised	Commissioning test completed (Y/N)		(Y/N)	N	Y	Semiannual	Quarterly Reports	IPR
Unchanged	- Bangweulu			N	Y			
New	- Ngonye			N	Y			



Annex 1: Economic and Financial Analysis

REPUBLIC OF ZAMBIA: Additional Financing for Zambia Scaling Solar Energy Project

A. Economic Analysis

1. This section discusses the rationale for public involvement with respect to the financing of the Ngonye Project, the valued added from the World Bank's support, and presents the analysis of the project's development impact in terms of expected benefits and costs. This economic analysis is consistent with World Bank guidelines.¹⁴

2. **Rationale for public provision.** The IDA guarantee will provide public sector financing to promote a private sector investment with lower tariff. IPP investments in Sub-Saharan African countries often result in high tariffs due to perceived risk of nonpayment by the power utilities. IDA's presence via a guarantee de-risks the project through off-taker risk cover, helping the country attract investors and lenders, enables the participation of IFC and EIB, and also helps lower the tariff of the project. The IDA guarantee has a significant leveraging impact mobilizing US\$48 million with US\$2.8 million of IDA guarantee.

3. **Value added of the World Bank Group's support.** WBG's support for the Ngonye Project is critical for providing confidence to investors in the sector. Given the risk perception of investors toward Zambia, and the weak credit profile of the off-taker, the anticipated scale-up in private investment would not be feasible without the intervention of credit enhancement. Not only is the project helping crowd-in much needed private capital, but it is also aligned and embedded in a strong sectoral dialogue with the authorities. In addition, the WBG's technical assistance and the Scaling Solar initiative support adds significant value to the sector and assists in the goal of increasing the supply of energy in the country.

4. **Methodology and assumptions.** The economic viability of the Ngonye Project is assessed through a cost-benefit analysis. A range of sensitivities that meaningfully reflect the uncertainties of key input variables are evaluated. The analysis includes a consideration of the relevant E&S externalities. The economic analysis rests on the following assumptions:

- **Costs.** The main cost items are capital investment for the PV plant and O&M cost. Contingencies, financial costs (fees, interest during construction period), working capital, and taxes are excluded from the analysis in accordance with World Bank's guidance.¹⁵ The cost of incremental use of power transmission and distribution facilities is not considered as these facilities are already available at the project site.

¹⁴ This economic analysis is consistent with the following World Bank guidelines: (a) Operational Policy and Bank Procedure 10.00 (Investment Project Financing), (b) Power Sector Policy and Investment Projects: Guidelines for Economic Analysis, (c) Social Value of Carbon in Project Appraisal 2014; and (d) Discounting Costs and Benefits in Economic Analysis of World Bank Projects 2016.

¹⁵ Power Sector Policy and Investment Projects: Guidelines for Economic Analysis, Technical Notes, May 22, 2016.



- **Benefits.** The benefits will arise as consumers secure new power supply from the project. The additional electricity made available by the project can be valued at the consumers’ WTP for electricity supply. The WTP analysis is typically based on computing the area under a derived demand curve during each year of the project’s life. The key parameters needed to determine the area under the curve include total demand in each year of the project, the price elasticity of demand, and the marginal tariff. However, given the difficulties in reliably establishing these parameters for Zambia, this economic analysis uses estimates of average WTP for Zambia of ZMW 1.37 per kWh (which is approximately US\$13.7 per kWh at the current exchange rate) from a study¹⁶ that carried out a socioeconomic survey of (randomly selected) 233 households and 38 small businesses in Zambia’s Central and Eastern Provinces.
- **GHG emission.** Externality with respect to GHG emission constitutes an economic benefit of the project. The assumption in this analysis is that the newly generated electricity from the project will go toward replacing diesel power generation. This avoidance will continue till at least 2024 when the 600 MW Kafue Gorge Lower hydroelectric plant may become operational. Consistent with the World Bank guidance on the social cost of carbon, carbon emission reductions are valued at US\$34 per tCO₂ in 2019 increasing to US\$39 per tCO₂ in 2024.
- **Discount rate.** The discount rate has been determined based on the World Bank’s internal guidance, which recommends to use twice the country’s per capita gross domestic product (GDP) growth rate. Given the high volatility of Zambia’s GDP due to its strong linkage with commodity prices, average per capita GDP for the past 10 years has been used, which is found to be 3.3 percent. Therefore, a discount rate of 6.6 percent is used.
- **Others.** Table 1.1 includes key assumptions applied in the economic analysis.

Table 1.1. Key Assumptions

Item	Assumption
General	
Project lifetime	Construction period (1 year) + PPA terms (25 years)
Discount rate	6.6%
Cost	
Capital cost	US\$38.4 million
O&M cost	Increasing from US\$1.18 million in 2019 to US\$1.32 million in 2043
Benefit	
WTP	US\$13.7 per kWh
Generation	64.94 ~ 57.59 GWh/year
System loss	18%
GHG grid emission factor	0.98 tCO ₂ /MWh
Social cost of carbon	34 US\$/tCO ₂ in 2019; 39 US\$/tCO ₂ in 2024

¹⁶ ESB International (Electricity Supply Board). 2015. Feasibility Study for the Project “Sustainable Electricity Supply Southern Division”, commissioned by the Government of Germany.



5. **Results.** The economic analysis demonstrates that the proposed project is economically viable. The baseline economic return of the proposed project against the ‘without’ scenario is 18.1 percent and NPV is US\$37.3 million, including global environmental benefits, which added 3.4 percentage points and US\$8.4 million to the economic return and NPV, respectively. In total, the project will result in net GHG avoidance of 308,997 tCO₂ by 2024.

6. **Sensitivity analysis.** Sensitivity analysis has been conducted against key parameters that have a significant impact on the project’s economic rate of return. These include the average WTP and the discount rate.

- **WTP.** The electricity evacuated by the project is valued based on surveys of households and small businesses. Since actual WTP should ideally also consider industrial and commercial customers, the values used in this economic analysis are subject to high uncertainty. The switching value for the WTP (to turn NPV to zero) is US¢7.2 per kWh.

Table 1.2. Sensitivity Analysis: WTP

WTP (US¢/kWh)	NPV (US\$, millions)	ERR (%)
7.2	0	—
12.3 (-10%)	29.3	15.8
13.7	37.3	18.1
15.0 (+10%)	44.9	20.1

- **Discount rate.** The choice of discount rate is a critical assumption that has a significant impact on the NPV of a project. As a result, a sensitivity analysis has been carried on the discount rates used in this analysis. Table 1.3 shows the relationship between discount rates and NPV for the proposed project.

Table 1.3. Sensitivity Analysis: Discount Rate

Discount Rate (%)	NPV (US\$, millions)
3.3	64.9
6.6	37.3
9.9	20.6

- **Shadow price of carbon.** An updated price of carbon is provided in the World Bank’s 2017 draft Guidance Note on Shadow Price of Carbon in Economic Analysis. This note is expected to replace existing 2014 Social Value of Carbon in Project Appraisal Guidance Note. Since the project is being appraised during the transition between the two, a sensitivity analysis has been carried out to assess the impact of different carbon price in the economic viability of the project. In the 2017 Guidance Note, carbon emissions are valued at two ‘high’ and ‘low’ levels, both of them increasing at the rate of 2.25 percent per year. The result of the sensitivity analysis is provided in Table 1.4.



Table 1.4. Sensitivity Analysis: Shadow Price of Carbon

Shadow Price of Carbon in 2019 (US\$/tCO ₂)	NPV (US\$, millions)	ERR (%)
US\$34/tCO ₂ (mid-price, 2014 Guidance Note)	37.3	18.1
US\$39/tCO ₂ (low price, 2017 draft Guidance Note)	38.6	18.6
US\$78/tCO ₂ (high price, 2017 draft Guidance Note)	48.2	23.2
No carbon price	28.9	14.7

B. Financial Analysis

Financial Impact of the Ngonye Project on Zambia’s Electricity Sector

7. To assess the financial implication of the Ngonye Project on the sector, a comparative analysis has been undertaken. With the project, 28.2 MW AC (34 MWp) will come online in 2019 and operate for 25 years following the PPA. The tariff that ZESCO pays as the off-taker is US\$7.893 per kWh, based on the bidding result. The cost is not indexed to inflation and remains constant. The cost of IPPs recently contracted by ZESCO (for example, Itezhi Tezhi hydropower, Maamba coal power plant) is estimated between US\$8.7–US\$9.8 per kWh. For comparison, a cost of US\$8.7 per kWh has been applied. This tariff is also conservatively assumed to remain fixed over the full period.

8. With these assumptions, the NPV of the Ngonye Project has been assessed using a 6.6 percent discount rate. The result shows that the project will allow the sector to gain US\$6.47 million as compared to the latest contracted power purchases. If a tariff of US\$9.8 per kWh is applied, the NPV gain increases to US\$14.73 million.

ZESCO Financial Analysis

9. This section provides an assessment of ZESCO’s current and future financial performance. ZESCO is a vertically integrated electricity utility company, wholly owned by the IDC. The sole source of revenues for the project will be electricity sales to ZESCO. Hence, ZESCO’s financial viability is key to determine the risk of the project to be covered under the guarantee.

10. ZESCO’s financial performance is affected by some key factors, including:

- **Dominance of hydropower.** Over 85 percent of annual power generation comes from hydropower sources. Generation costs from hydroelectric plants¹⁷ are generally low owing to fully depreciated assets and limited operating cost. In 2015 and part of 2016, the power sector suffered significant reduction in its capacity to generate electricity due to lower than

¹⁷ Victoria Falls, Kafue Gorge Upper, and Kariba North Bank are the three largest dams built in 1938, 1972, and 1976, respectively.



expected rainfall. In 2017, the hydrology¹⁸ has improved, helping ZESCO reduce reliance on expensive emergency power imports.

- **Mining sector as the anchor customer.** Copper mining is a major pillar of the Zambian economy and constitutes over 77 percent of the country’s export. Approximately half of ZESCO’s generated power is sold to the mining sector, primarily through the Copperbelt Energy Corporation. Hence, the mining sector is by far the largest customer segment for ZESCO. Global copper price significantly affects the production of the mining sector and thus ZESCO’s sales of power to the sector. Mining firms pay ZESCO in U.S. dollars mitigating ZESCO’s exposure to currency risk.
- **Non-cost reflective tariff.** Historically, non-cost reflective tariffs have been a major factor that adversely affects ZESCO’s financial performance. In the spirit of moving the power sector to cost-reflective tariff levels, the retail tariff was increased by 50 percent in May 2017 and by an additional 25 percent in September 2017. For the mining industry, the tariff was increased to US¢84 per kWh in 2017 while there is an ongoing litigation around the 2014 electricity tariff increase (applied to mining firms). The GRZ commissioned the CoSS, the completion of which is tentatively expected in 2018. The study will provide an objective basis for tariff determination in Zambia, leading the regulator to carry out a new tariff trajectory mechanism, toward cost-reflective levels.
- **GRZ support.** The GRZ had provided significant support to maintain ZESCO’s financial health by converting onlent borrowings to equity and partially subsidizing the cost of emergency power imports. In 2017, US\$68 million of the GRZ’s financial support for emergency power imports were provided to ZESCO. The 2018 budget does not include provisions for GRZ financial support since (a) the only remaining emergency power import contract will expire by March 2018; and (b) a tariff adjustment is expected after the completion of the CoSS.

11. Table 1.5 presents a summary of ZESCO’s financial statements in recent years.

Table 1.5. Summary of ZESCO’s Financial Statements

	ZMW, millions			US\$, millions*		
	2014	2015	2016	2014	2015	2016
Income Statement						
Revenues	4,317.7	6,425.7	8,237.8	724.3	745.0	836.1
Cost of sales	(1,400.5)	(2,385.4)	(3,887.8)	(234.9)	(276.6)	(394.6)
Gross profit	2,917.2	4,040.3	4,349.6	489.4	468.4	441.4
Exchange gains	175.9	220.1	311	29.5	25.5	31.6

¹⁸ Lake levels at the Kariba Dam, which is good proxy for system hydrology level, exceeded 30 percent compared to 10 percent in early 2016.



	ZMW, millions			US\$, millions*		
	2014	2015	2016	2014	2015	2016
Interest expense	(49.6)	(50.0)	(324.4)	(8.3)	(5.8)	(32.9)
Profit before tax	572.6	19.6	(136.5)	96.1	2.3	(13.9)
Tax/tax credit	(249.4)	848.9	1,445.2	(41.8)	98.4	146.7
Profit	323.3	868.5	1,308.6	54.2	100.7	132.8
Balance Sheet						
Total assets	16,217.0	23,769.8	30,022.3	2,720.5	2,755.8	3,047.0
Current liabilities	2,718.0	4,995.9	8,006.1	456.0	579.2	812.6
Non-current liabilities	9,279.0	12,490.0	14,400.1	1,556.6	1,448.0	1,461.5
Total equity	4,221.0	6,283.5	7,616.0	708.1	728.5	773.0
Cash Flow Statement						
Cash flow from operations	1,455.0	2,626.9	1,360.3	244.1	304.6	138.1
Cash flow from investment	(3,070.0)	(4,482.9)	(4,745.9)	(515.0)	(519.7)	(481.7)
Cash flow from financing	1,786.0	2,454.7	3,014.4	299.6	284.6	305.9
Net change in cash	171.0	598.7	(371.1)	28.7	69.4	(37.66)

Note: * As original financial statements are in kwacha, they have been converted to U.S. dollar using exchange rates used in each financial statement (2014: ZMW 5.96 per US\$; 2015: ZMW 8.62 per US\$; 2016: ZMW 9.85 per US\$).

- **Revenues.** ZESCO’s electricity sales have been steadily increasing. In 2016, ZESCO’s revenues increased by 28 percent from ZMW 6.4 billion to ZMW 8.2 billion mainly due to the upward adjustment of the tariffs for mining customers. There was also an increase in the customer base by 12 percent from 740,312 in 2015 to 831,476 in 2016. Due to the 2017 tariff increase, improved hydrology and new cost-efficient generation capacities commissioned in 2016, revenues in 2017 are expected to improve.
- **Cost of sales.** Cost of sales increased significantly in 2016 due to power shortages and recourse to emergency power imports as a result of the significant reduction in electricity generation at Kariba North Bank and Kafue Gorge power stations due to low water levels. During the year, the GRZ disbursed a total of ZMW 1 billion toward emergency power purchases. Staff remuneration constituted 20–30 percent of operating expenses, and it is the largest operational expense except for emergency power imports. A World Bank study also found that ZESCO’s staffing ratio is one of the highest in power utilities in Sub-Saharan Africa.¹⁹
- **Profit.** ZESCO had consistently recorded profits in past years largely owing to depreciated low-cost hydropower generation. However, in 2016, due to increased financing costs and

¹⁹ Trimble et al. 2016. “Financial Viability of Electricity Sectors in Sub-Saharan Africa: Quasi-Fiscal Deficits and Hidden Costs.” World Bank Policy Research Working Paper 7788.



write-offs as a result of the disputed tariff by mining customers, operating losses were recorded.

12. ZESCO is experiencing financial difficulties with increases in arrears to power suppliers and expensive debt, threatening overall power sector sustainability. Arrears to power suppliers now amount to approximately US\$512 million (US\$216 million for power imports and US\$300 million due to domestic IPPs). Expensive emergency power imports were expected to be partially subsidized by the Government and, with the Government failing to provide timely subsidies, substantially contributed to the build-up of arrears. In addition, increased revenues in 2016 were largely due to the 50 percent tariff increase applied to mining customers; however, mining firms disputed the increase and did not accept to pay. Therefore, ZESCO’s receivables built up and ZESCO did not have enough cash to pay to all its suppliers, increasing its arrears.

13. ZESCO’s current level of debt is not sustainable. ZESCO has had to resort to expensive external debt to finance its operational expenses²⁰ and investments needs, which while temporarily providing relief, has had a negative impact on the utility’s creditworthiness and its ability to supply electricity from sources that were pre-planned and cost the least. This can best be illustrated by the fact that financing costs have increased 546 percent in 2016 (from ZMW 50 million in 2015 to ZMW 324 million in 2016), even though the borrowings increased by only 19 percent. Since ZESCO’s current outstanding debt increased to US\$1.5 billion (up by 25 percent from approximately US\$1.2 billion in 2016), the cost of debt service has become a more significant burden on the utility’s financial situation. Moreover, lenders’ overcollateralization of assets including account receivables²¹ to have security for the borrowings they provided has created further constraints on borrowing. Indeed, ZESCO does not have enough unencumbered assets to engage in additional borrowing. ZESCO’s difficult financial situation is reflected in a number of key ratios that are below sustainable thresholds. To address these financial difficulties, ZESCO is in the process of appointing a transaction adviser for its financial restructuring and debt refinancing.

Table 1.6. ZESCO’s Financial Indicators

	Sustainable Threshold	Actual FY16	Explanation of the Ratio
Current ratio	>1.0x	0.77x	Measures a company’s ability to pay its short-term payment obligations. A ratio of less than 1 means the company is unable to pay off its obligations if they came due at that time.
Interest cover ratio	>2.0x	0.58x	Measures a company’s ability to pay its outstanding debt. A ratio of less than 1 means that the company does not have enough earnings to make payments for interest.
Net profit margin	>5%	1.7%	Measures a company’s profitability. Clearly a negative ratio means that the company is not making any profits, and instead, it is losing money.

²⁰ ZESCO meets salary payments from short-term borrowing due to the scale of the wage bill. Ideally, the company should be able to meet its recurrent costs from its operating cash flow.

²¹ The pledged account receivables are approximately 42 percent of total mining revenue, which accounts for more than 60 percent of total revenue.



14. **Projected financial performance of ZESCO.** ZESCO’s financial performance has been forecasted based on the assumptions described in the following sections.

- **Demand.** Zambia’s power demand will continue to grow. Conservatively, demand from mining is assumed to grow at 2 percent per year from 2020. Demand from industrial and commercial users will grow at 2.0 percent to 2.5 percent per year. Demand from the residential sector will grow at 5 percent per year given the planned expansion of electricity access to households.
- **Supply forecast.** New generation capacity will be added to meet the ongoing power deficit and growing demand. Near-term additions (up to 2025) are listed in table 1.7. Given the recent improved hydrology and newly commissioned power plants,²² ZESCO will not need to rely on costly emergency power from mid-2018.²³

Table 1.7. Major Planned Additional Generation Capacity in Zambia

Commission	Plant	Fuel	Capacity	Ownership
2018	Chishimba Falls	Hydro	9	ZESCO
2018	Lusiwasi Upper	Hydro	15	ZESCO
2018	Musonda Falls	Hydro	5	ZESCO
2018	Solar (Round I)	Solar	88	IPP
2019	Solar (Round II)	Solar	250	IPP
2020	Kabompo	Diesel	34	IPP
2021	Lusiwasi Lower	Hydro	86	ZESCO
2022	Mujila	Hydro	7	ZESCO
2024	Kafue Gorge Lower	Hydro	600	IPP
2025	Kalungwishi	Hydro	210	IPP

- **Macroeconomic conditions.** In general, the Zambian kwacha depreciation increases accounting revenues for ZESCO in kwacha terms since a significant portion of ZESCO’s revenues is denominated in U.S. dollars. However, it also increases debt services obligations which are mostly denominated in U.S. dollars.
- Under the base case scenario, the assumptions described in table 1.8 are made.

Table 1.8. Base Case Assumptions

Item	Assumptions
Hydrology	Hydrology levels in 2017 year-to-date are significantly better than 2015 and 2016. The model assumes 63% capacity factor for 2017 and gradual improvement from 2017 to 2020 as the Kariba Dam Rehabilitation project is completed and is aligned with historical data.

²² Itezhi-Tezhi Hydro Power Plant (120 MW), Maamba Coal Power Plant (300 MW), and extension to the Ndola Energy Heavy Fuel Oil (HFO) plant (55 MW).

²³ Currently, ZESCO has only one emergency power contract with Karpower, which will expire in March 2018.



Item	Assumptions
Retail tariffs	Tariff increase by 50% in May 2017 and 25% in September 2017 reflected in 2017 projection. Since the timing of completion of the CoSS is uncertain, the model assumes 2018 retail tariffs to stay the same as year-end 2017 levels. Cost-reflective tariffs to be achieved over the next 5–6 years.
Mining tariffs	US¢8.4 per kWh in 2017 (according to agreement between ZESCO and all mining customers), stays the same in 2018 (same as for retail tariffs, the timing of completion of the CoSS is uncertain) and cost reflective going forward.

15. Despite the improved hydrology and increased tariffs in 2017, the sector’s financial situation remains fragile and unsustainable due to a combination of various reasons, such as lower average retail tariff, delays with increases of the mining tariff for 2018, and a quick accumulation of ZESCO’s arrears. Under the base case scenario, ZESCO faces a substantial risk of negative cash-flow in 2017–21 (approximately US\$427 million). Since cash generated from the operation is not enough to pay debt service and current liabilities, it is expected that arrears will further accumulate for the next four to five years.

Table 1.9. Base Case Results

US\$, millions	2017	2018	2019	2020	2021	2022	2023	2024
Revenues (including subsidy)	946	980	1,216	1,398	1,566	1,694	1,752	2,064
GRZ emergency power subsidy	51	8	—	—	—	—	—	—
Opex (including power purchase and imports)	(790)	(733)	(786)	(818)	(837)	(857)	(877)	(1,162)
Power purchase costs	(348)	(374)	(443)	(471)	(482)	(493)	(504)	(779)
Imports	(98)	(16)	—	—	—	—	—	—
Net cash generated*	(136)	(152)	(51)	(73)	(14)	27	86	157
Average capacity factor of ZESCO hydros	63%	67%	70%	70%	71%	71%	71%	71%
Retail tariff (US¢)	4.9	5.9	7.6	9.4	10.3	11.2	11.5	11.8
Average mining tariff (US¢)	8.4	8.4	9.7	10.1	10.5	11.2	11.5	11.8
Cost of service (US¢)	9.1	9.3	9.7	10.1	10.5	11.2	11.5	11.8
Current ratio	0.7	0.6	0.7	0.7	0.7	0.8	1.0	1.4
DSCR	0.5	0.8	1.7	2.0	2.5	2.7	2.9	3.9
Operating margin	5%	13%	28%	35%	40%	43%	42%	37%

Note: *Net cash generated include cash flows from operations, cash flows from investment, and cash flows from financing activities.

16. Sensitivity analysis has been conducted against key parameters: hydrology and tariff, that have a significant impact on ZESCO’s financials. The analysis in table 1.10 shows that speedy completion and adoption of the CoSS, which would lead to retail tariff increase, would substantially improve the financial situation.



Table 1.10. Sensitivity Analysis Results

Scenario	Total Net Cash (2017–2021), US\$, millions
Base Case	(427)
(1) 63% Average Capacity Factor of ZESCO Hydros (2017–2021)	(517)
(2) 70% Average Capacity Factor of ZESCO Hydros (2017–2021)	(322)
(3) Cost Reflective Average Mining Tariff from 2018	(379)
(4) Cost Reflective Average Retail Tariff from 2018	45
(5) 70% Average Capacity Factor of ZESCO Hydros (2017–2022)	141
Cost Reflective Average Mining Tariff from 2018	—
Cost Reflective Average Retail Tariff from 2018	—



Annex 2: IFC Anticipated Impact Measurement and Monitoring (AIMM) Rating

REPUBLIC OF ZAMBIA: Additional Financing for Zambia Scaling Solar Energy Project

Ngonye Project’s Expected Development Impact

1. Summary. The project has an AIMM rating of ‘good’, mainly driven by its market creation impact. The Ngonye Project is one of two projects selected in Round 1 of the Zambia Scaling Solar Program, which sets out the rules of engagement for subsequent procurements. In particular, it contributes to establishing a low tariff benchmark, a framework for coordination of GRZ entities, and the financial package including instruments required to mitigate off-taker risk. IFC expects that 300 MW worth of solar power projects will be procured during Round 2 of the program. Moreover, there is evidence that the successful conclusion of the first tender of the Scaling Solar Program in Zambia—the pioneer country—is influencing the design of similar programs across Sub-Saharan Africa. The Zambia Scaling Solar Energy Project also contributes to improving resilience of the power system which is currently hydropower-based and thus susceptible to hydrological risk. It also marginally improves the carbon footprint of the power sector in Zambia.

Table 2.1. Provisional AIMM Rating

Project Impact	Very Strong	G	G	E	E
	Strong	G	G	G	E
	Moderate	S	S	G	G
	Minimal	L	S	G	G
Key		Minimal	Moderate	Strong	Very Strong
E = Excellent		Market Impact			
G = Good					
S = Satisfactory					
L = Low					

Note: This table summarizes how IFC determined the provisional AIMM rating for this project. In general, the starting point for an AIMM rating sits at the intersection of the project-level assessment (vertical axis) and the market-level assessment (horizontal axis). Assessments of project-level and market-level impacts (minimal, moderate, strong, or very strong) are shaded in black, as is the corresponding intersection box representing the AIMM rating for the project: Low (L), Satisfactory (S), Good (G), or Excellent (E). Please note that the ratings matrix serves as a general guide for the overall AIMM rating. Because of the lack of granularity in the qualitative assessments, AIMM ratings are interpreted flexibly in view of country and market contexts. As implementation of the AIMM rating system proceeds during FY18, this table will evolve based on operational experience and refinements to the ex ante rating process. For example, as FY18 proceeds and the AIMM ratings process becomes more sophisticated, qualitative ratings will eventually convert to quantitative scores.

2. Project impact assessment. The project has a project-level AIMM rating of ‘moderate’. The project entails the addition of 34 MWp of power generation capacity to the electricity grid in Zambia, a marginal 1 percent increase in installed capacity. The plant would generate 61 GWh of electricity annually, a 0.5 percent increase from present average supply levels.



3. **Stakeholder impact.** IFC expects the Ngonye Project to contribute to lowering the average cost of service. The Ngonye Project's tariff, at US\$7.8 per kWh, flat for 25 years, falls below Zambia's average cost of emergency generation of US\$12.9 per kWh. Zambia's generation mix comprises mainly hydro and coal (contributing 98 percent of generation capacity) and, its cost of service, estimated at US\$9.1 per kWh, remains among the lowest in Sub-Saharan Africa. The project's immediate expected cost savings benefits primarily come from substituting more expensive sources of energy. In 2016, Zambia imported 3,408 GWh (29 percent of domestic production in the same year) to meet a large, mostly drought-induced, power deficit. IFC expects the need for emergency capacity to decrease in 2024, when the Kafue Gorge Lower hydropower plant with 600 MW of installed capacity (a 20 percent increase on current capacity) comes on stream. The Scaling Solar Program is expected to contribute an additional 376 MW of total capacity by 2024, of which 7 percent (or 1 percent of current capacity) is from the Ngonye Project. To measure progress against this impact, IFC will track the volume of power produced in GWh produced per year (see Table 2.2).

4. **Environmental impact.** IFC expects the Ngonye Project to also contribute to marginally lowering emissions, by partially displacing carbon-intensive emergency generation capacity. Zambia's installed generation capacity has a relatively low carbon footprint, given that hydropower makes up 85 percent of the generation mix. However, the emergency capacity is carbon-intensive. Emergency power imports in 2016, for example, comprised imports from Eskom (coal dominated, 38 percent), Electricidade de Moçambique (EDM) (hydro dominated, 26 percent), Karpower (HFO, 26 percent), and Aggreko (liquefied natural gas/HFO, 10 percent). The expected GHG savings are expected to last till at least 2024 when the 600 MW Kafue Gorge Lower hydroelectric plant may become operational. The Ngonye Project is expected to lead to 51,500 tCO₂ of GHG emissions savings annually through 2024. These savings are valued at between US\$1.8 million and US\$2.0 million annually.

5. **Market impact assessment.** The market-level impact is rated 'very strong' driven by the project's demonstration effect which provided a replicable model to scale up solar PV. The project will also help strengthen the resilience of the power sector by supporting a shift in the generation mix toward climate-resilient resources. To measure progress against this impact, IFC will track the volume of emissions avoided by the power plant in tons CO₂ per year (see Table 2.2).

6. The main market creation components are as follows:

- **Competitiveness - demonstration of scalability of solar PV.** Scaling Solar Zambia is the first implementation of the WBG's Scaling Solar initiative which brings together a suite of WBG services to create viable markets for grid-connected solar PV plants, coupled with support to governments and utilities to enable the competitive procurement of projects. The Ngonye Project is one of the two projects awarded concessions during Round 1 of the Scaling Solar Program in Zambia. It is a product of a market creation effort in which extensive WBG engagement in the power sector of Zambia, including IFC transaction advisory services provided to the program's implementing agency in Zambia—IDC—created investment opportunities for the private sector. The successful conclusion of Round 1 of the program in Zambia will demonstrate its viability and confirm its replicability both within Zambia (enabling implementation of Round 2) and in other countries targeted by the WBG program. IFC expects that 300 MW of additional solar capacity will be procured in Round 2 of the program in Zambia.



Moreover, there is evidence that the successful conclusion of the Round 1 tender of Scaling Solar Zambia is facilitating the WBG's engagement to implement similar programs across Sub-Saharan Africa, for example, in Madagascar, Ethiopia, and Senegal, whose programs are currently being implemented.

- **In arriving at its market assessment, IFC identified the following elements of the demonstration and replication channel through which the market impact will be delivered.**
 - The structuring of the intervention as a 'program' guarantees replication of best practices in future rounds of procurement.
 - The Ngonye Project benefits from a standardized procurement process established as part of the Scaling Solar Program. The suite of documentation, fine-tuned to reflect the GRZ, sponsors, lenders, IDA, and other stakeholders' comments in the process of implementing Round 1 projects, will be used during the planned Round 2 tender in Zambia.
 - Round 1 of the Scaling Solar Program in Zambia has demonstrated the benefits of the tendering system of procuring solar capacity in terms of expediency and price. Winning tariffs for the two Round 1 projects, at US\$6 and US\$7.8 per kWh, respectively, established a low tariff benchmark for grid-connected solar PV among countries with similar risk profiles in the region. Scaling Solar Projects were also procured at a flat tariff for 25 years without tariff escalation, demonstrating a more price-competitive model.
- **Resilience - increasing the share of climate-resilient renewable energy capacity to address seasonal deficits.** Zambia's power generation mix is heavily hydropower-dominated, which is sourced from one main river basin, making it more susceptible to hydrological risk resulting from climate change impacts. During the most recent drought, electricity production from hydropower plants significantly declined, leading to large and expensive imports, as well as frequent outages. The frequency of outages increased from an average of 5.2 per month lasting on average 2.8 hours in 2013 (World Development Indicators), to daily rolling blackouts lasting up to 8 hours at the peak of this crisis from 2015 to 2016. This underscores the need to diversify electricity generation sources to include more climate resilient ones. The Ngonye Project does exactly that, contributing renewable energy capacity that also improves the resilience of the power system. The GRZ has a long-term plan to develop 600 MW of on-grid solar power capacity, of which 76 MW were procured in Round 1 of the Scaling Solar Program and an additional 300 MW are targeted for development in Round 2.
- **While improving the resilience of the power sector to climate change, increasing the share of solar PV in the generation mix also enhances the financial resilience of the sector.** During the recent power crisis, ZESCO's import bill increased from US\$4 million in 2014 to US\$59 million in 2015, and US\$340 million in 2016 at the peak of the crisis. The large and unexpected expense resulted in ZESCO defaulting on its payment obligations, both to suppliers of emergency power and to local IPPs. If Rounds 1 and 2 of Scaling Solar are successfully implemented, this would provide Zambia with a valuable insurance against future droughts or adverse hydrology variations; even absent such crises, solar PV will help



ZESCO optimize its reservoir management approach and have additional reserve margins in the system.

7. **Results measurement.** The project’s performance indicators that will be tracked in the Development Outcome Tracking System (DOTS) are presented in table 2.2.²⁴

Table 2.2. Results Measurement

	Detailed Impact Description	Impact Indicators	Target and Year
Financial Performance	Returns to all capital providers	Annual Return on Invested Capital (ROIC)	Annual US\$ ROIC to exceed annual US\$ WACC over the life of the investment.
	Project completion	Project completion on time and within budget	Project to be completed within +/-10% of budget and with less than a 6-month delay from the scheduled commissioning date.
Economic Performance	Returns to capital providers and to society	Annual Economic Return on Invested Capital (EROIC)	Annual US\$ EROIC to exceed annual US\$ WACC over the life of the project.
	Power produced	GWh produced/year	61 GWh/year on average over the project life (25 years).
	Employees: job creation	<ul style="list-style-type: none"> • Construction jobs • Permanent operational jobs 	<ul style="list-style-type: none"> • 120 jobs created (87 local) during construction (at peak) - subject to review of the EPC contractor’s final staffing plan. • 27 incremental permanent jobs. Expected (26 local) during the project’s operations phase (starting from commercial operation date) - subject to review of the O&M contractor’s final staffing plan.
E&S Performance	Environmental sustainability	<ul style="list-style-type: none"> • Occupational injury frequency per million man-hours • Tons of CO₂ avoided • Water consumption and efficiency 	<ul style="list-style-type: none"> • The plan is to maintain zero injuries. • 51,500 tCO₂/year • Emissions avoided when operating up to at least 2024. • Estimated water consumption of 12 to 15 m³/day during construction and 10 m³/week during operations.
Private Sector Development	Demonstration effect	Emergence of IPPs in the Zambia power market. Emergence of tendering processes for PV projects in other countries in Sub-Saharan Africa	Several additional IPP developments are expected to be financed in Zambia benefiting from Scaling Solar’s Round 1 contractual framework, process and project execution as a reference point, including an anticipated Scaling Solar Round 2. Tendering process for PV projects in Senegal, Ethiopia, and Madagascar to follow.

Note: WACC = Weighted Average Cost of Capital.

²⁴ During the FY18 AIMM pilot period, IFC will continue to use DOTS; over the course of FY18, IFC hopes to refine DOTS so that it will be fully integrated with the AIMM system.



Annex 3: Summary of Indicative Terms and Conditions of the Proposed IDA Payment Guarantee

REPUBLIC OF ZAMBIA: Additional Financing for Zambia Scaling Solar Energy Project

This term sheet contains a summary of indicative terms and conditions of a proposed guarantee (Guarantee) by the International Development Association (“IDA”) for discussion purposes only and does not constitute an offer to provide a Guarantee. The provision of a Guarantee is subject, inter alia, to satisfactory appraisal by IDA of the Ngonye Project (“Project”), compliance with all applicable policies of the World Bank, including those related to environmental and social safeguards, review and acceptance of the ownership, management, financing structure, and project/transaction documentation by IDA, and the approval of the management and Executive Directors of IDA in their sole discretion. This term sheet is based on the signed versions of the agreements (Power Purchase Agreement and Government Support Agreement), and is designed to support obligations in such documents.

LETTER OF CREDIT (LC)	
LC Applicants:	The “Purchaser” under a Power Purchase Agreement (“PPA”) and the “Government” under the Government Support Agreement (“GSA”, and together with the PPA, the “Relevant Project Documents”), each entered into with the Seller.
LC Beneficiary:	The “Seller” under the Relevant Project Documents, that is Ngonye Power Company Limited.
LC Bank:	Standard Chartered Bank, a commercial bank competitively selected by the Purchaser, acceptable to IDA, LC Applicants and the LC Beneficiary, and which is an “Acceptable Bank” (as defined in PPA).
Maximum LC Amount:	The maximum amount available for draw under the LC shall be an amount consistent with the PPA requirements and acceptable to IDA and in no event shall exceed US\$2.8 million.
LC Effective Date:	A date to be agreed between the LC Applicants and LC Beneficiary (and acceptable to IDA), which is expected to be the “Effective Date” as defined in the PPA.
LC Validity Period:	18 years.
LC features:	A letter of credit substantially in the form proposed in the LC Bank competitive recruitment, issued in favor of, and acceptable to, the LC Beneficiary by the LC Bank at the request of the LC Applicants to backstop certain payment obligations of the LC Applicants under the Relevant Project Documents. Any amounts drawn by the LC Beneficiary under the LC that are repaid to the LC Bank within the LC Reimbursement Period (as defined below) would be reinstated. The obligation of the LC Applicants to repay the LC Bank amounts drawn under the LC would be guaranteed by IDA. Any amount paid by IDA to the LC Bank under the Guarantee would be deducted from the Maximum Guaranteed Amount, and thus from the Maximum LC Amount, and those amounts would not be reinstated.
Permitted Drawdown under LC:	Purchaser’s failure to make a payment pursuant to articles 12.3.3 and



	13.6.1 of the PPA when due and payable; and If the PPA is terminated, the Government’s failure to make the termination payment under the terms of the GSA, <i>provided that</i> (i) such payment is undisputed or if such payment is disputed, such dispute has been finally resolved; and (ii) such termination payment obligation is due as a result of the occurrence of certain events agreed between the LC Applicants and the LC Beneficiary (and acceptable to IDA).
LC Fees:	A fee acceptable to IDA, the LC Applicants and LC Beneficiary as determined during the LC Bank competitive procurement and payable to the LC Bank by either the LC Beneficiary or the LC Applicants. ²⁵
LC REIMBURSEMENT AND CREDIT AGREEMENT	
Borrower:	LC Applicants ²⁶
Lender:	LC Bank
LC Reimbursement Period:	Following a draw under the LC by the LC Beneficiary, LC Applicants would be obligated to repay the LC Bank the amount drawn under the LC together with accrued interest thereon within a period of twelve (12) months (“Reimbursement Period”) from the date of each draw pursuant to a Reimbursement and Credit Agreement to be concluded between LC Applicants and the LC Bank. In the event of a timely repayment, the LC will be reinstated by the amount of such repayment. In the event of a nonpayment on the due date, the LC Bank would have the right to call on the Guarantee for principal amounts plus accrued interest due by the LC Applicants under the Reimbursement and Credit Agreement.
Principal amount of the LC Bank Credit:	Amounts drawn down under the LC not to exceed the Maximum LC Amount.
Interest Rate on the LC Bank Credit:	An appropriate spread above LIBOR as determined during the LC Bank competitive procurement and acceptable to IDA.
GUARANTEE AGREEMENT	
Guarantor:	IDA
Guaranteed Beneficiary:	LC Bank
Guarantee:	IDA would backstop the obligations of the LC Applicants under the Reimbursement and Credit Agreement to the extent that said obligations result from Permitted Drawdown under the LC and the LC Applicants have failed to replenish the LC.
Maximum Guaranteed Amount:	The Maximum Guaranteed Principal plus Maximum Guaranteed Interest as below. Any amount paid by IDA to the LC Bank under the Guarantee would be deducted from the Maximum Guaranteed Amount and would not be

²⁵ Note that the PPA allows for the LC Beneficiary to pay LC Fees directly to LC Bank and charge back such LC Fees to Purchaser.

²⁶ The Government has an obligation to replenish any draws pursuant to Article 5.2 of the GSA in addition to its obligation to pay any termination amount. As such, under the Reimbursement and Credit Agreement, the Government would act as co-Borrower.



	reinstated.
Maximum Guaranteed Principal:	The Maximum LC Amount.
Maximum Guaranteed Interest:	Scheduled interest due and payable on the amounts drawn under the LC. IDA may cover compound interest but IDA will not cover penalty interest, default interest or charges of similar nature.
Maximum Guarantee Period:	LC Validity Period plus 14 months.
Exclusions, Limitation/Suspension and Termination Events:	Standard exclusion, limitation/suspension and termination events for transactions of this nature.
Substitution of Guarantee:	If IDA exercises remedies against the LC Bank under the Guarantee Agreement for reasons attributable to the LC Bank, then IDA may enter into a new Guarantee Agreement with a substitute LC Bank ²⁷ in substantially the same terms and conditions as the Guarantee Agreement and for the remaining term of the Maximum Guarantee Period.
Conditions Precedent to the Effectiveness of the Guarantee:	Usual and customary conditions for financing of this type, including but not limited to the following: <ul style="list-style-type: none"> (a) Firm commitment for sufficient financing to complete the construction of the Project, including satisfactory contribution of equity; (b) Execution, delivery and effectiveness of all Project and financing agreements, in form and substance satisfactory to IDA, including the Indemnity Agreement and the Project Agreement; (c) Delivery of all relevant host country environmental approvals required for the operation of the Project, and compliance with all applicable World Bank requirements relating to environmental and social safeguards, including the World Bank Performance Standards and Sanctionable Practices; (d) Effectiveness of all required insurance (to include IDA as an additional insured on third-party liability insurance); (e) Satisfaction of all conditions precedent under the Financing Documents, save for any condition that requires the effectiveness of the IDA Guarantee Agreement to have occurred; (f) Provision of satisfactory legal opinions; and (g) Payment in full of the Up-Front Fees (if invoiced, including IDA outside counsel expenses) and the first installment of the Guarantee Fee.
Subrogation:	If and to the extent IDA makes any payment under the Guarantee, IDA will be subrogated immediately to the extent of such unreimbursed payment to the LC Bank's rights under the Reimbursement and Credit Agreement.
Governing Law:	English law or New York Law.
INDEMNITY AGREEMENT	
Parties:	IDA and the Republic of Zambia ("Zambia").
Indemnity:	Zambia will reimburse and indemnify IDA on demand, or as IDA may

²⁷ That is, a commercial bank acceptable to IDA, LC Applicants, and the LC Beneficiary, and which is an 'Acceptable Bank' (as defined in PPA).



	otherwise direct, for all payments under the Guarantee and all losses, damages, costs and expenses incurred by IDA relating or arising from the Guarantee.
Covenants:	Usual and customary covenants included in agreements between member countries and IDA.
Remedies:	If Zambia breaches any of its obligations under the Indemnity Agreement, IDA may suspend or cancel, in whole or in part, the rights of Zambia to make withdrawals under any other loan agreement with IDA, or any IDA loan to a third party guaranteed by Zambia, and may declare the outstanding principal and interest of any such loan to be due and payable immediately. A breach by Zambia under the Indemnity Agreement will not, however, forgive any guarantee obligations of IDA under the Guarantee.
Governing Law:	The Indemnity Agreement will follow the usual legal regime and include dispute settlement provisions customary for agreements between member countries and IDA
PROJECT AGREEMENT	
Parties:	IDA and LC Beneficiary
Representations and Warranties:	The LC Beneficiary will represent, among other standard and project specific provisions, that as of the effective date of the Guarantee: (i) it is in compliance with applicable environmental laws and the applicable World Bank’s guidelines, environmental and social safeguard policies and other applicable requirements; and (ii) neither it (including its direct and indirect shareholder and any other relevant project participants), nor any of its affiliates has engaged in any Sanctionable Practice ²⁸ in connection with the Project.
Covenants:	The LC Beneficiary will covenant, among other things, that it will: <ul style="list-style-type: none"> (a) comply with applicable laws, including environmental laws, and the applicable World Bank environmental and social safeguard policies under the World Bank Performance Standards; (b) provide annual audited financial statements and other reports; (c) provide access to the project site and documentation on reasonable notice; (d) not engage in any Sanctionable Practice in connection with the Project; and (e) obtain IDA’s consent prior to agreeing to any change to any material Project related transaction document to which it is a party which would materially affect the rights or obligations of IDA under the Guarantee Agreement.
Guarantee Fees (recurring)²⁹:	75 bps per annum, payable semi-annually in advance by the LC ³⁰ Beneficiary, on any committed and outstanding IDA financial exposure under the Guarantee, that is, on the Maximum Guaranteed Principal. The

²⁸ ;Sanctionable Practices’ include corrupt, fraudulent, collusive, coercive, or obstructive practices.

²⁹FY18 pricing. All fees will be updated based on the pricing applicable at the time of approval by IDA’s board of directors.

³⁰ For the avoidance of doubt, all Guarantee fees (a) are separate from LC fees; (b) are payable by the LC beneficiary; and (c) under the PPA, are not charged back to the purchaser.



	Guarantee would lapse in the event of nonpayment of any installment of the relevant Guarantee Fee.
Upfront Fees³¹:	<ul style="list-style-type: none"> (a) An Initiation Fee of 15 bps of the Maximum LC Amount (but not less than US\$100,000) payable by the LC Beneficiary. (b) Processing Fee of 50 bps³² of the Maximum LC Amount payable by the LC Beneficiary. (c) Reimbursement of IDA outside legal counsel expenses by the LC Beneficiary.
Governing Law:	English law or New York Law.
COOPERATION AGREEMENT	
Parties:	IDA and Purchaser.
Covenants:	<p>Purchaser will covenant, among other things, that it:</p> <ul style="list-style-type: none"> (a) will comply with all its obligations under the transaction documents; (b) will obtain IDA’s consent prior to agreeing to any change to any transaction document which would materially affect the rights or obligations of IDA under the Guarantee Agreement or any other transaction document; (c) will provide certain notices to IDA; (d) will take all action necessary on its part, in accordance with and as required by the terms of the project-related agreements to which it is a party, to enable the LC Beneficiary to perform all of the LC Beneficiary’s obligations under the Project Agreement, and other relevant transaction document; and (e) will cooperate with IDA and furnish to IDA all such information related to such matters as IDA shall reasonably request; and promptly inform IDA of any condition which interferes with, or threatens to interfere with, such matters.

³¹FY18 pricing. All fees will be updated based on the pricing applicable at the time of approval by IDA’s board of directors.

³² Under exceptional circumstances, IDA may charge a higher processing fee.



Annex 4: Implementation Support Plan

REPUBLIC OF ZAMBIA: Additional Financing for Zambia Scaling Solar Energy Project

1. The Implementation Support Plan described in the table below explains how the team proposes to supervise and monitor the Zambia Scaling Solar Energy Project.

2. The expertise required for the Implementation Support Plan includes energy sector, financial, guarantee/commercial, legal guarantee, E&S PSs, power engineering, and M&E expertise. The responsibility for this support lies with the regional task team leader (TTL) and the Guarantee co-TTL with support from other experts. The main focus in terms of support during implementation is summarized in the table below.

Implementation Support Plan

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	Effectiveness, financial closure, selection of LC bank, safeguards, construction progress, political developments.	Sector Safeguards Guarantee/ Commercial Financial Legal Engineer Country team	US\$200,000	n.a.
Months 12–24	Review of progress in construction and generation by the IPPs; review of sector technical and financial performance; safeguards. Review progress of the sector and the IPPs. Review status of completion against indicators and PDO.	Sector Guarantee/ Commercial Financial Legal Safeguards Environment Social M & E	US\$100,000	n.a.
Through end of guarantee effectiveness period	Ongoing supervision and monitoring of legal covenants and risks that could lead to a possible call on any of the signed IDA guarantees.	Sector Guarantee/ Commercial Financial Legal	US\$50,000 per year, including US\$30,000 of staff cost and US\$20,000 of travel (one trip of two staff per year).	n.a.

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Team Leader	7–10 weeks per year	3 per year	To be adjusted annually depending on available supervision budget
Energy Specialist	7–10 weeks per year	Located in Zambia	
Guarantee Specialist, TTL	7–10 weeks per year	2–3 per year	
Legal Specialist	6–8 weeks per year	Depending on needs	
Financial Analyst	4–5 weeks per year	2 per year	
Power Engineer	2–3 weeks per year	1 per year	



Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Social	3–4 weeks per year	Local staff	
Environmental	2–3 weeks per year	Local staff	
Monitoring	1–2 weeks per year	1 per year	
Procurement	1–2 weeks per year	Local staff	
Financial Management	1–2 weeks per year	Local staff	

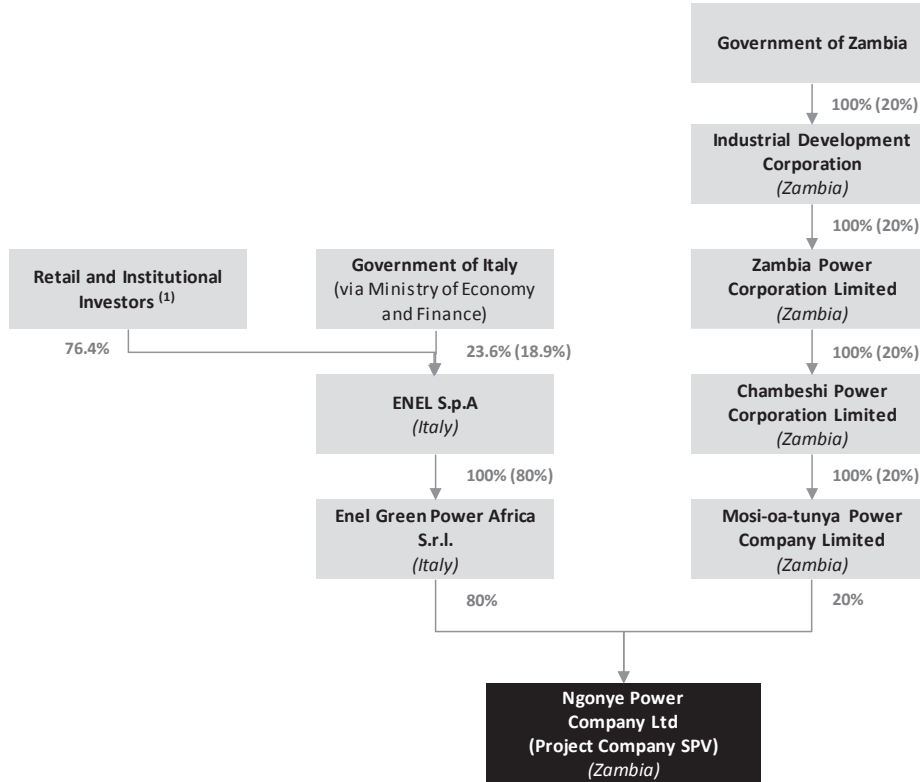


Annex 5: Ownership and Structure – Application of Offshore Financial Centers Policy

REPUBLIC OF ZAMBIA: Additional Financing for Zambia Scaling Solar Energy Project

1. Investment structure. The Project Company, Ngonye Power Company Limited, is domiciled in the Republic of Zambia. The organizational chart (figure 5.1) illustrates the ownership structure of the Project Company.

Figure 5.1. Ownership Structure of the Project Company



Note: Figures in brackets indicate indirect ownership in the Project Company. (1). Enel S.p.A. is a publicly listed company. Besides the Ministry of Economy and Finance of Italy, there are no institutional or retail investors that own more than 10 percent of the Project Company.

- (a) EGP Africa S.r.l. (incorporated in Italy) owns 80 percent of the Project Company. The entities and individuals that indirectly own more than 10 percent in the Project Company through EGP Africa S.r.l. are:
 - (i) Enel S.p.A. (incorporated in Italy), owns 100 percent of EGP Africa S.r.l., and thus indirectly owns 80 percent of the Project Company. Enel S.p.A. is a publicly listed entity with its shares traded on the Milan Stock Exchange. As a publicly listed company, Enel S.p.A. publishes its audited financial statements and annual reports and is subject to the regulatory requirements of Consob, the public supervisory authority responsible for regulating the Italian financial markets, and Borsa Italiana, the Italian stock exchange.



- (ii) The Government of Italy, via the Ministry of Economy and Finance of Italy, owns 23.6 percent of Enel S.p.A., and thus indirectly owns 18.9 percent of the Project Company.
 - (b) Mosi-oa-Tunya Power Company Limited (incorporated in the Republic of Zambia) owns 20 percent of the Project Company. The entities that indirectly own more than 10 percent in the Project Company through Mosi-oa-Tunya Power Company Limited are the following:
 - (i) Chambeshi Power Corporation Limited (incorporated in the Republic of Zambia), owns 100 percent of Mosi-oa-Tunya Power Company Limited, and thus indirectly owns 20 percent of the Project Company.
 - (ii) Zambia Power Corporation Limited (incorporated in the Republic of Zambia), owns 100 percent of Chambeshi Power Corporation Limited, and thus indirectly owns 20 percent of the Project Company. The IDC owns 100 percent of Zambia Power Corporation Limited, and thus indirectly owns 20 percent of the Project Company. The IDC is 100 percent owned by the GRZ.
2. **Integrity due diligence.** IFC has been satisfied with its integrity due diligence on all relevant persons involved in the transaction in line with IFC’s Integrity Due Diligence guidelines. An additional due diligence following the publication of the Panama Papers and Paradise Papers was completed, which did not identify any risk flags/concerns for the project.
3. **Use of intermediate jurisdictions.** There is no intermediate jurisdiction in the ownership structure of the Project Company.
4. **Taxation.** The revenues of the project will be subject to tax in Zambia. Distributions of dividends will not be subject to withholding tax by Zambia because EGP Africa S.r.l., an Italian entity, is exempt from withholding tax on dividends received from the Project Company, a Zambian entity, according to the non-double taxation treaty between Italy and Zambia.
5. **World Bank Group Policy on Tax Transparency.** This proposed investment was subject to the policy on the use of intermediate jurisdictions in WBG operations approved by the Board (IFC/R2014-0206), and was found to be acceptable.
6. Under the policy, IFC first performed its standard transactional due diligence, with emphasis on the business and tax planning rationale for the structure. Based upon the information available to IFC and the analysis conducted, IFC is satisfied that, from a transactional stand point, the structure was established for legitimate reasons.



Annex 6: Statement of IFC's Committed and Outstanding Portfolio in Zambia

REPUBLIC OF ZAMBIA: Additional Financing for Zambia Scaling Solar Energy Project

MIS

International Finance Corporation

Statement of IFC's Committed and Outstanding Portfolio

Amounts in US Dollar Millions

Accounting Date as of : 10/31/2017

Region(s): Sub-Saharan Africa

Country(s) : Zambia

Commitment Fiscal Year	Institution Short Name	LN Cmt'd - IFC	LN Repayment - IFC	ET Cmt'd - IFC	QL + QE Cmt'd - IFC	GT Cmt'd - IFC	RM Cmt'd - IFC	ALL Cmt'd - IFC	ALL Cmt'd - Part	LN Out - IFC	ET Out - IFC	QL Out
2013/ 2018/ 2011/ 2016	Access Zambia	0	0	1.27	0	0	0	1.27	0	0	1.27	
2014	Bayport Zambia	5.99	0	0	0	0	0	5.99	0	5.99	0	
1993/ 1975/ 1990	Century Pack	0	0.88	0.05	0	0	0	0.05	0	0	0	
2015	Chayton Africa	0	0	20.00	0	0	0	20.00	0	0	20.00	
1993/ 1976	DBZ	0	0	0.00	0	0	0	0.00	0	0	0	
1982/ 1993/ 1990	Ethanol Zambia	0	0	0.00	0	0	0	0.00	0	0	0	
2016	FNB Zambia	25.00	0	0	0	0	0	25.00	0	0	0	
2017	Metalco	10.00	0	0	0	0	0	10.00	0	0	0	
1993/ 1990/ 1985	Mpongwe	0	0	0.08	0	0	0	0.08	0	0	0	
2017	Woodside	4.50	0	0	0	0	0	4.50	0	0	0	
2010	ZANACO	2.50	22.50	0	0	0	0	2.50	0	2.50	0	
2010/ 2012	Zambeef	16.34	16.63	0	0	0	0	16.34	0	16.34	0	
2017	Zoona	0	0	6.00	0	0	0	6.00	0	0	6.00	
Total Portfolio		64.33	40.01	27.40	0	0	0	91.73	0	24.83	27.27	