## PROJECT INFORMATION DOCUMENT (PID)
### APPRAISAL STAGE

Report No.: PIDA753

<table>
<thead>
<tr>
<th><strong>Project Name</strong></th>
<th>Zambia Electricity Transmission and Distribution System Rehabilitation Project (P133184)</th>
</tr>
</thead>
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<tr>
<td><strong>Region</strong></td>
<td>AFRICA</td>
</tr>
<tr>
<td><strong>Country</strong></td>
<td>Zambia</td>
</tr>
<tr>
<td><strong>Sector(s)</strong></td>
<td>Transmission and Distribution of Electricity (100%)</td>
</tr>
<tr>
<td><strong>Lending Instrument</strong></td>
<td>Specific Investment Loan</td>
</tr>
<tr>
<td><strong>Project ID</strong></td>
<td>P133184</td>
</tr>
<tr>
<td><strong>Borrower(s)</strong></td>
<td>Ministry of Mines, Energy and Water</td>
</tr>
<tr>
<td><strong>Implementing Agency</strong></td>
<td>ZESCO</td>
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<tr>
<td><strong>Environmental Category</strong></td>
<td>B-Partial Assessment</td>
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<tr>
<td><strong>Date PID Prepared/Updated</strong></td>
<td>20-Mar-2013</td>
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<td><strong>Date PID Approved/Disclosed</strong></td>
<td>25-Mar-2013</td>
</tr>
<tr>
<td><strong>Estimated Date of Appraisal Completion</strong></td>
<td>28-Mar-2013</td>
</tr>
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<td><strong>Estimated Date of Board Approval</strong></td>
<td>30-May-2013</td>
</tr>
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<td><strong>Decision</strong></td>
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### I. Project Context

#### Country Context

1. Zambia is a country of about 12 million inhabitants with a per capita income of US$1160. Real Gross Domestic Product (GDP) growth averaged 5.7 percent in the last decade driven largely by the copper industry allowing Zambia to reach lower middle income status. Despite the gains, the sources and benefits of economic growth have been narrowly focused on capital-intensive industrial (mining and construction) and services sectors, which has yet to translate into lowering poverty and raising living standards. More than 60 percent of the population lives below the poverty line.

2. Growth has been driven primarily by investments in the mining sector following escalation in global commodity prices due to increasing demand for base metals. The economy grew by an average of 6 percent during 2009-2011, and is projected to continue this trend at an average of at least 5 percent per year till 2015.

3. The peaceful transfer of power following the September 2011 elections has strengthened Zambia’s democratic credentials. Zambia has benefited from two decades of democratic government with national multiparty elections. The current Government’s platform is to redistribute wealth, boost employment and wages, and tackle corruption.

4. In keeping with its election time promises the new Government has identified poverty...
reduction and job creation as its main priority. The Government has recognized that mining sector-led growth had failed to reach the masses and looks upon agriculture and tourism development as important sources of pro-poor growth and diversification. Construction and manufacturing are also identified as priority sectors and improving the business environment for development of the private sector is recognized as key.

II. Sectoral and Institutional Context

5. Lack of access to energy reduces people’s ability to meet their basic needs or to benefit effectively from basic education, health care and communication services. During the United Nations Development Programme’s 2010 Millennium Development Goals (MDGs) review, evidence began to emerge that access to sustainable energy for the poor allows income opportunities through new jobs and enterprises, improving existing jobs and livelihoods, enabling improved health and education services, and improving opportunities and quality of life, particularly for women.

6. Electricity is the second most important energy source in Zambia after wood fuel, providing 14 percent of the national energy supply. The mining industry accounts for about 50 percent of national electricity consumption followed by service industries and residential customers with 36 percent. Electricity generation is almost exclusively based on hydro (99 percent), while the balance is based on diesel. Use of new renewable sources of energy for electricity generation such as solar, wind and geothermal is currently insignificant.

7. The overall national electrification rate is about 23 percent, with 47 percent of the population in urban and peri-urban areas and only 3 percent in rural areas having access to electricity. The current supply is inadequate to meet the demand during peak hours, resulting in load shedding in most residential areas. Further expansion of mining, agriculture, manufacturing, and residential customers will require increased supply of electricity.

Policy Environment

8. The Government of Zambia has established a relatively stable policy and a regulatory framework to promote competition, efficiency, and private sector investments in the sector. The Electricity Act of 1995 abolished the statutory monopoly of ZESCO in the power sector and provided the legal framework for the introduction of new entrants. The Government also wants to maximize the potential benefits from Zambia’s participation in regional electricity trade by taking advantage of the country’s unique position at the cross-roads of the emerging Eastern and Southern African power markets.

9. The aim of Government’s National Energy Policy (NEP 2007) is to create conditions that will ensure the availability of adequate supply of energy from various sources which are dependable at the lowest economic, financial and social and environmental cost consistent with national development goals.

Sector Structure

10. The Ministry of Mines Energy and Water Development (MoMEWD) promulgates policy and provides strategic coordination of the energy sector. The Energy Regulation Board (ERB) reviews and approves tariffs. The Rural Electrification Authority (REA) is responsible for rural electrification through grid-extension and/or off-grid and mini-grid electrification.
11. ZESCO is the vertically integrated national utility which generates, transmits, distributes and supplies electricity to national and regional markets. Two other major players are the Copperbelt Energy Corporation (CEC) and the Lunsemfwa Hydro Power Company.

12. CEC is a transmission company that purchases electricity from ZESCO at high voltage and distributes it to the mining industry in the Copperbelt region. CEC also has an 80 MW Gas Turbine generation plant which is only utilized during emergencies in the mines. The Lunsemfwa Hydro Power Company is an independent power producer generating about 48 MW of hydropower that is sold to ZESCO under a Power Purchase Agreement (PPA).

Tariffs

13. Historically, electricity tariffs in Zambia have been among the lowest in Sub-Saharan Africa. Figure 1 (can be viewed in the attached Word version of the PCN) shows Zambia’s effective residential tariffs in 2008 for 100 kiloWatt-hours (kWh) compared with other African countries.

14. Due to the low tariffs, ZESCO has not been able to invest adequately in maintaining and replacing the aging overloaded segments of the transmission and distribution networks, or to invest in major new infrastructure expansions.

15. The Government launched an ambitious multi-step tariff increase to approach cost-reflective levels during 2009-2011, increasing the tariffs by an average of 87 percent. The metered residential tariffs are between $0.034 (for consumption up to 100kWh) and $0.09 (for consumption above 700 kWh). The average tariff for pre-paid meters is slightly higher at $0.062. The average commercial tariff is about $0.06 per kWh and the bulk supply tariff for major mines was also increased in 2011 (the specific tariffs vary by mine, depending on the terms of each corresponding Power Purchase Agreement). Together, these measures have led to ZESCO’s improved financial performance and its ability to contribute to the required power sector investments.

Generation

16. ZESCO has an installed generation capacity of about 1849 Megawatts (MW) which consists of 1841 MW hydro and 8 MW diesel, representing 99 percent and 1 percent of generation mix respectively. ZESCO’s main generation stations are Kafue Gorge Power Station with 990MW capacity; Kariba North Bank Power Station with 720MW, and Victoria Falls Power Station with 108MW capacity. In addition it has mini-hydro power plants with total capacity of about 23MW and diesel power plants with a total capacity of 8 MW, which serve isolated mini grids in rural areas. However, there has been a substantial reduction in actual power generation in recent years due to on-going rehabilitation work at major power stations.

17. Generation projects under preparation/implementation are: Kafue Gorge Lower (600-750 MW), It Dezei-Tezhi (120 MW), Kariba North Bank (360 MW), and Maamba Collieries (300 MW). Despite these investments significant new generation capacity will still be needed to bridge the long term demand-supply gap.

Transmission

18. The national grid is primarily supplied by hydropower stations in the southern part of the country while the major load centers are located in the north. ZESCO’s transmission infrastructure
is currently operating at full capacity in some areas of the country, and this has adversely affected the quality, security, and reliability of supply. Rehabilitation and upgrading of various segments of the transmission network are needed to address the quality and security of supply and to improve the financial viability of ZESCO.

19. The Government also sees the potential of Zambia becoming the future electricity trading hub with the interconnections of the Eastern, Central and Southern African Power Pools, which would enable Zambia to maximize benefits from participation in the regional power markets around it.

20. The recently approved Kafue Town - Muzuma - Victoria Falls Regional Transmission Line Rehabilitation project (US$100 million, of which US$60 million is provided by IDA) would enable power flows between the northern and southern countries of the Southern Africa Power Pool (SAPP), enhance power trade both through bilateral contracts and on the short-term energy market in the pool, and overall security of supply in the SAPP.

Distribution

21. The electricity distribution system consists of about 21,400 kilometers (km) of medium and low voltage lines, distributed among four operational regions (Lusaka, Copperbelt, Northern, and Southern).

22. Most of the distribution infrastructure is aged as the cables, overhead lines and switchgear in the established residential and commercial areas of the major towns in Zambia were installed in the sixties and early seventies. The network has reached its limits and frequent equipment failures are common, resulting in the deterioration of quality and reliability of supply. Poor voltage profiles and insufficient capacity are common in all areas, necessitating a comprehensive rehabilitation and upgrade of the distribution infrastructure in all these areas.

23. Lusaka is one of the largest centers of power demand in Zambia, accounting for about 40 percent of the non-mining load. The average electrical annual load growth in Lusaka has been 6 percent for the past five years.

24. The Lusaka area transmission network consists of two transmission voltage levels of 132kV and 88kV. The area is supplied by 132kV and 88kV lines from Leopards Hill substation supported by 88kV lines from Kafue Town and 132kV lines from Lusaka West substations. The suppressed maximum power demand for Lusaka as at December 2011 was approximately 450 Megavolt-Ampere (MVA).

25. The present load in Lusaka area is already close to maximum thermal capacity of the 132kV and 88kV lines and the equipment installed at the substations. Due to the poor state of distribution infrastructure system losses are at 22 percent.

26. Assessment of the Lusaka distribution infrastructure has shown that by 2015, all but three of the more than twenty 33/11kV substations will be overloaded and would require significant upgrades. The load forecasts for the area indicate that the load will more than double by 2022, far exceeding the installed capacity at these facilities.
27. The Government has recently (July 20, 2012) requested the World Bank’s support for an Electricity Transmission and Distribution Network Rehabilitation project, with a focus on the rehabilitation and upgrading of the transmission and distribution networks in order to stabilize the power supply and improve the security and reliability of supply.

III. Project Development Objectives
The objective of this project is to increase the capacity and improve the reliability of electricity transmission and distribution system in the project target areas.

IV. Project Description

Component Name
Component 1: Rehabilitation of the 132kV and 88kV Transmission Network in Lusaka Area.
Component 2: Rehabilitation of the 33kV and 11kV Distribution Network in Lusaka Area
Component 3: Technical Assistance and Project Supervision

V. Financing (in USD Million)

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<td>BORROWER/RECIPIENT</td>
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<td>International Development Association (IDA)</td>
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<td>EC European Investment Bank</td>
<td>65.00</td>
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VI. Implementation
1. All components under this project will be implemented by ZESCO. ZESCO has established a dedicated project implementation unit (PIU) for this project. The PIU will be led by a Project Manager (PM) and will manage implementation of this project. The Project Manager (PM) will report to a Project Steering Committee consisting of top management of ZESCO and representatives of the MOMEWD, which would provide oversight for the activities of the PIU and its engineering consultant to ensure smooth and efficient implementation of the project.

VII. Safeguard Policies (including public consultation)

<table>
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<th>Safeguard Policies Triggered by the Project</th>
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<tr>
<td>Environmental Assessment OP/BP 4.01</td>
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<td>Natural Habitats OP/BP 4.04</td>
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<td>Projects in Disputed Areas OP/BP 7.60</td>
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VIII. Contact point
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