

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

Report No.: PIDA291

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<b>Project Name</b>	Electricity Network Reinforcement and Expansion Project (ENREP) (P119893)
<b>Region</b>	AFRICA
<b>Country</b>	Ethiopia
<b>Sector(s)</b>	Transmission and Distribution of Electricity (75%), Other Renewable Energy (20%), General energy sector (5%)
<b>Lending Instrument</b>	Specific Investment Loan
<b>Project ID</b>	P119893
<b>Borrower(s)</b>	FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA
<b>Implementing Agency</b>	Ethiopian Electric Power Corporation, Development Bank of Ethiopia
<b>Environmental Category</b>	B-Partial Assessment
<b>Date PID Prepared</b>	04-Apr-2012
<b>Estimated Date of Appraisal Completion</b>	16-Mar-2012
<b>Estimated Date of Board Approval</b>	29-May-2012
<b>Decision</b>	

**I. Project Context**

**Country Context**

Over the past decade, the Government of Ethiopia (GOE) has been implementing a development program aimed at poverty reduction through rapid economic growth and macroeconomic stability. Ethiopia is one of the most populous (nearly 83 million people) countries in Sub-Saharan Africa. With US\$390 gross national income (GNI) per capita Ethiopia's economic strength is significantly less than the Sub-Saharan Africa average of US\$1,176. Although the country has abundant resources and good potential for development, poverty is pandemic and often linked to environmental and natural resource degradation. Approximately 30 percent of people live below the basic needs poverty line.

The country has recorded strong economic growth over the past six years mainly due to the government-led development policies emphasizing public investment, commercialization of agriculture and non-farm private sector development. After a significant draught-related contraction in FY2003, growth rebounded at an annual average of 11.2 percent for FY2004-2009 which was significantly above average of 6.3 percent of Sub-Saharan Africa. The economic growth rate has also exceeded the minimum growth target of 7 percent established in the Program for Accelerated and Sustainable Development (PASDEP) for FY2006-2010.

Ethiopia has been implementing prudent macroeconomic policies to reduce inflation and rebuild the external reserves affected by the commodity price surges in FY2008. A policy package was adopted in late 2008 that included substantial fiscal and monetary adjustments, notably the elimination of fuel subsidies and measures to protect vulnerable groups. Following these reforms, inflation declined sharply to single digits by mid-2009. However, in the last few years, inflation has been again rising sharply and stood at about 36% at the end of February 2012, aided by significant increase in international food and fuel prices.

Ethiopia's new Growth and Transformation Plan (GTP) for FY2011-2015 seeks to accelerate poverty reduction and achieve macroeconomic stability through continued economic growth (at least 11 percent real growth rate), to enhance social development and reach the Millennium Development Goals (MDGs). Although agriculture remains the engine of growth (amounting to nearly 50% of FY2011 GDP and growing at 6% annually), service sector (growing at 14% annually) and the industrial sector are expected to play an increasing role in economic development (expected to grow at over 10% annually). Consequently, large public investments in transportation and energy infrastructure are envisaged by the GTP.

As strong industrial and service sector growth is an essential part of the GOE's strategy, availability of stable energy supply is essential. Furthermore, in the GTP period, the public policy goals of the GOE related to the energy sector are to increase rural coverage and to provide access to affordable, modern, cost-effective electricity services to the population (at present, only 14% of population is connected to grid and the per-capita consumption of electricity is about 200 kWh per year). The GOE also intends to produce enough electricity to generate export earnings by participating in the regional power trade through the East Africa Power Pool (EAPP).

**II. Sectoral and Institutional Context**

**Energy Sector Achievements in the Last Decade**

Since the implementation of the last five year plan, the electricity sector in Ethiopia has been growing at an extremely rapid pace. More than 41% of rural towns and villages were connected to the grid and the number of consumers connected grew from 800,000 in 2005, to more than 2 million in 2011. With the increase in access, demand for electricity also increased. Average demand growth rate of electricity was above 15% per annum during 2005-2010 (about 21% and 25% in FY2009 and FY2010, respectively). The growth resulted in EEPSCO (Ethiopian Electric Power Corporation) facing difficulty in meeting the demand which surpassed its installed generation capacity.

To address the supply shortfall, EEPSCO undertook several short term measures. A moratorium was imposed on connecting new consumers from late 2008 to 2010 to manage the rapid increase in electricity demand. Demand side management initiatives including free distribution of about 5

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million CFL lamps to replace incandescent lamps were undertaken which reduced the peak demand by 80MW within a short period. Also, EEPSCO rented expensive thermal generation to bridge the gap in supply and rationed supply to households and industrial consumers.

In 2010, EEPSCO commissioned 3 large hydro power plants and presently has sufficient capacity to service the demand. EEPSCO commissioned Tekeze (300 MW), Gibe II (420 MW) and Beles (460 MW) power plants that increased its power generation capacity from about 850 MW to above 2000 MW. In FY2011, EEPSCO's peak demand was around 1,100 MW which was well within its capacity. EEPSCO further embarked on an aggressive demand side management by replacing existing incandescent lamps with CFLs and the rental thermal plants have been taken off from the grid.

#### Energy Sector Growth in the Next Five Years

GOE plans to become the power hub of East Africa, play a critical role in regional power trade, and increase access to electricity of its rural population. Given the renewable energy resources available in Ethiopia (about 45,000 MW Hydro potential, 10,000 MW Geothermal Potential and 5,000 MW Wind Potential) EEPSCO wants to harness this resource and play a major role in regional electricity trade. GOE also plans to support the increasing electricity demand fuelled by the industrial growth in Ethiopia and work towards a middle income country over a medium term period.

The energy sector strategy (as outlined in the GTP) calls for ambitious expansion of the sector and large scale investments. With GOE's target of achieving 11% GDP growth over the next five years, rapid promotion of industrial and service sectors as well as expanding the coverage of electricity, the domestic demand for electricity is expected to grow above 25% per year. Moreover, Ethiopia intends to become a regional power hub while implementing its green growth strategy (CRGE). To keep up with the anticipated growth in demand, EEPSCO has already been investing in additional generation capacity with several new large hydropower projects under various stages of construction (target of 8000 MW of installed capacity by 2015).

To address the challenge of low access rates, the GOE plans to scale up grid connectivity as well as expand off-grid energy programs. As described in the GTP, the target is to expand the coverage of electricity services to 75% of towns and villages in the country and to double the number of consumers connected to the grid (to 4 million) by 2015. GOE plans on expanding grid intensification programs as well as increasing the adoption of renewable energy and energy efficiency products and services in areas where grid is not present today and also to provide modern energy services to households in grid connected areas unable to afford grid connection.

Strengthening of the grid network is an essential part of the expansion strategy. Upgrading the network by reinforcing existing and adding new transmission and distribution lines to provide energy access to high energy consuming industrial areas and newly connected rural areas as well as for promoting electricity exports is another major focus of sector strategy.

The rapid increase in domestic demand and the associated investment in supply will mean that the energy sector in Ethiopia will continue to grow at a rapid pace in the coming years. Also, GOE is planning to ramp up electricity exports (to Djibouti in 2011, Sudan in 2012 and Kenya in 2017) which would further increase the demand for electricity.

#### Challenges and Opportunities

The phenomenal growth of the sector also has brought with it many significant challenges, especially for the national utility, EEPSCO, which has started to face some key capacity constraints. From a technical standpoint, the ageing electricity network (many segments of the network are over 30-40 years old) is overloaded (more than 150% loading in some cases) and is not able to efficiently service the consumers (many sections experience 35% voltage drop in transmission). The transmission and distribution lines and the sub-stations are in urgent need of repair and expansion just to keep up with the current load and essential for anticipated future demand. The upgrades are also necessary to improve the efficiency and reduce the system losses (20%) that EEPSCO currently experiences.

Promotion of off-grid energy programs is to be an essential part of the strategy to increase access. Many countries in the region have experienced success in expanding the coverage of modern energy services, especially when it comes to efficient lighting and cooking. GOE has also implemented many such programs including improved cook-stove, biogas, solar home systems, etc. However, access to finance remains a key constraint for scaling up of such interventions. While it takes several years for electricity grid to reach the rural masses, adoption of renewable energy and energy efficiency interventions is an important part of the GOE's plan of increasing access to modern energy services more rapidly.

EEPSCO itself needs to build capacity by investing in human resources and training in order to become a modern electric utility capable of handling the current and forthcoming growth in the sector. As a utility designed to handle a few hundred thousand customers, EEPSCO is today handling over two million. As a result, EEPSCO's capacity to manage such a large portfolio of projects and clients is severely lacking. It faces challenges related to procurement delays, contract administration, audit and fiduciary management, etc. There is also an urgent need to modernize the sector by upgrading the skills and strengthening the organization which includes all functions carried out in planning, executing and operating the electricity network and services.

#### Higher Level Objectives to which the Project Contributes

The high investment cost of the planned growth has created financial viability challenges for EEPSCO and will create fiscal challenges for the GOE: Under the GTP, EEPSCO has been leading an US\$ 11B energy sector expansion program, of which US\$ 3.5B has already been raised (mostly short term bonds). In the coming years, these maturing loans would amount to a large annual debt service obligation which EEPSCO will not be able to meet from its current and future operating cash flows. This shortfall will place an additional burden of about US\$ 2B on the GOE's budget in FY2012-20 (cumulatively) which is equivalent to 3-4% of the GOE's annual budget expenditure or, US\$ 0.03-0.04/kWh of additional tariff for EEPSCO (to boost its revenue). Therefore, the GOE needs to develop and implement a medium term program of revenue enhancement and debt service relief for EEPSCO.

The Country Assistance Strategy (CAS) for Ethiopia for FY2008-12 has supported the objectives of PASDEP and GTP. The present CAS aims at (i) fostering economic growth, (ii) improving access to and quality of basic services, (iii) reducing vulnerability, and (iv) fostering improved

governance. Bottom-up initiatives have been strongly encouraged as a complement to traditionally strong top-down action. The GOE's broader objective for the sector is also to modernize the sector institutions and build their overall capacity.

Based on the GOE's goals, World Bank's strategy to support the energy sector in Ethiopia includes current investments for enhancement of rural access (Energy Access Project, Additional Financing for Energy Access Project, Electricity Access and Rural Expansion Project (EAREP I and EAREP II) and regional interconnections to Sudan. These projects were aimed at supporting the GOE's goal of expanding coverage to many parts of rural Ethiopia and to increase access to modern energy services.

The Bank is also planning upcoming investments in modernization of the sector (Electricity Network Reinforcement and Expansion - ENREP P119893); further enhancement in regional interconnections to Kenya (Eastern Africa Power Pool Project - EAPP P126579); as well as investment in hydropower generation (Halele Werabesa Hydropower Project – HWHPP P125734). The proposed project, ENREP, will strengthen the existing transmission network by increasing its capacity and reliability, and will increase access to electricity by grid connection intensification and off-grid electrification.

### III. Project Development Objectives

The Development Objectives of the Electricity Network Reinforcement and Expansion Project are to improve reliability of the electricity network and to increase access to electricity services in Ethiopia.

### IV. Project Description

#### Component Name

Reinforcement of Electricity Network: Reinforcement of the electricity transmission network component includes two sub-components: (i) grid upgrade and (ii) grid extension.

Access Scale-Up: This component includes extension of distribution network and intensification of connections to the households in rural areas.

Market Development for Renewable Energy and Energy Efficient Product: will provide access to finance to promote off-grid renewable energy programs to complement the electricity grid connections.

Modernization Support: This technical assistance component includes support for key aspects of the Government's modernization program for Ethiopian Electric and Power Corporation (EEPSCO), DBE & MOWE.

### V. Financing (in USD Million)

For Loans/Credits/Others	Amount
BORROWER/RECIPIENT	50.00
International Development Association (IDA)	200.00
OPEC FUND	25.00
Total	275.00

### VI. Implementation

The project will be implemented by EEPSCO (Components 1, 2, and parts of 4), DBE (Component 3 and parts of 4) and AETPDD (parts of component 4). EEPSCO will implement this project through its institutional systems. There will be three different Project Coordinators (PCs) responsible for the three components carried out by EEPSCO. The PC responsible for Reinforcement of Electricity Network (Component 1) will report to the Transmission Project Executive Officer. This project unit will be supported by a Procurement Officer who will be trained by EEPSCO's Procurement Advisor. On safeguard related issues, the PC will be supported by EEPSCO Environment and Management Unit (EMU) which will be strengthened by the Modernization Support (Component 4) of the project.

The PC responsible for Electricity Access (Component 2) will report to the UEAP Executive Officer. The PC will receive procurement, safeguards and other administrative support as the other component explained above. The PC responsible for the Modernization Support (Component 4) will report to the EEPSCO Strategic Corporate Planning Office. The PC will be responsible to select qualified consultants as per EEPSCO requirement to provide capacity building and implementation support on Procurement, Financial Management, Safeguards Issues, Contract Management, etc. Major investment works will be carried out by experienced contracted secured through international competitive bidding. In addition, experienced project design and supervision consultants (to work with the EEPSCO team on project planning and design, social, environmental, procurement, contract management and other aspects) will be retained to assist EEPSCO with project implementation. DBE, MFIs and AETPDD will identify Project Coordinators who will ensure the capacity building activities are carried out as needed.

### VII. Safeguard Policies (including public consultation)

Safeguard Policies Triggered by the Project	Yes	No
Environmental Assessment OP/BP 4.01	X	
Natural Habitats OP/BP 4.04		X
Forests OP/BP 4.36		X
Pest Management OP 4.09		X
Physical Cultural Resources OP/BP 4.11	X	
Indigenous Peoples OP/BP 4.10		X
Involuntary Resettlement OP/BP 4.12	X	
Safety of Dams OP/BP 4.37		X

Projects on International Waterways OP/BP 7.50		X
Projects in Disputed Areas OP/BP 7.60		X

### VIII. Contact point

#### World Bank

Contact: Raihan Elahi  
 Title: Senior Energy Specialist  
 Tel: 473-4401  
 Email: relahi@worldbank.org

#### Borrower/Client/Recipient

Name: FEDERAL DEMOCRATIC REPUBLIC OF ETHIOPIA  
 Contact:  
 Title:  
 Tel: 251-11-156-002  
 Email:

#### Implementing Agencies

Name: Ethiopian Electric Power Corporation  
 Contact: Ato Miheret Dibebe  
 Title: chief Executive Officer  
 Tel: (251-11) 156-0041  
 Email: miheretdebebe@yahoo.com

Name: Development Bank of Ethiopia  
 Contact: Yemenzwork Girefie  
 Title:  
 Tel:  
 Email:

### IX. For more information contact:

The InfoShop  
 The World Bank  
 1818 H Street, NW  
 Washington, D.C. 20433  
 Telephone: (202) 458-4500  
 Fax: (202) 522-1500  
 Web: <http://www.worldbank.org/infoshop>

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