ADB

# Report and Recommendation of the President to the Board of Directors

Project Number: 46390
November 2013

# Proposed Loan
# Republic of the Union of Myanmar: Power Distribution Improvement Project

Asian Development Bank

**CURRENCY EQUIVALENTS**
(as of 30 October 2013)

| | | |
|---|---|---|
| Currency unit | = | kyat (MK) |
| MK1.00 | = | $0.001029 |
| $1.00 | = | MK971.095 |

**ABBREVIATIONS**

| | | |
|---|---|---|
| ADB | – | Asian Development Bank |
| ESE | – | Electricity Supply Enterprise |
| JICA | – | Japan International Cooperation Agency |
| kV | – | kilovolt |
| kWh | – | kilowatt-hour |
| MOEP | – | Ministry of Electric Power |
| MW | – | megawatt |
| YESB | – | Yangon City Electricity Supply Board |

**NOTE**

(i) The fiscal year of the Government of Myanmar ends on 31 March.
(ii) In this report, "$" refers to US dollars.

| | |
|---|---|
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# PROJECT AT A GLANCE

1. **Project Name**: Power Distribution Improvement Project 2. Project Number: 46390-003

3. **Country:** Republic of the Union Of Myanmar 4. **Department/Division:** Southeast Asia Department/Energy Division

5. Sector Classification:

| Sectors | Primary | Subsectors |
|---|---|---|
| Energy | √ | Electricity transmission and distribution |

6.Thematic Classification:

| Themes | Primary | Subthemes |
|---|---|---|
| Economic growth | √ | Widening access to markets and economic opportunities |
| Environmental sustainability | | Eco-efficiency |
| Capacity development | | Organizational development |

6a. Climate Change Impact:

| | |
|---|---|
| Adaptation | Low |
| Mitigation | High |

6b. Gender Mainstreaming:

| | |
|---|---|
| Effective gender mainstreaming (EGM) | |
| Gender equity theme (GEN) | |
| Some gender elements (SGE) | |
| No gender elements (NGE) | √ |

7. Targeting Classification:

| | Targeted Intervention | | |
|---|---|---|---|
| General Intervention | Geographic dimensions of inclusive growth | Millennium development goals | Income poverty at household level |
| √ | | | |

8. Location Impact:

| | |
|---|---|
| Rural | High |
| Urban | High |

9. Project Risk Categorization: Low

10. Safeguard Categorization:

| | |
|---|---|
| Environment | B |
| Involuntary resettlement | C |
| Indigenous peoples | C |

11. ADB Financing:

| **Sovereign/Nonsovereign** | **Modality** | **Source** | **Amount ($ million)** |
|---|---|---|---|
| Sovereign | Project Loan | Asian Development Fund | 60.0 |
| Total | | | 60.0 |

12. Cofinancing:

No cofinancing available.

13. Counterpart Financing:

| Source | Amount ($ million) |
|---|---|
| Government | 13.7 |
| Total | 13.7 |

14. Aid Effectiveness:

No Aid Effectiveness available.

# I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Republic of the Union of Myanmar for the Power Distribution Improvement Project.[1]

2. The project will rehabilitate the distribution network in five townships in Yangon region (Hlaingthaya, Insein, Kamayut, Mayangone, and Mingaladon), four districts in Mandalay region (Kyaukse, Meikhtila, Myingyen, and Yameethin), five districts in Sagaing region (Kalay, Katha, Monywa, Sagaing, and Shwebo), and two townships in Magway region (Aungland and Magway). These areas were selected in consultation with the Ministry of Electric Power (MOEP), Yangon City Electricity Supply Board (YESB), and Electricity Supply Enterprise (ESE). The project will help reduce system losses and subsequently increase the electricity supply to urban and rural consumers to support inclusive and sustainable economic development.

# II. THE PROJECT

## A. Rationale

3. **Strengthening power supply capacity is critical for reducing poverty** and enhancing the medium- and long-term development prospects of Myanmar. Persistent power brownouts during the dry season adversely impact economic and social activities. Electrification is urgently required; without it large areas of the country will be severely hampered in their efforts to advance economically. Basic and socioeconomic needs also depend on electrification, without which, health, education, and other essential services will inevitably suffer. About 68% of available electricity is used in Yangon (46%) and Mandalay (22%) regions (the country has 14 regions and states).

4. **Low national electricity coverage.** Although electricity consumption in Myanmar has doubled during the last 10 years, total electricity consumption in 2012 was 8,434 gigawatt-hours. With a population of about 60 million, Myanmar's per capita electricity consumption was only 140 kilowatt-hours (kWh) per year—the lowest among the 10 Association of Southeast Asian Nations member countries. The low consumption is due to lack of industrial development, lack of investment, and poor electrification ratio. The country's average electrification ratio increased from about 16% in 2006 to 28% in 2012.[2] Yangon City has the highest ratio (72%), followed by Nay Pyi Taw (65%), Kayah (42%), and Mandalay (35%). The remaining rural areas have electrification ratios averaging about 21%.[3]

5. **High distribution losses.** As of December 2012, total system installed power generation capacity was 3,495 megawatts (MW), comprising 2,660 MW (76.1%) hydropower, 715 MW (20.5%) gas-fired, and 120 MW (3.4%) coal-fired.[4] Due to scheduled maintenance and various limitations of operations at several power plants, the actual firm capacity as of December 2012 was 1,957 MW. Although the installed capacity exceeds the 2012 peak load of 1,796 MW, during the dry season hydropower plants cannot generate to full capacity due to lack of water. Hence, the country's power grid is experiencing of up to 400 MW–500 MW of load shedding during the dry season. The transmission lines and transformers have limited capacity.

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[1] The design and monitoring framework is in Appendix 1.

[2] The average electrification ratio is defined as the number of electrified households connected to the grid over the total number of households.

[3] The areas with the lowest electrification ratio are Yakhine (6%), Tanninthary (9%), and Ayeyarwaddy (10%).

[4] The country has 32 mini-hydropower plants with a combined generating capacity of 33.3 MW for the off-grid power supply.

The network also has high transmission and distribution losses. Technical and nontechnical losses of the distribution system were as high as 23% in 2003 and decreasing to 18.2% in 2012.[5] Therefore, improvement of the distribution network is urgently needed.

6. **Sector governance and institutions.** The regulatory framework for power includes the Electricity Act of 1948 (as amended in 1967), the Myanmar Electricity Law (1984), and the Electricity Rules (1985).[6] MOEP is responsible for the power subsector.[7] Within MOEP, Myanmar Electric Power Enterprise is responsible for the development and implementation of the transmission network, covering the voltages of 66 kilovolts (kV), 132 kV, and 230 kV. Two distribution enterprises operate the distribution systems in the country—YESB and ESE.[8] YESB is responsible for the supply of electricity to consumers in Yangon City[9] and ESE for the rest of the country comprising 13 states and regions, including off-grid generation and distribution.[10] Operation and maintenance capacity of the two distribution enterprises is adequate, but due to limited availability of parts and manual operation of distribution systems, performance of the distribution systems is poor.

7. **Low electricity tariffs.** From January 2012, the electricity tariffs was MK35/kWh for general purpose (households), street lighting, and government offices; and MK75/kWh for domestic power, and small and bulk power.[11] The government recently announced the increase in electricity tariff to become effective from 1 April 2014: MK35/kWh for households (until 100 kWh) and MK50/kWh (for 101 kWh and above); MK100/kWh for industry, enterprise, and lumpsum (until 5,000 kWh) and MK150/kWh for industry, enterprise, and lumpsum (for 5,001 kWh and above); MK50/kWh for government offices; and MK100/kWh for industrial use of government departments. Off-grid consumer tariffs vary depending on the cost of generation by diesel or other means (e.g., solar, mini-hydropower) and may range from MK100/kWh to MK300/kWh.

8. **Priority areas for future investments.** Significant investments are needed to (i) improve and upgrade the distribution systems, especially in Yangon and Mandalay regions; (ii) address the current shortage of power generation through rehabilitation and new additions; (iii) reinforce the transmission grid and associated substations; and (iv) extend transmission and distribution networks to connect more consumers, particularly in rural areas. A consolidated development and investment plan for the power subsector is not available. The preparation of a long-term power master plan commenced in July 2013, with assistance from the Japan International Cooperation Agency (JICA); it is expected to be completed by June 2014.

9. **ADB assistance.** Up to 1987, ADB provided five loans totaling $31.6 million and three technical assistance (TA) projects totaling $1.27 million for the power subsector. Since 1987, no

[5] Estimated at technical loss of 60% and nontechnical loss of 40%.
[6] The recently drafted revised electricity law is now undergoing interministerial consultations for promulgation.
[7] On 5 September 2012, the Ministry of Electric Power No. 1 (MOEP1) and the Ministry of Electric Power No. 2 (MOEP2) were merged into the single Ministry of Electric Power (MOEP). MOEP1 was responsible for developing, implementing, operating, and maintaining all large hydropower and coal power thermal plants. MOEP2 was responsible for (i) developing, operating, and maintaining the transmission network and distribution system; (ii) operating and maintaining gas-fired thermal plants; and (iii) planning, implementing, and operating mini-hydropower plants.
[8] Distribution systems comprise lower voltages—33 kV, 11 kV, 6.6 kV, and 0.4 kV.
[9] Formed on 1 April 2006 by The Board of Yangon City Electric Power Supply Law (Law No.6/2005).
[10] Formed on 15 May 2006 under the Ministry of Electric Power No. 2, it has been functioning as one of the departments of MOEP No. 2.
[11] The tariff for foreigners is $0.12/kWh. Originally, MOEP proposed the electricity tariffs of MK50/kWh for general purpose and MK100/kWh for domestic power in January 2012 for Cabinet approval.

loans and TA were provided. Until reengagement in March 2012, ADB obtained limited information on the power subsector through the Greater Mekong Subregion Economic Cooperation Program. The Myanmar Energy Sector Initial Assessment (October 2012) recognizes that ADB should resume providing assistance to the power subsector to enhance reliability by rehabilitating and expanding transmission and distribution networks.[12] The New Energy Architecture: Myanmar defines the enabling environment for achieving the long-term objectives of economic growth and development, energy access and security, and environmental sustainability.[13] Since reengagement, ADB has provided a total of about $4.7 million of TA to enhance capacity, strengthen planning, enhance the legal and regulatory framework, and prepare power projects. To enhance MOEP capacity, ADB assistance includes (i) a power advisor to MOEP; [14] (ii) international and national experts for preparing a transmission and distribution grid code, and electric standards and specifications; [15] (iii) preparation of a financial management assessment of four enterprises within MOEP;[16] and (iv) formulation of proper safeguard requirements and procedures.[17] Also, to strengthen the legal framework, ADB provided assistance for drafting the revised electricity law and subsequent electricity regulation, and introducing the regulatory authority to enhance transparency and attract private sector participation.[18] In addition, project preparatory TA conducted a feasibility study for transmission expansion.[19] The project is included in the country operations business plan for Myanmar and is in line with ADB's interim country partnership strategy for Myanmar for 2012–2014, which emphasizes the need to support power infrastructure. [20]

10. **Development coordination.** ADB, JICA, and the World Bank have closely coordinated their assistance for the power subsector with MOEP following reengagement.[21] They have agreed that (i) ADB will undertake rehabilitation of distribution networks in Yangon, Mandalay, Sagaing, and Magway regions; (ii) the World Bank will carry out rehabilitation of a 108 MW gas-fired plant at Thaton;[22] and (iii) JICA will undertake rehabilitation of gas-fired plants within Yangon, a hydropower plant, and distribution networks in other townships in Yangon.[23]

## B. Impact and Outcome

11. The impact will be reduced power distribution loss and improved energy efficiency. The outcome will be improved infrastructure to provide reliable and sustainable electricity to the selected townships and districts.

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[12] ADB. 2012. *Myanmar Energy Sector Initial Assessment.* Manila.
[13] Accenture, ADB, World Economic Forum. 2013. *New Energy Architecture: Myanmar*. Geneva.
[14] ADB. 2013. *Technical Assistance to the Republic of the Union of Myanmar for Capacity Development and Institutional Support*. Manila (TA 8244-MYA).
[15] ADB. 2012. *Technical Assistance to the Republic of the Union of Myanmar for Capacity Building for Project Identification.* Manila (TA 8251-MYA).
[16] ADB. 2012. *Technical Assistance to the Republic of the Union of Myanmar for Financial Management Assessment of Energy Sector.* Manila (TA 8216-MYA).
[17] ADB. 2010. *Technical Assistance for Strengthening and Use of Country Safeguard Systems.* Manila (TA 7566-REG, subproject: Capacity Building for Implementing Environment and Social Safeguards in Myanmar).
[18] ADB. 2013. *Technical Assistance to the Republic of the Union of Myanmar for Enhancing the Power Sector's Legal and Regulatory Framework*. Manila (TA 8469-MYA).
[19] ADB. 2013. *Technical Assistance to the Republic of the Union of Myanmar for Preparing the Power Transmission and Distribution Improvement Project.* Manila (TA 8342-MYA).
[20] ADB. 2012. *Interim Country Partnership Strategy: Myanmar, 2012–2014.* Manila.
[21] Development Coordination (accessible from the list of linked documents in Appendix 2).
[22] The World Bank approved a $130 million loan in September 2013.
[23] The first meeting of the electric power working group was held in MOEP on 23 May 2013. JICA and ADB are the lead development partners; other development partners include the Netherlands, Norway, the United Kingdom, and the World Bank.

## C. Outputs

12. The project outputs will be (i) rehabilitated distribution network in five townships in Yangon region, (ii) rehabilitated distribution network in four districts in Mandalay region, (iii) rehabilitated distribution network in five districts in Sagaing region, and (iv) rehabilitated distribution network in two townships in Magway region. For each project region, support to capacity building will be provided to enhance staff capability in MOEP, YESB, and ESE on rehabilitation and operation of power distribution system, procurement, and financial management during implementation. The rehabilitation works include (i) upgrading existing 66/11 kV and 33/11 kV substations, (ii) replacing existing 33 kV and 11 kV distribution lines, (iii) replacing existing 11/0.4 kV transformers, (iv) replacing existing bare low voltage distribution lines with more efficient aerial-bundled conductor distribution lines, and (v) replacing existing revenue meters with digital revenue meters.

## D. Investment and Financing Plans

13. The project is estimated to cost $73.7 million (Table 1).

**Table 1: Project Investment Plan**
($ million)

| Item | | | Amount[a] |
|---|---|---|---|
| **A.** | **Base Cost**[b] | | |
| | 1. | Rehabilitation of distribution network in Yangon | 30.1 |
| | 2. | Rehabilitation of distribution network in Mandalay | 15.9 |
| | 3. | Rehabilitation of distribution network in Magway | 9.1 |
| | 4. | Rehabilitation of distribution network in Sagaing | 8.1 |
| | | **Subtotal (A)** | **63.2** |
| **B.** | **Contingencies**[c] | | **9.5** |
| | 1. | Physical | 6.3 |
| | 2. | Price | 3.2 |
| **C.** | **Interest During Implementation**[d] | | **1.0** |
| | | **Total (A+B+C)** | **73.7** |

[a] Includes taxes and duties of $3.1 million equivalent to be financed by the government.
[b] In mid-2013 prices.
[c] Physical contingencies computed at the rate of 10%. Price contingencies computed using inflation rates of 5.1% for 2014 and 2015, and 5.0% for 2016 on local currency costs; and 2.2% for 2014, 1.9% for 2015, and 1.8% for 2016 on foreign exchange costs. The exchange rate was calculated on the basis of purchasing power parity, which assumes that the annual change in exchange rate is proportional to the ratio of local and foreign inflation indexes.
[d] Interest during implementation calculated at 1%.
Source: Asian Development Bank estimates.

14. The government has requested a loan in various currencies equivalent to SDR38,879,000 from ADB's Special Funds resources to help finance the project. The loan will have a 32-year term, including a grace period of 8 years, an interest rate of 1.0% per annum during the grace period and 1.5% per annum thereafter, and such other terms and conditions set forth in the draft loan agreement. The financing plan is in Table 2.

**Table 2: Financing Plan**

| **Source** | **Amount** ($ million) | **Share of Total** (%) |
|---|---|---|
| Asian Development Bank[a] | | |
| Special Funds resources (loan) | 60.0 | 81.4 |
| Government | 13.7 | 18.6 |
| **Total** | **73.7** | **100.0** |

[a] The Asian Development Bank will finance the interest during implementation and the local transportation and insurance costs for materials and equipment to be procured with Asian Development Bank financing.
Source: Asian Development Bank estimates.

## E. Implementation Arrangements

15. MOEP will be the executing agency. It will be responsible for overall project implementation and management, and a project management unit will be established in each of YESB and ESE. Three project implementation units will be established in three project areas within ESE. To ensure (i) implementation of the YESB and ESE material recovery plans for substituted equipment and materials, and (ii) monitoring of initial project performance and outcome, a monitoring period of 1.5 years is provided. This will help collect detailed information of initial project operations to support the preparation of subsequent ADB interventions in distribution systems. The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual.[24]

**Table 3: Implementation Arrangements**

| **Aspects** | **Arrangements** | | |
|---|---|---|---|
| Implementation period | January 2014–December 2016 (36 months) | | |
| Estimated completion date | 31 December 2018 (loan account closing date) | | |
| Management | | | |
| (i) Executing agency | MOEP | | |
| (ii) Key implementing agencies | MOEP, YESB, and ESE | | |
| (iii) Project management unit and project implementation units | A PMU will be established in each of YESB and ESE, and will be responsible for day-to-day implementation and preparation of progress reports, ensure that financial and reporting requirements are met, and ensure ADB procurement procedures are followed with full coordination with project implementation units for the three project areas in ESE: Mandalay, Sagaing, and Magway regions. Each PMU will comprise three full-time counterpart staff, supported by the project implementation consultants. | | |
| Procurement | International competitive bidding | 6 contracts | $ 48.271 million |
| Consulting services | QCBS (firm) | 214 person-months | $ 3.446 million |
| Advance contracting | Preparation of bidding documents to procure materials and equipment, and recruitment of the project implementation consultant | | |
| Disbursement | The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed upon by the government and ADB. | | |

ADB = Asian Development Bank, ESE = Electricity Supply Enterprise, MOEP = Ministry of Electric Power, PMU = project management unit, QCBS = quality- and cost-based selection, YESB = Yangon City Electricity Supply Board.
Source: Asian Development Bank estimates.

[24] Project Administration Manual (accessible from the list of linked documents in Appendix 2).

### 1. Procurement

16. ADB has approved advance contracting for procurement of goods and consulting services. This will cover bidding and bid evaluation up to the stage of ADB approval of MOEP's recommendation for award of contract before the effective date of the draft loan agreement. The preparation of the bid documents has been undertaken under TA for Preparing the Power Transmission and Distribution Improvement Project (footnote 19). The government, MOEP, YESB, and ESE have been advised that approval of advance contracting for the procurement of goods and recruitment of the project implementation consultants does not commit ADB to finance the proposed loan and that ADB financing will depend on the government's compliance with all aspects of ADB procedural requirements, including compliance with the relevant provisions of the draft loan agreement and ADB's Procurement Guidelines (2013, as amended from time to time).

17. The project will procure six procurement packages with international competitive bidding using the single-stage, one-envelope method under the ADB loan. The government will finance procurement of concrete poles using counterpart funds and follow its procurement guidelines. YESB and ESE will undertake rehabilitation, replacement, and installation works, including commissioning. Details are provided in the project administration manual (footnote 24).

### 2. Implementation Consultants

18. A total of 214 person-months of consulting services (64 person-months of international and 150 person-months of national) are required to facilitate project management and implementation, and strengthen MOEP's institutional and operating capacity. A consulting firm will be engaged using the quality- and cost-based selection method with a 90:10 ratio and full technical proposal in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). The detailed terms of reference for the consultants are in the project administration manual (footnote 24).

## III. DUE DILIGENCE

### A. Technical

19. One benefit of the project will be the introduction of international practices and techniques for modern power distribution systems to Myanmar. This will include (i) aerial-bundled conductors, fittings, and insulation-piercing connectors for low-voltage distribution to replace the existing bare open wire system; (ii) use of connectors to replace all existing hook and twisted-wire connections, which incur high losses and result in flickering voltages in homes; (iii) use of molded-case circuit breakers to protect low voltage circuits from short-circuit faults and overloading of distribution transformers to replace the existing horn-gap practice; (iv) use of dropout fuses on the primary 33/0.4 kV and 11/0.4 kV distribution transformers to replace the existing fuse wire practice; and (v) use of digital revenue meters mounted on poles to replace existing electromechanical types, with remote hand-held reading to eliminate reading errors. The introduction of n-1 criteria[25] into substation design will ensure an improvement in reliability and quality of electricity delivered to customers.[26]

[25] This is the ability of the distribution system to lose a linkage without causing an overload failure elsewhere.
[26] The installation of Supervisory Control and Data Acquisition for the distribution system was reviewed. It is to be considered after completion of construction of central dispatch centers for the transmission system.

20. Domestic manufacturing capacity to provide concrete poles was assessed and discussed extensively with MOEP, YESB, and ESE. The designs are all the same and conform to MOEP standard, with pre-stressing, reinforcing cages, and concrete mix specified. Concrete poles will be procured under local bidding procedures in three regional lots to be financed by the government. The project implementation consultants will ensure the quality of concrete poles meets the project requirements.

## B. Economic and Financial

21. **Economic analysis.** The economic viability of the project was examined by comparing the societal costs and benefits of the with-project scenario with the without-project scenario.[27] Costs to society include the costs of (i) equipment and installation, (ii) engineering and consulting services, and (iii) safeguard measures. The project costs take into account physical contingencies, but exclude price contingences, taxes, and duties. The project will reduce distribution losses by 4 percentage points, from 18.2% to 14.2%. For the base year 2013 when electricity sales in the project areas are 1,930 gigawatt-hours, this loss reduction is equivalent to 109 gigawatt-hours. This is the economic benefit in physical terms compared with the without-project scenario. As electricity consumption increases, electricity savings from the project will grow (up to 189 gigawatt-hours in 2017). Without the project, YESB and ESE would lose these electricity savings.

22. In the without-project case, most large industrial and business enterprises have to use diesel generators as backup electricity sources. Small business enterprises and wealthy households in cities could also purchase small portable generators. For poor households in cities and for households and small businesses in rural areas, power shortages usually mean they are left without electricity. Thus, the economic benefit of the project is a sum of the benefits resulting from not having to run backup diesel generators and/or not having to suffer from power brownouts. Applying economic values specifically prepared for the project areas, the analysis demonstrates that the project is economically robust under various sensitivity conditions. The project yields an economic internal rate of return of 35% and an economic net present value of $216.8 million at a discount rate of 12%. Given that power supply in Myanmar currently does not meet the demand and the growth rate of consumption is high, the value of investing in loss reduction is quite high.

23. **Financial analysis.** The project's financial viability was determined by performing a cash flow analysis of projected future revenues and cost streams from the project.[28] The weighted average cost of capital, which measures the project's cost of funds, is determined based on the source and cost of financing. The project is considered financially viable since the financial internal rate of return of 8.8% exceeds the weighted average cost of capital of 1.4%, and the financial net present value is $86.7 million. Sensitivity analysis was conducted to establish the robustness of the project's financial internal rate of return to changes in various parameters: (i) increase in capital costs, (ii) decrease in revenues, and (iii) delay in project implementation. The financial internal rate of return remains greater than the weighted average cost of capital and the financial net present value remains positive for all scenarios. The project remains viable under various combinations of the scenarios indicating it is financially robust.

[27] Economic Analysis (accessible from the list of linked documents in Appendix 2).
[28] Financial Analysis (accessible from the list of linked documents in Appendix 2).

## C. Governance

24. A financial management assessment of Myanmar's power system agencies was conducted under the Financial Management Assessment of Energy Sector TA project (footnote 16). YESB and ESE are preparing financial statements based on accrual basis, and according to the Office of the Auditor General, both institutions follow the International Public Sector Accounting Standards. However, they are using accounting manuals issued in the 1960s, which are in urgent need of updating to bring them in line with international best practices.[29] While YESB and ESE staff are qualified, they lack adequate knowledge of ADB financial management policies and procedures. To enhance awareness, ADB staff will conduct training sessions in early 2014. The project team has had no access to YESB and ESE financial statements; they based the financial analysis and assessment on available information. MOEP and the Office of the Auditor General have promised to provide ADB with the audited financial statements of YESB and ESE during project implementation.

25. The government is committed to promoting good governance and addressing corruption. The Anticorruption Commission was formed in January 2013, and the Anticorruption Law was promulgated in July 2013. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and MOEP. To ensure that procured goods are used only for the project, project implementation unit staff will verify the delivery of all goods, and maintain an asset register for each project area. The specific policy requirements and supplementary measures are described in the project administration manual (footnote 24). ADB will organize special training for MOEP, YESB, and ESE staff covering all aspects of project implementation and ADB procedures, including procedures for implementation, procurement, use of consultants, disbursement, reporting, monitoring, and prevention of fraud and corruption.

## D. Poverty and Social

26. The project is to improve the supply of reliable electricity from indigenous sources in the country. The population will benefit from improved access to electricity to support their economic activities.

27. Lack of transmission and distribution infrastructure has been the largest constraint in accessing electricity. About 480,000 households from Yangon region (Hlaingthaya, Insein, Kamayut, Mayangone, and Mingaladon townships), Mandalay region (Kyaukse, Meikhtila, Myingyen, and Yameethin districts), Sagaing region (Kalay, Katha, Monywa, Sagaing, and Shwebo districts), and Magway region (Aunglan and Magway townships) will benefit from reliable supply and improved access to electricity to support their daily activities, including economic activities. By increasing the supply of electricity through loss reduction, the project will provide increased opportunities for large industries and small and medium-sized enterprises to expand their services, improve living conditions for individuals and households, and improve conditions for community facilities (e.g., clinics, schools) in the area and thus contribute to economic development and poverty reduction.[30]

## E. Safeguards

28. The project is in category B for environment, C for involuntary resettlement, and C for indigenous people in accordance with ADB's Safeguard Policy Statement (2009). The project

[29] Assistance for computerizing the billing system has been reviewed and is recommended to be included in subsequent ADB interventions with detailed assessment.
[30] Summary Poverty Reduction and Social Strategy (accessible from the list of linked documents in Appendix 2).

involves rehabilitation and replacement of the distribution system in several townships throughout Myanmar (Yangon, Mandalay, Magway, and Sagaing regions). This has the potential to generate adverse impacts for the environment and the community in the project areas, such as during replacement of the wooden poles with concrete poles, and installation of aerial-bundled conductors along the existing routes. However, the project will not result in any physical or economic displacement, and will not affect any indigenous people. An initial environmental examination has been prepared with an environmental management plan, including budget and responsibilities for mitigating measures and monitoring during installation and operation phases and a clear structure for a grievance redress mechanism. The project will provide occupational and community health and safety training and capacity building on implementation of the environmental management plan for MOEP, YESB, and ESE staff. Adequate public consultation with concerned stakeholders is included on environment-related impacts and mitigating measures.

## F. Risks and Mitigating Measures

29. As this is the first ADB power project since reengagement with Myanmar, ADB has no experience working with MOEP, YESB, and ESE. The aggregate benefits and impacts are expected to outweigh the costs. The major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.[31]

**Table 4: Summary of Risks and Mitigating Measures**

| Risks | Mitigating Measures |
|---|---|
| Weak public financial management | A financial management assessment on Myanmar's power sector agencies was conducted and necessary capacity building for financial management will be provided in early 2014. To enhance accountability, the project implementation consultants will help the executing agency prepare financial statements in accordance with Asian Development Bank (ADB) guidelines and procedures. |
| Delay in the effectiveness of loan agreement as the first project loan | Project readiness has been ensured in compliance with government requirements and criteria, and a sample of existing loan agreements was provided in advance for familiarization. |
| Implementation delays due to lack of familiarity with ADB guidelines and procedures on procurement, recruitment of consultants, and disbursements | Project preparatory technical assistance for the Power Transmission and Distribution Improvement Project has undertaken the advance contracting for procurement and recruitment of project implementation consultants.<br>Necessary capacity building for the procurement, engagement of consultants, disbursements, and financial management will be provided. The project implementation consultants will help MOEP prepare reports following ADB guidelines and procedures.<br>The number of procurement packages was decreased to six for ICB (financed by ADB, with different delivery schedules for four project areas) to mitigate risks of delay in procurement and to improve transparency.<br>All disbursements will be made to suppliers and consultants through direct payment by ADB with no imprest account to eliminate exposure to weak banking systems in Myanmar. |

ADB = Asian Development Bank, ICB = international competitive bidding, MOEP = Ministry of Electric Power.
Source: Asian Development Bank estimates.

[31] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

## IV. ASSURANCES AND CONDITIONS

30. The government and MOEP have assured ADB that implementation of the project shall conform to all applicable ADB policies including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the project administration manual and loan documents.

31. The government and MOEP have agreed with ADB on certain covenants for the project, which are set forth in the draft loan agreement.

## V. RECOMMENDATION

32. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan in various currencies equivalent to SDR38,879,000 to the Republic of the Union of Myanmar for the Power Distribution Improvement Project, from ADB's Special Funds resources, with an interest charge at the rate of 1.0% per annum during the grace period and 1.5% per annum thereafter; for a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan agreement presented to the Board.

Takehiko Nakao
President

15 November 2013

## DESIGN AND MONITORING FRAMEWORK

| Design Summary | Performance Targets and Indicators with Baselines | Data Sources and Reporting Mechanisms | Assumptions and Risks |
|---|---|---|---|
| **Impact**<br>Reduced power distribution loss and improved energy efficiency | By 2018<br>Distribution losses in project areas: 14.2% (baseline: 18.2% in 2012)<br>$CO_2$ reduction of 31,990 t$CO_2$ | National statistics<br>Annual performance reports of ESE and YESB<br>Project benefit monitoring and postevaluation reports | **Assumption**<br>Associated improvements in power generation and transmission will occur<br>**Risk**<br>Limited government financing capacity results in delays of power improvements |
| **Outcome**<br>Improved infrastructure to provide reliable and sustainable electricity to the selected townships and districts | By 2016<br>Electrification ratio: 35% (baseline: 28% in 2012) | National statistics<br>Annual performance reports of ESE and YESB<br>Project benefit monitoring and post evaluation reports | **Assumption**<br>Counterpart staff familiar with ADB procedures can be retained within ESE and YESB<br>**Risk**<br>Distribution projects not financed by ADB have implementation delays |
| **Outputs**<br>1. Rehabilitated distribution network in five townships in Yangon region<br>2. Rehabilitated distribution network in four districts in Mandalay region<br>3. Rehabilitated distribution network in five districts in Sagaing region<br>4. Rehabilitated distribution network in two townships in Magway region | By 2016<br>Four 66 kV SS, four 33 kV SS, 105 km of 11 kV line, 229 km of ABC LV line, 36 distribution transformers in five townships in Yangon<br>Two 66 kV SS, twenty 33 kV SS, 228 km ABC LV line, 71 distribution transformers, 55,000 digital revenue meters in Mandalay region<br>Three 33 kV SS, 11 km of 11 kV line, 80 km of ABC LV line, 33 distribution transformers, 1,200 digital revenue meters in Sagaing region<br>One 66 kV SS, 7 km of 33 kV line, 44 km of 11 kV line, 127 km of ABC LV line, 107 distribution transformers, 1,937 digital revenue meters in Magway region | MOEP, ESE, and YESB annual reports<br>ADB review missions<br>ADB project completion report | **Assumption**<br>Estimated prices and physical contingencies are sufficient to allow potential increases in costs<br>**Risk**<br>Startup delays result from lengthy approval process for loan effectiveness |

| Activities with Milestones | Inputs |
|---|---|
| **1. Rehabilitated distribution network in five townships in Yangon region**<br>1.1 Recruit project implementation consultant and complete bidding documents (June 2014)<br>1.2 Complete bidding, evaluation, and approvals (December 2014)<br>1.3 YESB completes detailed design (December 2015)<br>1.4 Manufacture and deliver goods (June 2016)<br>1.5 Rehabilitate and install works (December 2016)<br>1.6 Build capacity of PMU staff on rehabilitation and operation of power distribution system, procurement, and financial management during implementation (December 2016)<br>1.7 Complete project implementation supervision (December 2016) | **Loan**<br>**ADB: $60 million**<br>**Government: $13.7 million** |
| **2. Rehabilitated distribution network in four districts in Mandalay region**<br>2.1 Recruit project implementation consultant and complete bidding documents (June 2014)<br>2.2 Complete bidding, evaluation, and approvals (December 2014)<br>2.3 ESE completes detailed design (December 2015)<br>2.4 Manufacture and deliver goods (June 2016)<br>2.5 Complete rehabilitation and installation works (December 2016)<br>2.6 Build capacity of PMU and PIU staff on rehabilitation and operation of power distribution system, procurement, and financial management during implementation (December 2016)<br>2.7 Complete project implementation supervision (December 2016) | |
| **3. Rehabilitated distribution network in five districts in Sagaing region**<br>3.1 Recruit project implementation consultant and complete bidding documents (June 2014)<br>3.2 Complete bidding, evaluation, and approvals (December 2014)<br>3.3 ESE completes detailed design (December 2015)<br>3.4 Manufacture and deliver goods (June 2016)<br>3.5 Complete rehabilitation and installation works (December 2016)<br>3.6 Build capacity of PMU and PIU staff on rehabilitation and operation of power distribution system, procurement, and financial management during implementation (December 2016)<br>3.7 Complete project implementation supervision (December 2016) | |
| **4. Rehabilitated distribution network in two townships in Magway region**<br>4.1 Recruit project implementation consultant and complete bidding documents (June 2014)<br>4.2 Complete bidding, evaluation, and approvals (December 2014)<br>4.3 ESE completes detailed design (December 2015)<br>4.4 Manufacture and deliver goods (June 2016)<br>4.5 Complete rehabilitation and installation works (December 2016)<br>4.6 Build capacity of PMU and PIU staff on rehabilitation and operation of power distribution system, procurement, and financial management during implementation (December 2016)<br>4.7 Complete project implementation supervision (December 2016) | |

ABC = aerial-bundled conductor, ADB = Asian Development Bank, $CO_2$ = carbon dioxide, ESE = Electricity Supply Enterprise, km = kilometer, kV= kilovolt, LV = low voltage, MOEP = Ministry of Electric Power, PIU = project implementation unit, PMU = project management unit, SS = substation, $tCO_2$ = tons of carbon dioxide, YESB = Yangon City Electric Supply Board.

Source: Asian Development Bank estimates.

**LIST OF LINKED DOCUMENTS**

http://adb.org/Documents/RRPs/?id=46390-003-3

1. Loan Agreement
2. Sector Assessment (Summary): Energy
3. Project Administration Manual
4. Contribution to the ADB Results Framework
5. Development Coordination
6. Financial Analysis
7. Economic Analysis
8. Country Economic Indicators
9. Summary Poverty Reduction and Social Strategy
10. Initial Environmental Examination
11. Risk Assessment and Risk Management Plan