Report and Recommendation of the President to the Board of Directors

Project Number: 50020-002
October 2018

Proposed Loan
Republic of the Union of Myanmar: Power Network Development Project

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 15 October 2018)

Currency unit	=	kyat (MK)
MK1.00	=	$0.000631
$1.00	=	MK1,585.00

ABBREVIATIONS

ADB	–	Asian Development Bank
DPTSC	–	Department of Power Transmission and System Control
EIA	–	environmental impact assessment
EMP	–	environmental management plan
ESE	–	Electricity Supply Enterprise
IEE	–	initial environmental examination
JICA	–	Japan International Cooperation Agency
MOEE	–	Ministry of Electricity and Energy
PAM	–	project administration manual
PIC	–	project implementation consultant
PIU	–	project implementation unit
PMU	–	project management unit
REGDP	–	resettlement and ethnic group development plan
SCS	–	stakeholder communication strategy

WEIGHTS AND MEASURES

GWh	–	gigawatt-hour
kV	–	kilovolt
kWh	–	kilowatt-hour
MW	–	megawatt

NOTES

(i) The fiscal year (FY) of the Government of Myanmar ends on 30 September. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2018 ends on 30 September 2018.

(ii) In this report, “$” refers to United States dollars.

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PROJECT AT A GLANCE

1. Basic Data				**Project Number:** 50020-002
Project Name	Power Network Development Project	**Department /Division**	SERD/SEEN	
Country	Republic of the Union of Myanmar	**Executing Agency**	Ministry of Electricity and Energy	
Borrower	Republic of the Union of Myanmar			

2. Sector	**Subsector(s)**		**ADB Financing ($ million)**
✓ **Energy**	Electricity transmission and distribution		298.90
		Total	**298.90**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	CO_2 reduction (tons per annum)	540,000
		Climate Change impact on the Project	Low
Environmentally sustainable growth (ESG)	Eco-efficiency		
	Global and regional transboundary environmental concerns	**ADB Financing**	
		Mitigation ($ million)	101.00

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Private sector development (PSD)	Public sector goods and services essential for private sector development	No gender elements (NGE)	✓

5. Poverty and SDG Targeting		**Location Impact**	
Geographic Targeting	Yes	Rural	High
Household Targeting	No	Urban	Medium
SDG Targeting	Yes		
SDG Goals	SDG7		

6. Risk Categorization: Complex

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** B **Indigenous Peoples:** C

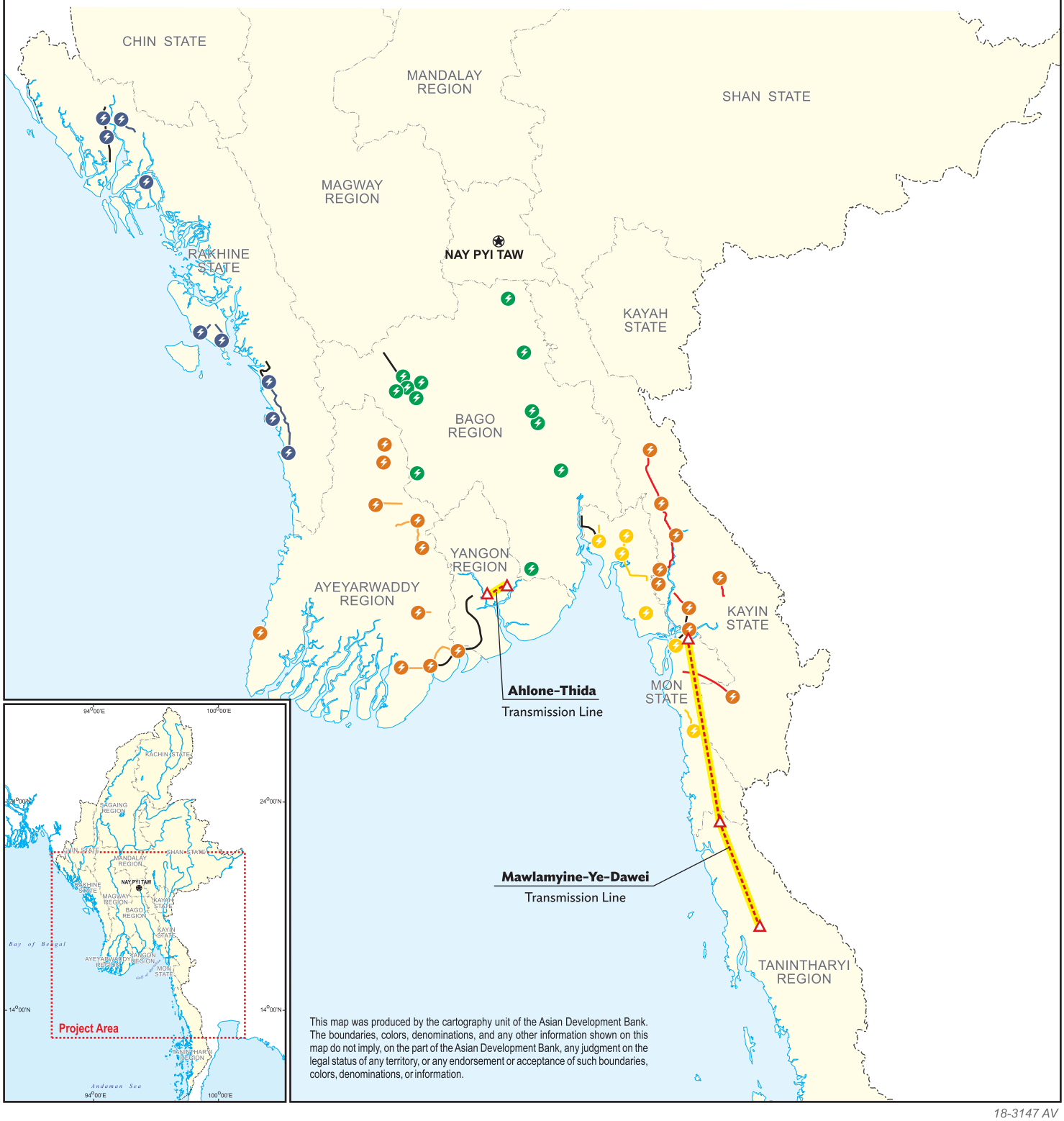
8. Financing

Modality and Sources	Amount ($ million)
ADB	**298.90**
Sovereign Project (Concessional Loan): Ordinary capital resources	298.90
Cofinancing	**0.00**
None	0.00
Counterpart	**10.00**
Government	10.00
Total	**308.90**

Currency of ADB Financing: USD

Source: Asian Development Bank

MYANMAR
POWER NETWORK DEVELOPMENT PROJECT



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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 Network Development Project.

2. The project will construct two 230-kilovolt (kV) transmission lines (of about 300 kilometers) with five 230 kV substations, 48 medium-voltage substations, and 843 kilometers of distribution lines in various states and regions in Myanmar. The project will install, for the first time, computerized systems to improve operational efficiency and reduce losses in the transmission and distribution systems. Such computerized systems will be introduced as a first step toward digitizing power system management in Myanmar.[1] The project will help increase the electricity supply in support of inclusive and sustainable development and achieve the country's target of universal electricity access by 2030. It is included in the country operations business plan, 2017–2019 of the Asian Development Bank (ADB) for Myanmar.[2]

II. THE PROJECT

A. Rationale

3. Decades of isolation and internal conflicts left Myanmar one of the poorest countries in Asia. In 2010, 37.5% of the 52 million population lived below the poverty line.[3] In 2012, Myanmar re-engaged with the international community initiating wide-ranging reforms including democratization, macro-economic policy adjustments and structural reforms. Since then, the economy grew steadily at more than 7% GDP growth per year, peaking at 8.4% in 2014,[4] and poverty declined to 26.1% by 2015 (footnote 3). Much of Myanmar's economic growth has been powered by the private sector. However, according to the World Bank Doing Business survey, Myanmar is ranked 151 out of 190 countries and lowest among the Association of Southeast Asian Nations in terms of adequacy of electricity services.[5] Moreover, continued internal conflicts remain a significant challenge for Myanmar's development, and consistent efforts are required to resolve the long-standing conflicts. The project aims to provide one of the most critical public services as a means of economic development and conflict resolution.

4. Myanmar has one of the lowest electrification rates in Asia, with only 35% of the households having access to electricity in 2016, and with wide rural and urban disparity. While electrification rates were 78% in Yangon, rural areas were significantly lower, with the lowest rates in Tanintharyi (9%), Rakhine (13%), Ayeyarwady (14%) and Kayin (16%).[6] Moreover, these are some of the poorest areas within the country. Given the severe lack of electricity in these areas, the economic and social development divide with urban areas persists, notably for business development and the provision of basic services such as health care and education.

5. The government has recognized the need to prioritize rural and underserved areas to promote economic opportunities for all as well as peace and stability. In response, the Myanmar

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[1] The Asian Development Bank (ADB) provided project preparatory technical assistance for Preparing the Power Network Development Project (TA 9179).
[2] ADB. 2016. *Country Operations Business Plan: Myanmar 2017–2019*. Manila.
[3] Government of Myanmar, Ministry of Planning and Finance and the World Bank. 2017. *An Analysis of Poverty in Myanmar*, *Part 1: Trend Between 2004/5 and 2015*. Nay Pyi Taw and Yangon.
[4] Country Economic Indicators (available from the list of linked documents in Appendix 2).
[5] The World Bank. 2018. *Doing Business 2018.* Washington DC.
[6] 2017 data from Electricity Supply Enterprise, Ministry of Electricity and Energy, Government of Myanmar.

Sustainable Development Strategy[7] prioritizes; (i) reliable and affordable electricity to support economic development and poverty reduction, and (ii) universal electricity access by 2030. However, to meet this goal, the government must solve the power industry's core development problems: lack of generating capacity and an insufficient and obsolete transmission and distribution infrastructure.

6. **Government response.** The government has initiated policy and institutional reforms to improve the efficiency of investment, operation, and management of the power sector and has mobilized resources to upgrade and expand power infrastructure.[8] Its long-term power development plans include (i) rehabilitating and constructing power plants to increase generating capacity; (ii) expanding and upgrading the transmission network to remove transmission constraints; and (iii) expanding distribution systems to connect more consumers to the electricity grid, particularly in underserved rural areas.[9]

7. **Investment requirement.** To meet the $35 billion–$40 billion required for the National Electricity Master Plan, the government mobilizes private investment for power generation where more competition is desirable. It will develop the transmission network through public finance, considering economies of scale and the capacity to enable open access to generating sources. Also, the government has started corporatizing the large distribution utilities to encourage their financial autonomy.

8. **Generation, transmission, and distribution.** The private sector has responded positively to investing in power generation.[10] Development partners have also funded the rehabilitation of aging plants and financed new ones.[11] While these projects reduce immediate supply constraints, more generating capacity is needed to meet rising demand, requiring about $20 billion in investment. The transmission network needs urgent rehabilitation and expansion to (i) connect the increasing generation capacity in the north with the major demand in central and southern Myanmar; and (ii) reduce transmission and distribution losses, which average 6%–8% for transmission (as high as 20% in some regions) and 13% for distribution. Transmission network development requires about $7 billion; distribution system upgrading, and expansion requires about $10 billion.

9. **Policy reforms.** Support from ADB, JICA, the World Bank, and others has enabled the government to implement policy and institutional reforms. These include creating a transparent mechanism for setting cost-reflected electricity tariffs, establishing an independent regulatory body to mobilize private investment, and corporatizing electricity supply entities to increase efficiency.

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[7] Government of Myanmar. 2018. Myanmar Sustainable Development Plan. Unpublished.

[8] Government of Myanmar. 2013. Myanmar Energy Policy 2013. Unpublished.

[9] The government prepared its (i) National Electricity Master Plan, updated since 2017, with Japan International Cooperation Agency (JICA) support; (ii) the National Electrification Plan with World Bank support, and (iii) the Myanmar Energy Master Plan with ADB support (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]).

[10] The private sector has submitted numerous proposals for hydro, solar, and thermal power plants. In 2018, the MOEE issued notices to proceed to six privately financed generation projects totaling more than 4,000 MW.

[11] Those projects include (i) the MOEE's addition of new hydropower plants and gas-fired plants; (ii) JICA-assisted rehabilitation of gas-fired plants in Yangon ($140 million loan) and Thilawa ($100 million loan) and the Baluchaung hydropower plant ($70 million grant); (iii) the World Bank Group-assisted Thaton gas-fired plant ($140 million loan); and (iv) the ADB-supported nonsovereign Myingyan power plant (ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Guarantee for the Myingyan Natural Gas Power Project in Myanmar*. Manila [Loan 3359]).

10. **Value added by ADB assistance.** Since 2012, ADB has provided $4.7 million in technical assistance to help (i) prepare the Electricity Law (2014) and the energy master plan and (ii) draft renewable energy and energy efficiency policies.[12] ADB has also provided (i) $140 million from the Asian Development Fund to upgrade electricity infrastructure, and (ii) a private sector loan of $152.2 million plus a political risk guarantee for a high-efficiency combined-cycle gas-fired power plant.[13] ADB's timely and targeted assistance added value by addressing the most urgent needs, including policy and institutional development, capacity building, and investment. Lessons learned from previous assistance confirm that aligning project design with government plans, close cooperation with the MOEE in project execution, and hands-on capacity building would make ADB assistance relevant and effective.

11. ADB has adopted a conflict sensitive approach to ensure that ADB assistance (i) will not exacerbate ongoing conflicts, (ii) contributes to Myanmar's inclusive development, ensuring equitable benefit to all communities, and (iii) will not be disrupted by local conflicts. To achieve this, ADB project design includes measures to ensure that project affected people are properly informed about the project, involved in project decision making, particularly with respect to compensation for adverse impacts, and have equal opportunity to participate in, and obtain project benefits. Such measures include a stakeholder communication strategy and implementation plan, articulated in the project administration manual (PAM),[14] resettlement and ethnic development plans, and proper implementation and monitoring of these plans.[15] The conflict sensitive approach designed for the project will be applied specifically for the three conflict affected states: Kayin, Mon, and Rakhine, where the project will build distribution facilities to support rural electrification in these areas (para. 14). The Summary of Project Activities in Conflict-Affected Areas contains further information on these subprojects.[16]

12. **Development coordination.** ADB, JICA, the World Bank, and other development partners closely coordinate their assistance for the power sector in Myanmar, through active participation in the Sector Coordination Group, chaired by the MOEE union minister. Guided by the Myanmar Development Assistance Policy,[17] Sector Coordination Group meetings discuss and prioritize areas for assistance, review implementation challenges, and propose actions to ensure efficient use of international assistance for the sector.[18] As a result, ADB focuses its assistance on strengthening the 230 kV transmission system and the 66 kV, 33 kV, and 11 kV distribution

[12] ADB technical assistance and grants covered (i) capacity building and institution support; (ii) policy, strategy, master plan, legal, and regulatory framework development; (iii) off-grid renewable energy demonstration; (iv) investment project feasibility study; (v) financial management assessment of the energy sector; (vi) country safeguard system strengthening; and (vii) public–private partnership framework development.

[13] ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of the Union of Myanmar for the Power Distribution Improvement Project*. Manila (Loan 3084); ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of the Union of Myanmar for the Power Transmission Improvement Project*. Manila (Loan 3330); ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Guarantee for the Myingyan Natural Gas Power Project in Myanmar*. Manila (Loan 3359).

[14] Project administration manual (accessible from the list of linked documents in Appendix 2).

[15] Resettlement and Ethnic Group Development Plan: Transmission, and Resettlement and Ethnic Group Development Plan: Distribution (available from the list of linked documents in Appendix 2).

[16] Summary of Project Activities in Conflict-Affected Areas: Kayin, Mon, and Rakhine States (accessible from the list of linked documents in Appendix 2).

[17] Government of Myanmar, Ministry of Planning and Finance. 2018. *Myanmar Development Assistance Policy*. Nay Pyi Taw.

[18] The Myanmar Development Assistance Policy established the Power Sector Coordination Group in 2017. ADB, JICA, and the World Bank co-lead the group, which includes other development partners from France, Germany, Italy, Norway, the United Kingdom, and the United States.

systems; JICA will finance the 500 kV backbone and the rehabilitation of the Yangon distribution system; and the World Bank will support on-grid and off-grid rural electrification and tariff reform.[19]

13. **Project focus.** The Yangon region is the center of business and socioeconomic development, accounting for 50% of the country's electricity consumption. Yangon's transmission system consists mainly of low voltage facilities, which need upgrading to a high voltage system. The ongoing ADB-financed Power Transmission Improvement Project is upgrading the Thida–Thaketa–Kyaikasan section from 66 kV to 230 kV.[20] This proposed project will upgrade the Ahlone–Thida section. Upon project completion, the Yangon power system will have a complete 230 kV transmission ring, which will increase transmission capacity and reliability and reduce transmission losses. Separately, the government is determined to connect Tanintharyi—the country's southernmost region and the only region without a transmission system—to the national transmission network. The proposed Mawlamyine–Ye–Dawei 230 kV transmission line is the first step toward realizing this vision.

14. In parallel with developing the transmission network, the government needs to expand distribution systems to achieve universal electrification by 2030. The proposed strengthening and expansion of distribution systems in the Ayeyarwady and Bago regions and in Kayin, Mon, and Rakhine states directly contribute to achieving this target. These regions and states have poverty rates higher than the national average and electrification rates below the 35% national average. Currently, poverty rates are 45% in Ayeyarwady, 30% in Bago, 41% in Kayin, 53% in Mon, and 78% in Rakhine[21] and electrification rates are 14% in Ayeyarwady, 31% in Bago, 16% in Kayin, 38% in Mon, and 13% in Rakhine (footnote 6). The project is expected to enable the government to electrify an additional 330,000 households in more than 2,000 villages, doubling the average electrification rate in the project areas from 28% to 56% by 2026. Additionally, 1,400 schools, clinics, hospitals, and libraries will gain access to grid electricity. The project will install, for the first time, a computerized transmission asset management system and a computerized customer billing system—the first step toward digitizing power system management in Myanmar—to improve operational efficiency, effectively manage assets, and reduce nontechnical losses. The project will build distribution subprojects in the conflict affected areas, namely in Kayin, Mon, and Rakhine states, where the ADB conflict sensitive approach (para. 11) will be implemented (footnote 16).

15. The project, prepared in response to the government's request, is aligned with ADB's Strategy 2030 (Table 1).[22]

Table 1: Alignment with Strategy 2030

Strategy 2030 Priorities	Contribution
1. Addressing remaining poverty and reducing inequalities	• Ensuring reliable and affordable electricity to support economic development and poverty reduction via (i) connecting the Tanintharyi region to the national network; (ii) strengthening the Yangon electricity transmission system which is essential for efficient supply to Myanmar's economic engine, and (iii) providing electricity access to more than 330,000 households in rural areas.
2. Promoting rural development and food security	• Helping the government achieve its national goal of universal electrification by 2030 by targeting states and regions with high rural populations and electrification rates below the country's already low average.

[19] Development Coordination (accessible from the list of linked documents in Appendix 2).
[20] ADB. 2015. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of the Union of Myanmar for the Power Transmission Improvement Project*. Manila (Loan 3330).
[21] ADB. 2017. *Socio-economic and Poverty Assessment—Distribution Component.* Consultant's report. Manila (TA 9179-MYA).
[22] ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific.* Manila.

16. The project is also in line with ADB's country strategy and government plans. The project design took into account the lessons from the first two ADB-supported projects: advanced contracting of turnkey contracts is preferable and hands-on assistance to the project implementation unit (PIU) is necessary. ADB will closely coordinate its long-term sector support with other development partners and private investors.

B. Impact and Outcome

17. The project impact is aligned with universal electricity access achieved.[23] The project outcome will be capacity and operational efficiency of power transmission and distribution in central and southern Myanmar increased.[24]

C. Outputs

18. **Output 1: Myanmar's 230 kV transmission network expanded.** This will be delivered by construction and commissioning of 302 km of 230 kV transmission lines and 800 MVA of 230 kV transformer capacity in Tanintharyi and Yangon regions (footnote 24).

19. **Output 2: New distribution facilities added to the distribution systems in the Ayeyarwady and Bago regions and in Kayin, Mon, and Rakhine states.** This will be delivered by construction and commissioning 843 km of distribution lines and 48 distribution substations (footnote 24).

20. **Output 3: A new computerized asset management system and a computerized customer billing system installed.** This includes design, installation and testing of these systems (footnote 24).[25]

D. Summary Cost Estimates and Financing Plan

21. The project is estimated to cost $308.9 million (Table 2).

Table 2: Summary Cost Estimates

($ million)

Item			Amount
A.	**Base Cost**[a]		
	1.	Transmission system expansion	152.1
	2.	Distribution system augmentation and reinforcement	103.1
	3.	Computerized asset management and billing systems	7.3
		Subtotal (A)	**262.5**
B.	**Contingencies**[b]		**38.6**
C.	**Financing Charges During Implementation**[c]		**7.8**
		Total (A+B+C)	**308.9**

[a] In second quarter 2018 prices. Includes taxes and duties of $10.27 million for transmission and $7.31 million for distribution. Such amount does not represent an excessive share of the project cost.
[b] Computed at 8.8% of base costs. Price contingencies computed using ADB forecasts of international and domestic inflation. Includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.
[c] Interest during implementation has been computed at 1%.
Sources: Executing agency and ADB estimates.

[23] Government of Myanmar. 2014. National Electrification Plan. Unpublished.
[24] The design and monitoring framework is in Appendix 1.
[25] The computerized assets management system is part of the transmission component and the computerized customer billing system is part of the distribution component, both to be introduced for the first time.

22. The government has requested a concessional loan of $298.9 million from ADB's ordinary capital resources to help finance the project, including taxes and duties and interest during implementation.[26] The loan will have a 32-year term, including a grace period of 8 years; an interest rate of 1.0% per year during the grace period and 1.5% per year thereafter; and such other terms and conditions set forth in the draft loan agreement. The financing plan is in Table 3. Details are in the PAM (footnote 14).

Table 3: Summary Financing Plan

Source	Amount ($ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (concessional loan)	298.9	96.8
Government	10.0	3.2
Total	**308.9**	**100.0**

Source: Executing agency and Asian Development Bank estimates.

23. **Climate finance.** The project will reduce 540,000 tons per year of greenhouse gas emissions. The ADB loan will finance this climate mitigation estimated to cost $101 million.

E. Implementation Arrangements

24. The MOEE will be the executing agency in charge of intra- and inter-ministerial project coordination. The Department of Power Transmission and System Control (DPTSC) will be the implementing agency for the transmission component; the Electricity Supply Enterprise (ESE) will be the implementing agency for the distribution component. The DPTSC and the ESE will each set up a PMU and PIUs to manage day-to-day implementation. The implementation arrangements are summarized in Table 4 and described in detail in the PAM (footnote 14).

Table 4: Implementation Arrangements

Aspects	Arrangements		
Implementation period	March 2019–June 2025		
Estimated completion date	30 June 2025		
Estimated loan closing date	31 December 2025		
Management			
(i) Executing agency	Ministry of Electricity and Energy		
(ii) Implementing agencies	DPTSC and ESE		
(iii) PMUs and PIUs	The DPTSC and the ESE will each set up a PMU and PIUs to handle day-to-day implementation of the project's transmission and distribution components. The PAM outlines the staffing and responsibilities of the PMUs and the PIUs. The PICs will support the PMUs and the PIUs in project implementation.		
Procurement	International competitive bidding	11 contract packages	$219.80 million[a]
	National competitive bidding	3 contract packages	$22.27 million[a]
Consulting services	QCBS 90:10 (firm), transmission	281 person-months	$5.45 million[a]
	QCBS 90:10 (firm), distribution	300 person-months	$5.03 million[a]
Advance contracting	PIC recruitment, Mawlamyine–Ye–Dawei subproject bidding		
Disbursement	The loan proceeds will be disbursed following ADB's *Loan Disbursement Handbook* (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

DPTSC = Department of Power Transmission and System Control, ESE = Electricity Supply Enterprise, PAM = project administration manual, PIC = project implementation consultant, PIU = project implementation unit, PMU = project management unit, QCBS = quality- and cost-based selection.
[a] Base cost plus taxes and duties.
Source: Asian Development Bank estimates.

[26] The ADB loan will finance taxes and duties because (i) the amount is within reasonable country thresholds, (ii) the amount of taxes and duties financed by the ADB loan does not represent an excessive share of the project investment plan, (iii) ADB financing will be limited to those taxes and duties that apply only to ADB-financed expenditures, and (iv) the financing of such taxes and duties is material and relevant to the success of the project.

III. DUE DILIGENCE

A. Technical

25. Technical due diligence has ensured that the project design meets international technical standards and has provided sufficient data and specifications for preparing draft bidding documents. The DPTSC will use computerized systems to enhance assets management and help improve its operational efficiency. Similarly, the computerized billing system will help the ESE improve its revenue collection.

B. Economic and Financial

26. **Economic analysis.** The project's economic viability assessment followed ADB's Guidelines for the Economic Analysis of Projects[27] by comparing societal costs and benefits of the with-project scenario with the without-project scenario. The project will significantly increase electricity transmission and distribution capacity, reduce losses, and enhance the security and reliability of the supply in seven central and southern regions and states of Myanmar.

27. The project's quantifiable benefits include increased electricity supply with higher reliability for the Yangon region (3,097 gigawatt-hours [GWh]) by 2034, provision of 962 GWh of grid electricity to the Tanintharyi region by 2030 (currently the region uses diesel-based electricity), and electrification of 330,000 households and 1,400 public buildings (schools, clinics, village offices) in selected ESE distribution areas in five regions and states. By 2030, the ESE's electricity supply will increase by 1,981 GWh and its distribution losses will drop 2 percentage points from 13% in 2016. The replacement of diesel and other fuels with grid electricity and the distribution loss reduction resulting from the project will reduce about 13.5 million tons of carbon dioxide over 25 years. The economic internal rate of return for the project is 17.7%. A sensitivity analysis confirms the project's economic viability regarding important project variables.[28]

28. **Financial analysis.** The financial evaluation of the distribution component of the project followed ADB's Guidelines for Financial Management and Analysis of Projects.[29] The analysis examined the financial viability of the proposed reinforcement and expansion of the distribution network owned and operated by the ESE. The transmission component will be implemented by the DPTSC, a nonrevenue-generating entity. As such, the transmission component was excluded from the financial analysis.

29. The ESE's profitability has declined in FY2015 and FY2016 because of (i) the inadequate tariff margin (the difference between the buying and selling prices) set by the government; and (ii) the separation of electricity distribution in Mandalay to a stand-alone entity in FY2016, resulting in the loss of a high-value customer base. As the ESE gears up its capital investment program to expand and reinforce its network, the government needs to increase the tariff margin to allow the ESE to generate enough cash to meet its expenditure and debt service obligations. Otherwise, the government would have to continue its budgetary support, which is not sustainable.

30. The analysis was performed by comparing the future incremental benefits accrued from additional electricity sales and the incremental costs to the ESE in real terms, discounted to their present value. The post-tax financial net present value of the incremental cash flows discounted

[27] ADB. 2017. *Guidelines for the Economic Analysis of Projects*. Manila.
[28] Economic Analysis (accessible from the list of linked documents in Appendix 2).
[29] ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

at the weighted average cost of capital is $54.7 million. The post-tax real financial internal rate of return of the project is 2.8%, which is higher than the weighted average cost of capital of 0.2%.[30]

C. Governance

31. The financial management and sustainability risk is *high* mainly because of three weaknesses: (i) the DPTSC's dependence on the MOEE's budget allocation for its operation and investment; (ii) the ESE's dependence on the tariff margin, for which a transparent mechanism for review and adjustment is still being developed; and (iii) weaknesses in internal financial management and reporting. To help mitigate these risks, the project proposes regular reviews and adjustments of electricity tariffs to recover costs and strengthening of the technical and financial performance of the ESE and the DPTSC. The long-term solution will be transformation of the DPTSC and ESE into independent transmission and distribution companies, which is being supported through the Sector Coordination Group.

32. The government regulates electricity tariffs, which (depending on consumption level) range from MK35 to MK50 per kWh for residential consumers and MK75 to MK150 per kWh for industrial and commercial consumers. Such low tariffs necessitate government subsidies for the DPTSC and the ESE. The government is conducting an analytical study to devise a tariff adjustment mechanism that allows tariffs to reflect electricity supply costs. The last retail tariff increase in 2015 led to a weighted average increase of about 40% over 2014 tariffs. Going forward, the government is implementing rules and regulations under the Electricity Law (2014) so that electricity tariffs will promote the efficiency and economy of the power industry, while also meeting the government's poverty reduction objective through a lifeline tariff.[31]

33. The government is committed to promoting good governance and addressing corruption. The Anticorruption Law currently in use was promulgated in July 2013. ADB's Anticorruption Policy (1998, as amended from time to time) was explained to and discussed with the government and the MOEE. The specific policy requirements and supplementary measures are described in the PAM (footnote 14). ADB has organized and will continue organizing training for MOEE, DPTSC, and ESE staff covering ADB guidelines and procedures for procurement, disbursement, reporting, monitoring (by ADB staff and the project implementation consultants), and prevention of fraud and corruption (by ADB staff).

D. Poverty, Social, and Gender

34. The project helps achieve the target of 100% household electrification by 2030. The project beneficiaries are households, businesses, and public institutions in the regions and states of Ayeyarwady, Bago, Kayin, Mon, Rakhine, Tanintharyi, and Yangon. Under the distribution component, 330,000 households and 1,400 public buildings (schools, clinics, and hospitals) will be newly electrified, doubling the average electrification ratio of the concerned states and regions from the 28% to 56%. Consumers in the Tanintharyi and Yangon regions will benefit from electricity made available from greater transmission capacity. The availability of electricity improves health outcomes, increases employment and income opportunities, and improves living conditions for women and children. The application of the ADB conflict sensitive approach throughout project implementation will ensure that project affected peoples can participate in project design, and will have equal opportunities to be connected, with fair and equitable

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

[31] A lifeline tariff is a targeted subsidy based on household consumption levels. The tariff for the first block of consumption—equal to the basic needs of the poor—is provided at a subsidized rate, while the tariff for subsequent blocks are cost-reflective.

distribution of project benefits, without any bias or preferential treatment for any group over another (para. 11).

35. Although the project is classified *no gender elements*, it will give women job opportunities, particularly during the construction of the distribution component. The influx of male workers at future construction sites may lead to higher risk of sexually transmitted diseases. To mitigate this impact, construction contracts will include prevention and health and safety measures. In addition, the environmental management plan (EMP) includes a code of conduct for workers. The PICs will conduct training sessions and information campaigns for the PIUs, local communities, and workers on gender issues, HIV/AIDS, and human trafficking. The summary poverty reduction and social strategy describes the project's social aspects.[32]

36. MOEE prepared a stakeholder communication strategy (SCS) in consultation with the ADB. The SCS supports two-way and effective communication and information sharing with project beneficiaries, project-affected people, and other concerned stakeholders (including women and vulnerable groups) throughout the project, thus facilitating understanding and acceptance of the project. The SCS includes the actions and responsibilities of the PIUs and the PMUs in implementing activities under the SCS.

E. Safeguards

37. Based on technical due diligence and feasibility design, the implementing agencies have prepared project safeguard documents following government laws and regulations and ADB's Safeguard Policy Statement (2009).[33] These include (i) an initial environmental examination (IEE),[34] and (ii) a resettlement and ethnic group development plan (REGDP) for each project component (footnote 15). In compliance with ADB's Safeguard Policy Statement, the project's safeguard categories are described in paras. 38–45.

38. **Environment (category B).** The IEEs identified the project's potential environmental impacts and proposed measures to mitigate them through the EMPs. The implementing agencies prepared the EMPs in consultation with the affected communities and stakeholders, following government laws and regulations and ADB's Safeguard Policy Statement. The IEEs found that the project does not cause significant adverse environmental impacts as the rights-of-way of transmission lines and substation locations avoid environmentally sensitive areas. The potential environmental impacts are primarily noise and dust from construction and risks to occupational and community health and safety, which can be mitigated and managed. Expected impacts are site-specific, and the EMPs have incorporated appropriate mitigation measures.

39. The EMPs are part of the bidding documents. Before awarding contracts, the DPTSC and the ESE will reassess the potential impacts on the environmental receptors and will make sure that appropriate mitigation measures are in place. No construction work will be allowed before ADB approves the updated IEEs, and EMPs. The IEEs, and EMPs specify a grievance redress mechanism and monitoring requirements.

40. **Involuntary resettlement (category B) and indigenous peoples (category C).** The project involves (i) permanent land acquisition for substations and tower footings of transmission and distribution lines and (ii) temporary impacts during the construction of the project facilities.

[32] Summary Poverty Reduction and Social Strategy (accessible from the list of linked documents in Appendix 2).
[33] The implementing agencies held 21 stakeholder consultations involving more than 1,000 participants.
[34] Initial Environmental Examination (accessible from the list of linked documents in Appendix 2).

The permanent and temporary impacts will affect 714 households under the transmission component and 20 households under the distribution component.

41. The project will permanently acquire 38 hectares of land for the distribution component and 1 hectare for the transmission component, which will be used for the substations and tower footings. This will have a severe impact on 18 households (totaling 91 people): 9 households will lose their primary residential structures under the transmission component; another 9 will lose more than 10% of their total landholdings or income under the distribution component. Both components also involve temporary impacts on crops and rubber plantations. Crops will be removed from the line corridor during construction and height limitations on trees within the line corridor will be enforced. In addition, 445 shops along the transmission line alignment will be disturbed during construction. The temporary impacts are expected to be minimal because of the wide use of road easements, the short construction period, and construction during the dry season when most of the farmland lies fallow.

42. The project has identified 117 vulnerable households, comprising 65 households headed by women, 43 very poor households, and 9 households that have people with disabilities. In addition to compensation per the entitlement, the project will facilitate their participation in livelihood development activities in the project areas to improve their income generation opportunities. These measures will restore the income and standard of living of the vulnerable households and no further income restoration program is needed.

43. All affected households are entitled to compensation at full replacement cost for their lost assets, incomes, and businesses. The REGDPs specify the implementation arrangements, monitoring requirements, and grievance redress mechanisms. The compensation budget is included in the project costs to be financed by the MOEE. The implementing agencies will update the REGDPs based on detailed engineering design and have them approved by ADB before any physical or economic displacement takes place.

44. Three states—Kayin, Mon, and Rakhine—have ethnic groups living in the project areas. The project will not acquire lands that are traditionally used by the ethnic groups nor cause any adverse impacts on the identity, society, culture, and areas of spiritual importance or interfere with their sociocultural beliefs and livelihood systems. Ethnic group communities will benefit equally from the project through job opportunities and household electrification. The implementing agencies have properly consulted the ethnic groups and will address their concerns during REGDP implementation.

45. The MOEE will recruit PICs with international and national safeguards specialists (for the environment and social safeguards) to assist the PMUs and the PIUs in updating and implementing the EMPs and REGDPs. The PICs will also train the PMUs and the PIUs on environmental management and on EMP and REGDP implementation. The project implementation costs incorporate the estimated budget for the implementation of the safeguard mitigation plans.

F. Summary of Risk Assessment and Risk Management Plan

46. The major risks and mitigating measures are summarized in Table 5 and described in detail in the risk assessment and risk management plan.[35]

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

Table 5: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
Instability in Rakhine state may prevent compliance with Asian Development Bank's (ADB) conflict-sensitive approach, including project consultations with all stakeholders and equitable distribution of project benefits.	Following ADB's Safeguard Policy Statement (2009) and conflict-sensitive approach, the Ministry of Electricity and Energy (MOEE) and the government have agreed to the following specific assurances and conditions in the loan agreement: the state and regional governments, the MOEE, and the Electricity Supply Enterprise (ESE), at all levels, will make sure that (i) all households and communities in the subproject areas will have equal opportunities to connect to electricity grid; (ii) ADB has access to the project areas and can conduct consultations about the project with all stakeholders and communities throughout the project implementation period.
The government's multilayer approval requirements may delay recruitment of consultants and works and goods contracts.	ADB and development partners are working with the government to streamline approval procedures. Advance contracting is applied for the recruitment of the project implementation consultants. Consultants working under the project preparatory technical assistance prepare all bidding documents and take advance procurement actions as necessary[a]
Uncertainty on timely mobilization of large capital investments for the expansion of the generating capacity and rural electrification.	Development partners are working closely with the government to prioritize investment needs and help the government mobilize financing, including multilateral, bilateral, and private financing. ADB supports MOEE in preparing and applying a framework for PPP and in preparing a road map for corporatization of distribution companies to make them more attractive to investors.
The financial management and financial viability of the ESE and the Department of Power Transmission and System Control are weak.	Through the Sector Coordination Group, ADB and development partners are helping the MOEE prepare a cost-reflective tariff mechanism and improve financial management and reporting. The Loan Agreement includes a covenant requiring the Borrower to ensure that electricity tariffs are reviewed and adjusted in a timely manner for ESE to maintain financial sustainability.
Implementation of a mechanism for a full cost-recovery electricity tariff is delayed.	Considerable development partner efforts address this issue. A priority action plan between development partners and the MOEE included a transparent tariff-setting mechanism reflecting the full cost of supply. ADB assisted the government in preparing the rules and regulations for tariff setting and recommendations for tariff implementation based on cost-recovery principles. The World Bank supports studies on a mechanism for tariff setting and the impacts of tariff subsidies.

[a] ADB provided project preparatory technical assistance for Preparing the Power Network Development Project (TA 9179).
Source: ADB estimates.

IV. ASSURANCES

47. The government and the MOEE 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 PAM and loan documents. The government and the MOEE have agreed with ADB on certain covenants for the project, which are set forth in the draft loan agreement.

V. RECOMMENDATION

48. 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 of $298,900,000 to the Republic of the Union of Myanmar for the Power Network Development Project, from ADB's ordinary capital resources, on concessional terms, with an interest charge at the rate of 1.0% per year during the grace period and 1.5% per year 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

31 October 2018

DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with Universal electricity access achieved (National Electrification Plan, 2014)[a]			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting Mechanisms**	**Risks**
Outcome Capacity and operational efficiency of power transmission and distribution in central and southern Myanmar increased	By 2026 a. Capacity of the 230 kV transmission network increased by 800 MVA (2016 baseline: 5,460 MVA) b. Capacity of distribution systems (66 kV and 33 kV) in rural areas increased by 400 MVA (2016 baseline: 4,670 MVA) c. Household access to electricity increased by 330,000 households (2016 baseline: 3.8 million households or 35% national average) d. Technical and nontechnical distribution losses reduced by 2 percentage points (2016 baseline: 13%)	a–d. MOEE, DPTSC, and ESE annual reports; and project benefit monitoring and post-evaluation reports	Uncertainty in timely mobilization of large capital investments needed for the expansion of the generating capacity and rural electrification
Outputs 1. Myanmar's 230 kV power transmission network expanded 2. New distribution facilities added to the distribution systems in Ayeyarwady and Bago regions and in Kayin, Mon, and Rakhine states 3. New CAMS and CCBS installed	By 2025 (2016 baseline: not applicable) 1a. 230/66/11 kV (2x50 MVA) substation in Ye, 230/66/11 kV (2x50 MVA) substation in Dawei, and 286 km Mawlamyine–Ye–Dawei transmission line constructed and operational 1b. 230/66/11 kV 150 MVA substation in Ahlone, 230/66/11 kV (3x150 MVA) gas-insulated substation in Thida, and 16.6 km Ahlone–Thida transmission line constructed and operational 2a. 48 66/33/11 kV substations constructed and operational 2b. 843 km of distribution lines constructed and operational 3a. CAMS and CCBS installed and operational 3b. CAMS and CCBS operation and maintenance expertise transferred to the DPTSC and the ESE, such that at least 5 DPTSC staff can operate CAMS independently and at least 5 ESE staff can operate CCBS independently	1a–3b. DPTSC and ESE annual reports; and PIC quarterly reports	Implementation delays in the recruitment of consultants and works and good contracts because of the government's multilayer approval requirements

Key Activities with Milestones

1. Myanmar's 230 kV transmission network expanded

1.1 Mawlamyine–Ye–Dawei transmission line constructed and operational

1.1.1 Tender contract (Q2 2018–Q1 2019) (advance contracting)
1.1.2 Award contract (Q2 2019)
1.1.3 Update and finalize resettlement and land acquisition and environmental plans (Q2–Q3 2019)

1.1.4 Implement resettlement plan and land acquisition by section (Q3 2019–Q4 2020) 1.1.5 Implement contracts (Q3 2019–Q2 2021) 1.1.6 Test and commission substation (Q3–Q4 2021) **1.2 Ahlone–Thida transmission line constructed and operational** 1.2.1 Tender contract (Q3 2019–Q1 2020) 1.2.2 Award contract (Q2 2020) 1.2.3 Update and finalize resettlement and land acquisition and environmental plans (Q2–Q3 2020) 1.2.4 Implement resettlement plan and land acquisition by section (Q3 2020–Q2 2022) 1.2.5 Implement contracts (Q3 2020–Q4 2022) 1.2.6 Test and commission substation (Q1–Q2 2023) **2. New distribution facilities added to the distribution systems in Ayeyarwady and Bago regions and in Kayin, Mon, and Rakhine states** 2.1 Update bidding documents based on preliminary survey; update and implement safeguard plans, including resettlement and land acquisition and environmental plans (Q2 2019–Q1 2020) 2.2 Tender goods contract (Q4 2019–Q4 2020) 2.3 Deliver goods (Q3 2020–Q4 2021) 2.4 Tender work contract(s) (Q3 2020–Q4 2021) 2.5 Implement work contract(s) (Q1 2022–Q4 2024) 2.6 Test and commission distribution facilities (Q1 2024–Q2 2025) **3. New CAMS and CCBS installed** 3.1 Prepare bidding documents for CAMS and CCBS (Q3–Q4 2020) 3.2 Tender contracts (Q1 2021–Q4 2021) 3.3 Award contract(s) (Q4 2021) 3.4 Knowledge transfer to DPTSC and ESE staff (Q4 2021–Q2 2025) 3.5 Commissioning and capacity building for operation of CAMS and CCBS (Q4 2021–Q2 2025)
Project Management Activities Full establishment of implementing agencies, including steering committee, PMUs, PIUs, and working mechanism between implementing agencies and executing agency (Q1 2018) Loan approval (Q4 2018) PIC recruitment (Q2 2018) (advance contracting)
Inputs ADB: $298,900,000 (concessional loan) Government: $10,000,000
Assumptions for Partner Financing Not applicable

ADB = Asian Development Bank, CAMS = computerized assets management system, CCBS = computerized customer billing system, DPTSC = Department of Power Transmission and System Control, ESE = Electricity Supply Enterprise, km = kilometer, kV = kilovolt, MOEE = Ministry of Electricity and Energy, MVA = megavolt ampere, PIC = project implementation consultant, PIU = project implementation unit, PMU = project management unit, Q = quarter.

[a] Government of Myanmar. 2014. National Electrification Plan. Unpublished.

Source: ADB staff estimates.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=50020-002-3

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. Risk Assessment and Risk Management Plan
11. Initial Environmental Examination: Transmission
12. Initial Environmental Examination: Distribution
13. Resettlement and Ethnic Group Development Plan: Transmission
14. Resettlement and Ethnic Group Development Plan: Distribution

Supplementary Document

15. Summary of Project Activities in Conflict-Affected Areas: Kayin, Mon, and Rakhine States