



RESTRUCTURING PAPER  
ON A  
PROPOSED PROJECT RESTRUCTURING  
OF  
ELECTRIC POWER PROJECT  
APPROVED ON SEPTEMBER 24, 2013  
TO  
REPUBLIC OF THE UNION OF MYANMAR

ENERGY & EXTRACTIVES

EAST ASIA AND PACIFIC

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## ABBREVIATIONS AND ACRONYMS

ECC	Environmental Compliance Certificate
EPGE	Electric Power Generation Enterprise
DSI	Design, Supply and Installation
GWh	gigawatt-hour(s)
IDA	International Development Association
ISR	Implementation Status and Results Report
LD	liquidated damages
MJ	megajoule(s)
MOEE	Ministry of Energy and Electricity
MONREC	Ministry of Natural Resources, Environment, and Conversation
MW	megawatt(s)
NEP	National Electrification Program
PDO	Project Development Objective
SDR	Special Drawing Right(s)
TA	Technical Assistance
US\$	United States Dollar(s)



**BASIC DATA**

**Product Information**

Project ID P143988	Financing Instrument Investment Project Financing
Original EA Category Partial Assessment (B)	Current EA Category Partial Assessment (B)
Approval Date 24-Sep-2013	Current Closing Date 30-Oct-2019

**Organizations**

Borrower Republic of the Union of Myanmar	Responsible Agency Ministry of Electricity and Energy, Electric Power Generation Enterprise
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**Project Development Objective (PDO)**

Original PDO

Increase the capacity and efficiency of gas-fired power generation in Myanmar and strengthen the institutional capacity of relevant agencies.

**Summary Status of Financing**

Ln/Cr/Tf	Approval	Signing	Effectiveness	Closing	Net		
					Commitment	Disbursed	Undisbursed
IDA-53060	24-Sep-2013	12-Oct-2013	14-Jan-2014	30-Oct-2019	140.00	110.67	19.15

**Policy Waiver(s)**

Does this restructuring trigger the need for any policy waiver(s)?

No



## I. PROJECT STATUS AND RATIONALE FOR RESTRUCTURING

### A. Project Status

1. The Myanmar Government's Electric Power Project (the Project) is financed by International Development Association (IDA) Credit 53060 for SDR 92.6 million, equivalent to US\$140 million at the time of IDA approval in September 2013. The Project has two components: (1) construction of a new combined-cycle gas-fired power plant to replace an old, inefficient plant in Thaton, Mon State; and (2) technical assistance (TA) and advisory services to build the capacity of relevant agencies for (a) policy making and regulation in the power sector, and (b) project implementation. At appraisal, the estimated cost was US\$130 million for Component 1, and US\$10 million for Component 2. The Project objective and design remain highly relevant, as confirmed by the Project's mid-term review in October 2016.

2. Under Component 1, the new plant was completed (in construction terms) in May 2018 and was officially opened in April 2019. It has demonstrated the capability to exceed target values of outcome indicators for both generation capacity and efficiency. *Thermal efficiency of 52 percent has been achieved during testing for the new plant's two gas turbines and steam turbine in combined cycle peak output on April 30, 2019, consistent with the thermal efficiency of 52.6 percent contractual maximum guaranteed value of heat rate per the contract for plant.*<sup>1</sup> These values exceed the respective outcome indicator targets of 106 MW and 48% efficiency. The plant has thus already demonstrated the ability to generate nearly four times as much power as the existing plant for the same allocation of gas as the pre-existing old plant, and at a cost for design, supply and installation (DSI) that is 15 percent lower than estimated at appraisal.<sup>2</sup> As such, the plant will help meet Myanmar's acute energy shortages to benefit users of grid electricity in Mon State and nationally. This remains important at a time of rapid demand growth with the grid being extended to new users as part of the Government's ambitious national electrification program.

3. However, in May 2019, while undergoing further operational tests, a fault occurred in one of the gas turbines, disrupting plant operations. On checking, it was found that the other turbine also ran the risk of getting a similar fault in future. The plant was shut down and gas turbines disassembled and rotors sent abroad for repair. To expedite restart, the turbine supplier (GE Power) agreed to provide at no cost one new rotor and the second rotor was repaired in Singapore. The repairs have since been completed for both gas turbines, and engineering measures have been taken to avoid a repeat fault. Based on the latest schedule, the plant will recommence full operation after complete testing in December 2019, with the final major contractual milestones of Commercial Operation and Operational Acceptance to occur by January 2020, with high confidence notwithstanding any other unexpected contingencies.

4. Component 2—Technical Assistance and Advisory Services—is satisfactory. All activities are complete other than ongoing Owner's Engineer services, which are to support EPGE in the final steps of the Thaton plant commissioning. Achievements under this component include preparation of Myanmar's National Electrification Plan, now under implementation, and training and capacity building to staff of the Ministry of Energy and Electricity (MOEE), the implementing agency, Electric Power Generation Enterprise (EPGE), and related agencies on power sector and project management topics. Electricity tariff reforms came into effect in July 2019, informed by power sector financial viability analysis supported by this Project and technical assistance from the World Bank and Energy Sector Management

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<sup>1</sup> The contract was signed 26 January 2016 between the (former) Myanma Electric Power Enterprise and China Energy Engineering Groups Co. Ltd. Thermal efficiency is based on an assumed lower heating value of 857 British Thermal Units per standard cubic foot of gas.

<sup>2</sup> Compared to the original plan of 106 megawatts (MW) new installed capacity for US\$130 million, the contract provides for 119 MW at the price of US\$110.6 million. Performance tests have indicated a potential to reach further potential 130 MW capacity, and may generate more than 770 gigawatt-hours (GWh) per year. The existing plant has an installed capacity of 51 MW and has generated 140-220 GWh/year in recent years.



Assistance Program (ESMAP). The tariff reforms, which include lifeline rates for the lowest-volume users, constitute a major step forward in recovering the costs of power supply in an efficient and socially inclusive manner. In parallel, the Bank is also helping MOEE to implement in-house software for efficient dispatch of generation resources, to lower overall supply costs. Capacities built under the project, and lessons from the implementation of Component 1, are being applied in preparation of a new Myanmar Power System Efficiency Improvement Project (P162151).

5. The last Implementation Status and Results Report (ISR), dated July 2019, rates progress towards achievement of the PDO as Moderately Satisfactory, and overall implementation progress as Moderately Satisfactory (Moderately Satisfactory for Component 1 and Satisfactory for Component 2). That ISR downgraded achievement of the PDO from Satisfactory to Moderately Satisfactory due to the delay in commissioning resulting from technical breakdown of plant after completion while undergoing performance tests. The same ISR upgraded the rating for Technical Assistance and Advisory Services from Moderately Satisfactory to Satisfactory on the basis that related activities had been executed according to updated plans. Project objectives remain achievable with approval of this restructuring, as the only concern is related to commissioning not being fully completed by October 31, 2019. Extension of the closing date, and revision of certain results framework indicators to reflect the latest timeline for final stages of commissioning, would provide a basis for maintaining satisfactory progress ratings in this respect.

6. The July 2019 ISR rated environmental and social safeguards Moderately Satisfactory (Moderately Satisfactory for Environmental Assessment, and Satisfactory for Indigenous Peoples and for Involuntary Resettlement). An outstanding action on environmental safeguards is for EPGE to have the Thaton plant's Environmental Impact Assessment (EIA) revised to reflect comments from Ministry of Natural Resources and Environmental Conservation (MONREC), and re-submitted for issuance of an Environmental Compliance Certificate (ECC). EPGE has undertaken to further engage consultants' support to this end.<sup>3</sup> Regarding electrification of the villages nearby the Thaton power station—Kyar Ban (including Kayin Su, Pa'oh Su, and Thone Ein Su); Than Ban; and Nyaun Wain, Inne Shae—among a total of 965 households, 867 households have electricity access as of March 2019. Previously, 400 households lacked electrical connections. Thanks to corporate social responsibility contributions of the plant's design, supply and installation (DSI) contractor, China Energy Engineering Corporation (CEEC), in cooperation with Myanmar's Electricity Supply Enterprise, all but about 90 of these households have been connected to the electrical grid as of March 2019. The non-connected houses include some that are unoccupied, and others that have opted not to connect. Following previous consultations in nearby villages, EPGE plan additional public consultations in January 2020, using Karen language interpreter for villages with Karen speakers, and inviting World Bank staff to observe. EPGE will prepare a consultation report in English and Burmese, upload to EPGE website, and provide printed copy to villages.

7. Financial management is rated Moderately Satisfactory. The total amount disbursed to date is US\$ 110.67 million or 85.25 percent of the IDA Credit. A share of IDA Credit proceeds is expected to remain unused at Project closing due to: (a) savings under Component 1; (b) mobilization of trust fund grants for TA and advisory services, which reduce the need to use IDA Credit proceeds for these activities under Component 2; and (c) liquidated damages (LD) under EPGE's contract with CEEC. LD are likely to hit the maximum ceiling of 10% of the original contract price, for delays in the CCGT Commercial Operation Date (COD), contractually due in June 2018. This would be equal to the final payment due to contractor on Operational Acceptance. Exchange rate fluctuations mean that the final amount of any unutilized proceeds will be known around the time of the actual closing date. There are no overdue audit reports. Financial management performance complies with Bank requirements.

8. Procurement performance is rated Moderately Satisfactory. No new procurement is occurring except for amendment of the contract with Owner's Engineer (Tractebel Engie) to ensure assistance to EPGE in supervising the

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<sup>3</sup> To date, no power plants in Myanmar have yet obtained an ECC due to the backlog of applications being processed by MONREC.



reliability and performance tests, issuing certificates and calculating LD, and to assist EPGE in providing additional documentation to MONREC for obtaining the ECC. EPGE must also update STEP to reflect the status of other activities such as goods contracts that have reached completion status since the last mission.

## B. Rationale for Restructuring

9. Restructuring is required to extend the closing date in accordance with the Myanmar Government's request and to adjust certain results indicators to reflect the delay in full operation of the Thaton CCGT power plant.

10. *Closing date.* The Ministry of Planning and Finance has requested a five-month extension of the Project closing date to March 31, 2020.<sup>4</sup> The closing date has previously been extended twice for a total of 18 months to accommodate earlier delays in procurement and construction as well as prior technical problems with gas supply, plant equipment and associated items.<sup>5</sup> The proposed third extension would bring the cumulative extension to total 23 months from the original closing date. This timing accommodates the time expected for full commissioning of the new power plant under Component 1 of the Project by January 2019 plus a margin of some two months. The extended closing date will also facilitate completion of TA and advisory services under Component 2, including consulting assignments to support EPGE's responsibilities for a short period of operation after commissioning of the new plant. EPGE and CEEC have agreed arrangements and actions to achieve full operation according to the latest schedule and to effectively maintain operations thereafter. The target value for power output from the plant, based on a 12-month projection, is expected to be met or exceeded once the plant begins commercial operation. The ongoing involvement of the reputable international supplier of the main affected parts, and positive current progress at site, provide a basis for confidence that remaining activities will be executed satisfactorily to achieve expected outcomes before the proposed new closing date of March 31, 2020. In accordance with Bank Directives regarding a change in closing date, the team confirms that the PDO remains achievable, the implementing agency's performance is satisfactory, and the Bank and implementing agency have agreed actions that the implementing agency will undertake to complete the Project. EPGE, its Owner's Engineer consultant, the DSI contractor, and the World Bank team, are closely monitoring the schedule of progress for construction of the new plant, and have agreed measures to ensure timely implementation of associated TA.

11. *Results framework.* Three results framework indicators associated with Component 1 are proposed to be updated to reflect the new expected date of full commissioning of the plant and extended closing date. Full details of proposed changes are provided in Section II below. Other targets have already been achieved.

## II. DESCRIPTION OF PROPOSED CHANGES

- (i) **Loan closing date** extension by five months from October 31, 2019 to March 31, 2020.
- (ii) Revisions to the **Result Framework**. For the PDO Indicators "Projected energy or fuel savings", "Increase in electricity generation (annual)", and "Increase of thermal efficiency of energy conversion", the respective

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<sup>4</sup> Letter October 10, 2019.

<sup>5</sup> The Project has undergone three restructurings to date: first in December 2016, to reflect a change in the relevant agencies; second in January 2018 to extend the closing date by 12 months from April 30, 2018 to April 30, 2019; and third in April 2019 to extend the closing date by 6 months to October 31, 2019.



end target dates are updated from April 30, 2019 to March 31, 2020 to reflect the new expected date of full commissioning of the plant and the extended closing date. Actual values at completion will be based on data from plant operation up to that point. End target values are unchanged.<sup>6</sup>

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<sup>6</sup> For the PDO Indicator “Projected energy or fuel savings”, while the target value is sensitive to the date of full operation of plant, it is unchanged given that there remains only a limited period of project implementation and disbursements before closing.



### III. SUMMARY OF CHANGES

	Changed	Not Changed
Results Framework	✓	
Loan Closing Date(s)	✓	
Implementing Agency		✓
DDO Status		✓
Project's Development Objectives		✓
Components and Cost		✓
Cancellations Proposed		✓
Reallocation between Disbursement Categories		✓
Disbursements Arrangements		✓
Disbursement Estimates		✓
Overall Risk Rating		✓
Safeguard Policies Triggered		✓
EA category		✓
Legal Covenants		✓
Institutional Arrangements		✓
Financial Management		✓
Procurement		✓
Implementation Schedule		✓
Other Change(s)		✓
Economic and Financial Analysis		✓
Technical Analysis		✓
Social Analysis		✓
Environmental Analysis		✓

### IV. DETAILED CHANGE(S)



**LOAN CLOSING DATE(S)**

<b>Ln/Cr/Tf</b>	<b>Status</b>	<b>Original Closing</b>	<b>Revised Closing(s)</b>	<b>Proposed Closing</b>	<b>Proposed Deadline for Withdrawal Applications</b>
IDA-53060	Effective	30-Apr-2018	30-Apr-2019, 30-Oct-2019	31-Mar-2020	31-Jul-2020



**Results framework**

**COUNTRY:** Myanmar  
Electric Power Project

**Project Development Objectives(s)**

Increase the capacity and efficiency of gas-fired power generation in Myanmar and strengthen the institutional capacity of relevant agencies.

**Project Development Objective Indicators by Objectives/ Outcomes**

Indicator Name	DLI	Baseline	End Target
<b>Increase the capacity and efficiency of gas-fired power generation in Myanmar</b>			
Generation capacity of energy constructed or rehabilitated (CRI, Megawatt)		0.00	106.00
Thermal (conventional) power generation capacity constructed under the project (CRI, Megawatt)		0.00	106.00
Projected energy or fuel savings (CRI, Mega Joules (MJ))		0.00	3,900.00
<b>Action: This indicator has been Revised</b>	<b>Rationale:</b> <b>End target date updated from April 30, 2019 to March 31, 2020 to reflect the new expected date of full commissioning of the plant and the extended closing date.</b>		
Increase in electricity generation (annual) (Gigawatt-hour (GWh))		260.00	770.00
<b>Action: This indicator has been Revised</b>	<b>Rationale:</b> <b>End target date updated from April 30, 2019 to March 31, 2020 to reflect the new expected date of full commissioning of the plant and the extended closing date</b>		
Increase of thermal efficiency of energy conversion (Percentage)		20.00	48.00



Indicator Name	DLI	Baseline	End Target
<b>Action: This indicator has been Revised</b>			
<i>Rationale:</i> <i>End target date updated from April 30, 2019 to March 31, 2020 to reflect the new expected date of full commissioning of the plant and the extended closing date.</i>			
<b>Strengthen the institutional capacity of relevant agencies</b>			
National Electrification Plan (Text)		No plan	NEP under implementation
Participants of training and capacity building activities from relevant agencies (Number)		0.00	40.00

### Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	End Target
<b>1. Combined Cycle Gas Turbine (CCGT) Power Plant</b>			
Construction Progress (Percentage)		0.00	100.00
Actual cost vs cost estimates (overruns if >100%) (Percentage)		0.00	100.00
Reduction of CO2 emissions per output generated (gCO2eq/kWh) (Number)		0.00	400.00
<b>2. Technical Assistance and Advisory Services</b>			
Feedback mechanism in place for citizens affected by the Project, and the relevant agency reports on if/how feedback has been used. (Text)		Nil	Mechanism in place and reports published every six months.
Public consultations are sensitive to gender: Percentage of women participants is more than 50% on average. (Yes/No)		No	Yes



**The World Bank**

Electric Power Project (P143988)

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