



1. Project Data

Project ID

P143988

Project Name

Myanmar-Electric Power Project

Country

Myanmar

Practice Area(Lead)

Energy & Extractives

L/C/TF Number(s)

IDA-53060

Closing Date (Original)

30-Apr-2018

Total Project Cost (USD)

114,314,218.53

Bank Approval Date

24-Sep-2013

Closing Date (Actual)

31-Mar-2020

IBRD/IDA (USD)
Grants (USD)

Original Commitment

140,000,000.00

0.00

Revised Commitment

123,956,259.72

0.00

Actual

114,314,218.53

0.00

Prepared by

Dileep M. Wagle

Reviewed by

Fernando Manibog

ICR Review Coordinator

Ramachandra Jammi

Group

IEGSD (Unit 4)

2. Project Objectives and Components

a. Objectives

Original PDO: The objective of the Project, as stated in the Financing Agreement (p.5), was “to increase capacity and efficiency of gas-fired power generation and strengthen the institutional capacity of the Ministry of Electric Power and the Myanmar Electric Power Enterprise”.

The project objective, as stated in the PAD (p.7), was identical to the above.



Revised PDO: The PDO was modified at restructuring in December, 2016, to read: "to increase capacity and efficiency of gas-fired power generation and strengthen institutional capacity of relevant agencies" (See Section 2e, below).

****Note:** This IEG report and document review took place between December 1, 2020 and January 22, 2021. Any recent changes to the outcomes and achievements of the project are beyond the scope of this completion report review. ******

b. Were the project objectives/key associated outcome targets revised during implementation?

No

c. Will a split evaluation be undertaken?

No

d. Components

Component 1: Combined Cycle Gas Turbine (CCGT) power plant (cost at appraisal: US\$130 million; actual at completion US\$107.5 million)

This included investments for the expansion of the Thaton power station into a new CCGT power plant, through a contract for the design, supply and installation (DSI) and supply of critical parts for Thaton's new gas turbine. The new modern high-efficiency, low emissions CCGT power plant would comprise of two 40 MW gas turbines, one steam turbine of 26 MW, a heat recovery steam generator and air-cooled steam condenser.

Component 2: Technical Assistance (TA) and Advisory Services (US\$10 million; actual at completion US\$6.8 million).

This component provided TA and advisory support to the Ministry of Electric Power (MOEP) and the Myanmar Electric Power Enterprise (MEPE) for:

(a) capacity building for policy making and regulation in the power sector, including, *inter alia*, (i) development of a National Electrification Plan (NEP), (ii) financial analysis and forecasting for electricity enterprises, (iii) economic evaluation for natural gas in the domestic market, and (iv) review of electricity tariff and review mechanisms, and

(b) capacity building for project implementation, including *inter alia* (i) provision of engineering services for the CCGT, (ii) strengthening of procurement, environmental and social safeguards, and financial management capacity; and (iii) implementation of the Environmental and Social Management Plan (ESMP) at the project site.

e. Comments on Project Cost, Financing, Borrower Contribution, and Dates

Project Cost: The original estimated project cost was US\$140 million. Actual cost at project completion was US\$116.9 million.



Financing: The project's cost was financed through an IDA credit of US\$140 million. Financing of the TA component included US\$2.61 million in World Bank-executed Trust Fund grants, mobilized during implementation on account of the Government's preference to minimize use of IDA funds for TA. The total amount was lower than anticipated because savings accrued after one major study (on tariffs) was dropped during implementation, as the Government was able to secure UK grant funding for that activity.

Borrower Contribution: There was no Borrower contribution to the project's financing.

Dates: The closing date for the original loan was April 30, 2018. The closing date was extended three times to a total of 23 months. The final extension was to March 31, 2020, and the project closed on schedule at that time.

Restructurings: The project went through five Level 2 restructurings, in December 2016, December 2017, April 2019, October 2019 and March 2020, respectively. The December 2016 restructuring was necessary to change the references to MOEP and MEPE in the Financing Agreement, to reflect the reorganization of ministries and state-owned enterprises at the time. The next three restructurings extended the closing date of the project, to reflect delays in implementation, as well as an updating (December 2017) of the legal covenant associated with safeguard instruments, to reflect a triggering of the resettlement policy. The final restructuring made a change in the audit submission period, applicable to all World Bank operations in Myanmar.

3. Relevance of Objectives

Rationale

Rationale

Country and Sector Context:

At the time of appraisal in 2013, Myanmar was a least developing country emerging from a period of political and economic repression. The population had a GDP estimated at US\$900 per capita, with 26 percent living in poverty. In 2011, the country began a process of economic transformation, with a reformist government ushering in unprecedented economic and political reforms aimed at opening up the country to the global economy, boosting growth and reducing poverty. According to the PAD (p.1), by 2013, Myanmar was in the process of undergoing a triple transition, from an authoritarian military system to democratic governance, from a centrally-directed economy to market-oriented reforms, and from 60 years of conflict to peace in the border areas. The government had set economic reform as a key priority, and initial reforms – aimed at reducing economic distortions – such as floating the currency and stimulating foreign direct investment had positive results, with growth accelerating to 6.5 percent in 2012-13, driven by gas production, construction and services. The government recognized however that expanding the quality of basic infrastructure and improving access to modern energy in an efficient and sustainable manner would be crucial to achieving sustainable economic growth and poverty reduction.

Despite substantial endowments, Myanmar's energy sector was characterized by extremely low levels of access to electricity and inadequate supply and quality of electricity generated. Myanmar had one of the lowest rates of electrification in Southeast Asia, with only 29 percent of households in the country having



access to electricity, and with per capita consumption among the lowest in the world. Per capita consumption of electricity in Myanmar, at about 160 kWh, was twenty times less than the world average (PAD, p.1). Total installed capacity was only 3,133 MW, 2,300 MW of which was hydro-based (ICR, p.5). However, because of seasonal variations in water availability and the poor condition of many plants, firm capacity was of the order of only 1,082 MW. During the dry season, forced load shedding meant that up to 30 percent of demand could be unmet. With energy demand projected to increase in keeping with economic growth, this deficit was likely to widen in the years to come.

Natural gas was an important source of baseload power to balance seasonal hydropower, but was being used inefficiently at the time. With 11.8 trillion cubic feet of proven gas reserves, 86 percent of Myanmar's gas production was being exported to Thailand, constituting the country's most important source of export revenues. The remaining gas met only about half the domestic demand, though new offshore fields were expected to start functioning in 2013-14. Most of the country's gas-fired power plants were aged and operating at very low efficiency (only around 20 percent thermal efficiency). Given the slow pace of development of additional hydropower, improving the efficiency of gas-fired thermal plants through upgrades and new technology represented the most rapid and cost-efficient way to expand electricity generation from available gas allocations. Towards this end, the Government planned to increase gas-fired generation capacity through a variety of means, including public sector investment, private sector IPPs and rental power plants.

Alignment with Strategy: The project was the first IDA financing after World Bank re-engagement in Myanmar after more than two decades of absence, and was considered a cornerstone of the Bank Group's program in the energy sector (PAD, p.6). The program aimed to alleviate the acute energy shortages that prevailed in the country at the time, and to set the power sector on a sustainable development path. As such, the project's development objectives were highly relevant at appraisal, consistent with the engagement priorities for the country, and remained so at project closing. The project was consistent with the priorities outlined in the Bank's *Interim Strategy Note* (ISN), 2012, especially Pillar II, which focused on building confidence in the ongoing reform process and Pillar III, which focused on paving the way for resumption of a full country program. It was also closely aligned with the Bank Group's Country Partnership Framework (CPF) for Myanmar, FY15-17 (which was extended to June 2019, and remained the latest strategy document at project closing). The PDO was aligned with Focus Area 1, which was aimed at "Reducing Rural Poverty", and its Objective 1.1 of 'Improved power generation and access to electricity' – which addressed both the delivery of electricity services to people and expanded conventional/renewable power generation (CPF, p.31). Under this objective, the Government of Myanmar aimed to achieve universal access to electricity by 2030. Towards this end it was developing a National Electrification Plan to establish an enabling policy and institutional framework for a nationwide electrification program, to which the Electric Power Project was expected to significantly contribute. The project's objectives were also consistent with the 2019 Systematic Country Diagnostic (SCD), that reiterated the current-day significance of CPF objectives, as highlighted in Priority Area 1.4, Policy Action 1: "Accelerate delivery of quality electricity services to reach all people in Myanmar by 2030". The SCD also underlined the need for public institutions to be reformed and made more effective, so as to pursue this broad and challenging agenda.

The project's objectives were fully consistent with the Government's national development goals, as outlined in the Myanmar Sustainable Development Plan for 2018–2030, particularly with Pillar 2, Strategy 3.6, 'Building priority infrastructure to facilitate sustainable growth and economic diversification', and Pillar 3, Strategy 5.4, 'Providing affordable and reliable energy to populations and industries'. The project's second objective was especially aligned with Strategy 5.4, which emphasized the importance of



energy development plans, electricity tariffs and subsidies, access to electricity and private sector participation for achieving the country's national development goals. Finally, the PDO were consistent with the Government's plan to maintain low-carbon development of the power sector, as outlined in the Myanmar Climate Change Strategy and Master Plan for 2018-2030, which underlined the use of renewable energy in the future.

Given the strong consistency of the project's development objectives with the Government's sector development objectives and their close alignment with the Bank Group's strategy at appraisal and at closing, relevance is rated High.

Rating

High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1

Objective

"To increase capacity and efficiency of gas-fired power generation"

Rationale

Theory of Change:

The project was designed to address two interlinked issues: (a) inadequate and inefficient power supply, and (b) institutional weaknesses. A fairly direct causal link can be drawn between the project's activities and the expected outcomes. The activities consisted of the design, supply and installation of a gas-fired combined cycle plant, and associated infrastructure, which would increase the power station's efficiency, to produce more power from the station's existing allocation of gas. Secondly, the provision of technical assistance and advisory services, via analytics, training and capacity building activities would help beneficiary agencies to develop appropriate policies and regulations for the power sector. Expected outputs would take the form of increased power generation capacity, increased generation and improved thermal efficiency of energy conversion on account of the CCGT plant, on the one hand, and operational support through provision of consultants, delivery of analytic work on tariffs and on the economic value of natural gas, and support for the preparation of a draft National Electrification Plan. Higher-level outcomes included achieving more efficient generation and strengthened institutional capacity of relevant agencies. Longer-term outcomes in the form of stimulus to the achievement of system-wide efficient, reliable and low-cost generation and a more financially and environmentally sustainable institutional environment were expected, though it is difficult to say whether these activities, in aggregate, would be of adequate scale to create a critical mass for change. The project's contribution to these impacts in any case rested on the assumption that MOEP and MEPE would effectively apply their enhanced institutional capacities to sector policies, planning and operations.



Key indicators for both sets of issues were relevant, attributable and adequate to cover measurement of the objectives.

Outputs:

The following outputs were achieved:

- (a) The Combined Cycle Gas Turbine (CCGT) plant was fully constructed, thereby achieving the target value.
- (b) Construction of the CCGT plant was completed at lower than estimated cost. Actual costs for design, supply and installation of the 106 MW plant and supply of critical parts for the Thaton new gas turbine were originally estimated at US\$130 million. As a result of successful procurement, the total contract amount was US\$115.7 million, for 119 MW plus work to extend the adjacent Thaton substation, while actual costs worked out to an even lower US\$104.8 million, on account of liquidated damages from delays in completion of the contract. The package of gas turbine parts and products, including expenses, cost an additional US\$3.37 million.
- (c) Reduction of CO₂ emissions per output generated (by 30 November 2018) was of the order of 400 gCO₂eq/kWh – fully on target.

Outcomes:

The project fully achieved its objective of increasing the capacity and efficiency of gas-fired power generation.

The capacity and efficiency of the Thaton power plant were successfully increased as a result of the project's investment, exceeding key indicator target values – though target dates had to be revised to account for the extended implementation period. By close of project, the generation capacity of 119 MW constructed under the project exceeded the target value of 106 MW by 12 percent.

Actual value of power generation, at 831 GWh, was estimated to exceed the target value of 770 GWh per year by about 8 percent, on the basis of actual data for the first five months of 2020. Projected energy savings by close of project were of the order of 3,900 Mega Joules (MJ), which was fully on target. The increase in thermal efficiency of energy conversion resulting from the CCGT plant was 50.1 percent, as indicated by a Performance Test Report, January 2020. This exceeded the indicator target of 48 percent (by 4 percent). As such, the project's activities recorded better results than anticipated. The plant was designed with better parameters than initially anticipated, which allowed the installation of higher-capacity units within the same site. At the same time, the DSI-type contract and competitive procurement allowed the selection of the best technical solution.

A collateral benefit of the project was that the investment indirectly supported improved efficiency of other gas-fired generation in Myanmar. The project financed parts and products for eight other existing gas-fired power stations in the country to strengthen their reliability, as well as TA for improved dispatch of Myanmar's power plant fleet, as described under Objective 2, below.

Based on the above, the achievement of this objective is rated High.



Rating
High

OBJECTIVE 2

Objective

“Strengthen the institutional capacity of relevant agencies”

Rationale

Outputs:

Institutional capacity for power sector policy, planning and operation was strengthened through TA activities with a focus on least-cost electrification and sector financial viability. With energy access as a strategic policy priority for Myanmar, the development of the National Electrification Plan (NEP) was key to achieving this development outcome. The project provided the vehicle for the Bank to engage with relevant agencies responsible for grid extension to new communities and off-grid systems through upstream policy dialogue and analytic & advisory work, and ultimately to establish and ultimately implement the NEP.

(a) Development of the NEP: The key output of a “Least-Cost Geospatial Electrification Plan” and a “Roadmap and Investment Prospectus” was completed in August 2014. The output provided the foundation for MOEP, the distribution utilities and the Department of Rural development (DRD) to pursue nationwide electrification in a coordinated, least-cost manner for the first time. Planning for the sector in this manner would support financial sustainability and provide the basis to attract private sector participation.

(b) Myanmar Sustainable Energy For All (SE4ALL) consultations: This activity facilitated engagement of national and international stakeholders to develop a coordination platform for universal energy access under the NEP. The activity, completed in September 2014, was an initial contribution to broader SE4ALL program of TA for Myanmar.

(c) Poverty & Social Impact Analysis (PSIA) for NEP: This provided an important complement to the NEP, by identifying barriers to electricity access, especially among vulnerable households. The study, conducted in 2015, included data from 24 villages, 14 urban wards and industrial zones/enterprises, and identified impacts of possible increases in electricity tariffs on poor and vulnerable customers, and recommended mitigative measures. Supplemented by later household surveys and analyses (funded outside the project), this underpinned successful electricity tariff reforms in 2019 and design of mechanisms to ensure inclusive electrification of the poorest households in grid-connected communities, under the NEP.

The capacity of relevant agencies for policy-making and regulation was strengthened through completion of the following activities:

(i) Power sector financial analysis and viability action plan: This activity contributed to the formulation of a cost-recovering tariff, increased the institutional capacity of enterprises in Myanmar’s power sector to undertake forward-looking financial analysis, and helped define a benchmark PPA price for new IPPs.

(ii) Economic value of natural gas for domestic use: This study increased knowledge in assessing the economic cost of supplying natural gas for domestic consumption and strengthened capacity in finding solutions to the rising domestic demand for natural gas. The output helped inform decision-making on how to



balance gas export and domestic consumption, develop a gas pricing policy and reduce subsidies for domestic gas consumption. Gas prices were in fact revised, following this TA.

(iii) Modelling and training in economic dispatch: This activity strengthened the institutional capacity in dispatch and optimization modelling, thereby enabling the introduction of more efficient dispatching practices of the entire power system. The application of the knowledge acquired contributed to the reduction in load shedding. More optimized dispatch would not only lead to system-wide benefits, with benefits to other power plants such as variable renewable energy plants, which gas-fired generation can help balance.

(iv) Technical feasibility study and Environmental & Social Impact Analysis (ESIA) for upgrading Ywama gas-fired power station: These activities informed the design of the rehabilitation of the Ywama plant, including technical, financial, social and environmental aspects. These studies ensured the completion of the ESIA and were instrumental in preparation of the Power System Efficiency and Resilience project (P162151), approved in May, 2020.

Outcomes:

As a result of activities supported by the project, institutional capacity for project implementation of relevant agencies was strengthened. Some 60 participants from relevant agencies received training in safeguards, procurement, financial analysis, financial management and plant operation, in addition to capacity-building support, through 16 training sessions conducted over 200 days between 2014 and 2018. The target (of 40 participants) for the first outcome-level results indicator was exceeded by 50 percent.

Training was expanded to accommodate the clients' needs, which contributed to delivery of greater results (ICR, p.15). Over time the training plan was made more customized by the World Bank to provide a more tailored focus on project implementation. According to the ICR (para 34), there was evidence that knowledge and skills acquired through these trainings were in fact applied by the implementing agencies during project implementation. Financial management reports submitted over the course of the project by the implementing agency, for instance, improved in quality over the period. Similarly, the implementing agency improved its ability to identify and report risks relating to fiduciary non-compliance, or for instance in application of social safeguards.

The second outcome-level results indicator – of bringing the NEP to implementation was also achieved. Completion of the NEP was achieved in 2016, one year ahead of schedule, with high attribution to the project (ICR, p.20). Implementation of the NEP by the Government commenced in 2015, through the National Electrification Project, the Financing Agreement of which was signed in October 2015.

At a broader level, the project contributed to the operational efficiency of the Electric Power Generation Enterprise (EPGE), increasing its knowledge and ability to monitor other gas-fired plants, and to design and implement new projects more successfully (ICR, para 35). Hands-on training provided by the DSI firm China Engineering Corporation (CEEC) on the Thaton plant's operation strengthened the capacity of the staff to operate and maintain the GE Frame 6 gas turbines, which were in use in two other plants in Myanmar besides Thaton, without the help of foreign engineers. The project also helped strengthen EPGE's capacity in setting energy conversion efficiency norms, to set efficiency targets for potential new IPP gas-fired plants. In this context, EPGE was able to develop a monitoring mechanism to prevent technical issues from occurring in the future. Finally, EPGE acquired significant experience in contract execution and ensuring compliance of contractors and sub-contractors with legal and commercial responsibilities. Towards the end of the project's implementation period, EPGE staff demonstrated their ability to independently negotiate and resolve



contractual issues such as liquidated damages.

Based on the above, achievement of this objective is rated High.

Rating

High

OVERALL EFFICACY

Rationale

The project fully achieved its objectives of increasing the capacity and efficiency of gas-fired power generation, and of strengthening the institutional capacity of relevant agencies. In addition, it should be mentioned that the introduction of the NEP, financed under the project, laid the groundwork for scaling up future investments in electrification projects. Through implementation of the program, between 2010-11 and 2018-19, the electrification rate doubled and enabled a large rural population to get off-grid access through solar home systems and mini-grids. Secondly, to the extent that the Thaton power plant supplied electricity not only locally to Mon State but also nationally to the power grid, grid customers would have benefited from more reliable power supply. Taking these factors into account, overall efficacy is rated High.

Overall Efficacy Rating

High

5. Efficiency

Economic and Financial Efficiency

Economic analysis of the project conducted at appraisal was based on Component 1. The analysis estimated the Economic Internal Rate of Return (EIRR) at 22.7 percent, and the Net Present Value (NPV), discounted at 10 percent, at US\$142 million. The EIRR estimated at project closing was a somewhat higher 29.1 percent, with NPV of US\$45 .0 million. The improvement in the project's economic viability could be attributed to a higher-than-anticipated thermal efficiency of energy conversion and power generated, coupled with cost savings arising from lower-than-anticipated prices negotiated through international competitive bidding (ICB). Delays in project commissioning did result in a foregone potential benefit of three years compared to the original project timeline; however, these were offset to a significant extent by the liquidated damages that were recovered under the DSI contract. No comprehensive financial analysis of the project was however carried out either at appraisal or at project closing.

Administrative and Operational Efficiency



Actual costs for the project at completion were significantly lower than anticipated: US\$116.9 million as against US\$140 million estimated at appraisal. This reduction took place notwithstanding a delay of nearly three years in construction and commissioning of the plant on account of delays in selection of international consultants (including international procurement specialist, international financial management specialist, and owner's engineer, among others), arising from lengthy procurement processes, attributable to a low procurement capacity and burdensome approval procedures. Delays were also on account of unanticipated logistical difficulties with the delivery of heavy equipment over road bridges from the nearest port (requiring the bridges to first be strengthened), and technical issues with turbines and a few other parts (requiring disassembly and dispatch to Singapore for repairs).

The cost savings were achieved through use of international competitive bidding (ICB) procedures, which succeeded in keeping prices low. In addition, liquidated damages arising from the DSI contract largely offset the foregone benefit arising from the delays. Overall, as the ICR indicates (p.21), the project provided a "cost-effective solution to attain identified and measurable benefits". The project's economic efficiency was thus in line with the results anticipated at appraisal, allowing the project to achieve development outcomes with significant savings.

Based on the above, the project's efficiency is rated Substantial.

Efficiency Rating

Substantial

a. If available, enter the Economic Rate of Return (ERR) and/or Financial Rate of Return (FRR) at appraisal and the re-estimated value at evaluation:

	Rate Available?	Point value (%)	*Coverage/Scope (%)
Appraisal	✓	22.70	0 <input checked="" type="checkbox"/> Not Applicable
ICR Estimate	✓	29.10	0 <input checked="" type="checkbox"/> Not Applicable

* Refers to percent of total project cost for which ERR/FRR was calculated.

6. Outcome

The project's objectives were highly relevant to the World Bank Group's ISN (2012) and its Country Partnership Framework (FY15-17, extended to FY19), which was the latest available as at project closing. Overall efficacy was also High, as the project clearly achieved its objectives. Efficiency was found to be Substantial, on account of implementation delays, though these were offset to a substantial degree by cost savings achieved. Taking all of this into account, overall project outcome is rated Highly Satisfactory.

a. Outcome Rating



Highly Satisfactory

7. Risk to Development Outcome

The risk that the development outcomes would not be sustained is Modest.

First, the likelihood that natural gas delivered to the Thaton plant will be of insufficient quantity and pressure is modest (See ICR, p.36). While domestic gas production is expected to decline after 2021., when some natural gas deposits are depleted, according to information provided by MOGE and EPGE, this decline is likely to be offset by a reduction in gas exports.

Second, the risk of the plant's assets not being maintained regularly and adequately is also considered to be modest. Adequate mitigation measures were put in place through the project; for instance, the plant was run for two continuous months before performance test to demonstrate reliability, while project funds were used to procure spare parts for the plant's O&M for a period of two years (in addition to parts being supplied under the contract). In addition, the capacity of EPGE operational staff has been considerably enhanced.

Third, the risk that EPGE's financial position may be weakened, thereby compromising the progress in improving the sector's financial viability, is similarly considered modest. The electricity tariff reform of 2019 resulted in a strengthening of EPGE's financial position, with subsidy requirements having declined (by more than 80 percent in 2019-20, compared to the previous year). The impact of the Covid-19 pandemic is as yet indeterminate, and could call for subsidy requirements to increase once again – but would most likely remain below the pre-tariff reform level.

8. Assessment of Bank Performance

a. Quality-at-Entry

The design of the project benefited from the World Bank's experience in the sector in other countries. Project design was relatively straightforward, separating investments from TA. The design took account of the Government's sector priorities of eliminating gas and electricity shortages, increasing access to modern energy and contributing to the sustainable development of the sector. The brownfield site and technology were selected in collaboration with the client – the location of the existing Thaton plant allowing for a near-doubling of installed capacity of the station without the need to acquire additional land, and its proximity to the main gas pipeline reducing potential exposure to gas shortages.

During preparation, the Bank team collaborated extensively with development partners on the mobilization of grants for TA and capacity-building activities. The team collaborated with the Government of Norway for the preparation of the Thaton CCGT feasibility study, ESA and ESMP, tender documents, technical specifications and support with bid evaluation (these activities being implemented by *Norconsult*, under funding from Norway). Partnership with development partners ensured broad support and buy-in from stakeholders for the project.

Project risks were adequately assessed and appropriate mitigation measures were incorporated. At



appraisal, the following risks were considered substantial: (a) stakeholder risk associated with Myanmar's political transition and uncertainties affecting the operating environment; (b) implementation agency risk stemming from fragmented institutional and regulatory framework, low capacity, complex administrative processes and lack of familiarity with World Bank operations; (c) project risks related to social and environmental safeguards. These risks were addressed and mitigated through intensive implementation support provided by the Bank team and international consultants, delivery of intensive training and capacity building of implementing agencies and their staff.

Implementation arrangements provided were suitable and competent staff across three MEPE/EPGE departments were assigned. To prevent dilution of implementation of investments by politically sensitive policy issues, the design was kept relatively simple, with investments from TA being kept in separate components. Rather than set up a designated unit, implementing agency staff roles were distributed among operational staff of MEPE/EPGE units, so that after project closing the strengthened capacity across units would be applied to other projects. To assist MEPE/EPGE with documentation of policies and procedures, given their lack of experience with donor-funded projects, an Implementation Support Plan was developed to guide the implementing agency.

Quality-at-Entry Rating Satisfactory

b. Quality of supervision

The project appears to have been adequately supervised, with fourteen supervision missions over seven years. The ICR reports (p.34) that the Bank team, supported by staff from the country office, maintained an active and continuous dialogue with the client, which helped build trust in the relationship. The Bank team consisted of experienced task team leaders (TTLs) over the implementation period, with team members with experience of all of the key areas relevant to project implementation (safeguards, procurement, financial management, etc.). The team's experience and support proved invaluable to solving critical implementation bottlenecks, especially relating to the contracting of international consultants.

The ICR also reports that supervision was intensive and thorough, as reflected in frequent rating changes and timely restructures. The team was also able to identify early on the need to modify the Results Framework or extend the closing date to ensure the project stayed on track to achieve its developmental objectives. These frequent rating changes also prompted the client to take action, for instance when compliance with legal covenants was lagging. At the same time task team members made themselves available to provide ongoing intensive support, as needed and requested by the implementing agency.

The Bank team was able to transfer knowledge through training activities and workshops, and hands-on operational support (ICR, p.35). When – during the early years of implementation – the limited capacity of the implementing agency became apparent, the team expanded the training plan to offer a wider range of tailored and in-depth trainings on project implementation, in such areas as financial analysis and plant operation. The team also held discussions on the potential use of savings with the ministry and MEPE/EPGE at high level and at working levels several times during implementation. This led to the stockpiling of spare parts for the Thaton plant to cover the first two years of operation, preparatory studies



for the new Ywama project (approved in FY20), purchase of efficient equipment for several other gas-fired power plants and several trust-funded TA activities.

Quality of Supervision Rating

Satisfactory

Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The design of the M&E system was fairly clear and practical. Key results indicators were consistent with the theory of change and relatively easy to monitor. Assumptions underpinning technical indicators were determined on the basis of feasibility studies and technical parameters provided by the client. Target values were set at realistic levels, though it could be argued that the time frame for achieving the first developmental objective was somewhat ambitious. Also, that one or two of the indicators for the second objective could potentially have been better designed to capture the benefits of strengthened capacity for project implementation & policy and regulatory reform (ICR, p.28). For instance, the value of the indicator: "Participants of training and capacity building activities from relevant agencies" included training provided on fiduciary issues (procurement, financial management, safeguards, financial analysis) and plant operations but did not include workshops on capacity building activities on policy and regulatory reform, thereby missing out on capturing the effects on other project activities, such as the economic value of gas and PSIA studies building on the capacity of the relevant agencies.

b. M&E Implementation

M&E was managed satisfactorily, with extensive support provided by the World Bank team and refinements to the results framework made as needed. Though the capacity of the implementing entity was limited at first, regular reporting allowed monitoring of progress of activities. Data on project implementation and outputs were provided by the implementing agencies in periodic progress reports to the World Bank. On account of the capacity limitations of implementing agency staff, staff on the Bank team initially had to undertake data analysis to measure progress on indicators. However, over time EPGE staff became sufficiently trained in data analysis to undertake the work themselves, and were able to demonstrate improved ability to provide more accurate data and capacity to take on more M&E responsibilities.

c. M&E Utilization

Data collected for M&E were used by the implementing agency to monitor the status of the project. Data on performance and results progress were used to inform project management and decision-making –



as evidenced by the frequent revision of target dates for achieving outcomes of Component 1 to reflect the updated completion schedule of the Thaton plant.

M&E Quality Rating

Substantial

10. Other Issues

a. Safeguards

The project was classified as Environmental Category B, with Environmental Assessment (OP/BP 4.01) and Indigenous Peoples (OP/BP 4.10) policies triggered. Due to lack of safeguards and operational procedures for workers' health and safety and environmental good practices, it was required that the World Bank's EHS (Environment, Health and Safety) guidelines and Guidelines for Thermal Power Generation be applied to the project. An ESIA was undertaken, as required, during project preparation and an ESMP prepared and adopted by MEPE.

Though the project did not trigger safeguard policy OP 4.12 on Involuntary Resettlement at appraisal, this was triggered with the updated design of the new Thaton plant that required additional infrastructure for supply of water from a nearby river to the plant and for the housing of workers near the plant: these additional works called for acquisition of new land and removal of trees. In response, the implementing entity developed an ARAP (Abbreviated Resettlement Action Plan) and EMP, plus a labor influx rapid risk assessment undertaken in April 2017, which found that there were no grounds to amend the risk assessment.

The ICR reports (p.30) that the safeguards rating was Satisfactory at project closing for both environmental and social safeguards. The project complied with all safeguards policies triggered throughout the implementation cycle. Safeguards measures were built into the Thaton plant contract. Environmental monitoring of contractors' performance was carried out as required. Reports on safeguards compliance were periodically submitted to the World Bank for review and any issues relating to contractors' performance were always addressed.

All social safeguards instruments were completed and there were no pending issues. The implementing entity is reported (ICR, p. 31) to have implemented the mitigation measures and consultations were conducted with affected households. All households affected by works that required acquisition of land and removal of trees were compensated. A Grievance Redress Mechanism (GRM) was put in place to record any grievances by villagers and local communities.

Despite low institutional capacity, the client was committed to regular monitoring of compliance with safeguard instruments. An international safeguards consultant, plus environmental and social safeguards specialists from the Bank team, provided ongoing support to the implementing entity. The client complied with the establishment of a dedicated Environmental and Social Management Unit in early 2018. The strengthened capacity and enhanced knowledge of safeguards acquired through the operation is expected to be applied to other projects, including the recently-approved Ywama project.



b. Fiduciary Compliance

Financial Management (FM): The project's financial management (FM) was rated Satisfactory, at project closing. Barring some minor issues during the first years of implementation, the ICR reports (p. 32) that the project's FM function performed satisfactorily and was in compliance with the World Bank's FM policies and procedures. MEPE/EPGE's Budgeting & Financial Management Unit was responsible for budget preparation, financial reporting and auditing, contract and expenditures management, expenditures verification and accounting records maintenance, and also for managing the Designated Account for IDA funds. To strengthen EPGE's FM capacity, a qualified financial management consultant was initially engaged to assist with project implementation, but due to dissatisfaction with the consultant's performance, the contract was terminated. The Bank team however continued to support EPGE to manage financial matters. Financial statements submitted annually by EPGE to the Bank were audited by an independent firm each year. Reports were of acceptable quality and submitted to the Bank in accordance with the Financing Agreement. All five legal covenants were met at project close.

Procurement: Procurement compliance was also considered to be Satisfactory at project close, despite repeated downgrades in earlier years, as a result of the lack of dedicated procurement staff for the project and slow progress with other TA contracts. Procurement performance improved in the later years of project implementation, once a full-time, dedicated procurement officer was assigned to exclusively handle project-related matters.

c. Unintended impacts (Positive or Negative)

d. Other

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Highly Satisfactory	Highly Satisfactory	
Bank Performance	Satisfactory	Satisfactory	
Quality of M&E	Substantial	Substantial	
Quality of ICR	---	Substantial	

12. Lessons

IEG derives the following lessons drawn from the ICR:

1. It is critical to build capacity of key sector stakeholders, to avoid delays taking place in



procurement decisions, especially for countries affected by fragility, conflict and violence (FCV). To bridge the gap, introduction of skilled international technical experts to support staff of the implementing entity should be considered at an early stage of implementation. Since FCV countries can be expected to have limited experience with large procurement packages and limited familiarity with the World Bank's procurement framework, they can benefit from the Bank's recently-introduced procurement hands-on extended implementation support (HEIS) for fragile countries, which could help reduce delays and would ensure the integrity of the procurement process.

2. Effective risk mitigation and troubleshooting mechanisms need to be put in place and preferably built into contract provisions, including for post-completion operation of assets. For complex projects and for clients with low capacity, World Bank teams can help by setting up mechanisms to identify and resolve contract implementation issues early on in the process. To further reduce risks, the inclusion of an O&M contract in the project's costs can pay dividends by guaranteeing proper performance and efficiency of operation over the lifetime of the plant and equipment.

3. Projects are more likely to succeed if greater focus is placed on critical policy reforms. The project was designed to respond to the Government's priority to increase access to electricity, and its TA activities were intended to build a solid foundation for the policy reform needed to achieve the objective. With the focus on the development of an NEP and improvements to the financial viability of sector, the project demonstrated high buy-in from the Government that had implications for all other project activities as well. The fact that Government's reform priorities were at the core of the operation sent a strong signal to stakeholders and ensured Government's support in solving implementation bottlenecks throughout the project.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The ICR is clearly written, concise and consistent with guidelines. It provides good details of the project's activities. Its analysis and lessons are evidence-based and internally consistent. The analysis of project performance and efficiency is results oriented, based on the foundation of a well-articulated theory of change, and contains a clear narrative. Adequate detail is provided on the context of the project and the implementation issues it faced, as well as on the Bank's approach to design and oversight. This is similarly true of the discussion of compliance with fiduciary requirements. Overall, the ICR is of good quality.

a. Quality of ICR Rating

Substantial

