



## 1. Project Data

<b>Project ID</b> P101578	<b>Project Name</b> PG - Energy Sector Development Project	
<b>Country</b> Papua New Guinea	<b>Practice Area(Lead)</b> Energy & Extractives	
<b>L/C/TF Number(s)</b> IDA-52010	<b>Closing Date (Original)</b> 31-Jan-2018	<b>Total Project Cost (USD)</b> 6,381,153.08
<b>Bank Approval Date</b> 21-Feb-2013	<b>Closing Date (Actual)</b> 31-Jul-2019	
	<b>IBRD/IDA (USD)</b>	<b>Grants (USD)</b>
Original Commitment	7,300,000.00	0.00
Revised Commitment	7,300,000.00	0.00
Actual	6,381,153.08	0.00

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## 2. Project Objectives and Components

### a. Objectives

As stated in the Financing Agreement on page 6 and in the PAD on page 10, the objectives of the project were to (i) strengthen policy development and strategic framework for renewable energy and rural electrification; and (ii) attract investors for sustainable development of new hydropower generation to supply the Port Moresby electricity grid. The Global Environment Objective (GEO) as stated in the Grant Agreement (p.3) was "to support the development of a framework, information exchange, and consensus building to



launch a national effort on development of renewable energy-based mini-grids and rural electrification". The above-mentioned project development objectives remained unchanged until the project's closure.

In accordance with the Bank's guidance, this review will assess the PDO as defined in the Financing Agreement, and will focus on the efficacy toward the two PDOs as delineated below:

- (i) To strengthen policy development and strategic framework for renewable energy and rural electrification; and
- (ii) To attract investors for sustainable development of new hydropower generation to supply the Port Moresby electricity grid.

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

Yes

**Did the Board approve the revised objectives/key associated outcome targets?**

No

**c. Will a split evaluation be undertaken?**

No

**d. Components**

The project had two components as detailed below:

**Component 1: Institutional and Policy Development for Renewable Energy and Rural Electrification (Cost at appraisal of US\$2.0 million, with US\$0.930 million from IDA, and US\$0.855 million from the Global Environment Facility (GEF); Actual of US\$1.18 million, with US\$0.35 million from IDA, and US\$0.83 million from GEF).**

**Original component:** This component intended to fund three categories of activities supporting: (i) the preparation of a renewable energy policy and a rural electrification policy for the country, (ii) the preparation of a strategic environmental and social assessment of the above policies and a rural electrification strategy, and (iii) the strengthening the capacity of country's institutions, including effective and efficient operational management, procurement and financial management.

**Revised component in 2016:** Changes in the Component 1 included the addition of (i) the preparation of a natural gas master plan, and (ii) the amendment of a project covenant related to the establishment of a panel of experts for the proposed Naoro Brown Project.

**Revised component in 2017:** The revised cost was reduced to US\$1.25 million, including a counterpart financing of US\$0.25 million. Key changes included: (i) the cancelation of the development of a renewable energy policy and a rural electrification policy and replacement by the development of a national energy policy, (ii) the support to the strategic environmental and social assessment in the context of the rural electrification strategy instead of the energy policy development; (iii) the cancellation of the development of the natural gas master plan, and (iv) the removal of the support for the Department of Petroleum and Energy (DPE) regional offices.



**Component 2: Technical Assistance for Preparation and Planning for Port Moresby Hydropower Supply (Cost at appraisal of US\$5.740 million, with US\$5.740 million from IDA, with actual of US\$6.3 million from IDA).** Key activities that were to be funded by this component included (i) the preparation of the Naoro Brown Hydropower Project for Port Moresby, and (ii) the completion of an improved planning related to hydropower supply for Port Moresby.

**Revised component in 2017:** Changes included three cancelations of the project's support to (i) the Dam Safety Expert Panel, (ii) the selection of the Naoro Brown Project Developer through financial close, and (iii) the three-basin inventory study of the Brown, Vanapa and Angabanga Basins.

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

**Project Cost.** At project closing, the actual project cost amounted to US\$7.21 million. At appraisal, the project cost was estimated at US\$9.25 million.

**Financing.** At appraisal, the project financing was estimated at US\$7.3 million from an IDA credit and US\$0.9 million from a GEF grant. At project closing, actual disbursements amounted to US\$6.38 million from the IDA credit and US\$0.83 million the GEF grant.

**Borrower Contribution.** At appraisal, the borrower's contribution was estimated at US\$1.2 million; but there was no actual contribution from the borrower, reflecting both Government's budget constraints and financial issues within the energy utility, and limited Government's commitment.

**Restructurings:** There were two project restructurings.

- **First Restructuring (Level 2-June 29, 2016):** This restructuring was prompted by the need to extend the project implementation by 18 months to catch up with the accumulated delays and to implement the revised activities under Component 1 as detailed under Section 2.d above.
- **Second Restructuring (Level 2-August 15, 2017):** This restructuring arose from the need to reallocate project resources to incorporate the reconfiguration of project activities, and the changes in the evolving project costs.

**Dates:** The project was approved on February 2, 2013 and became effective on November 27, 2013. The Midterm Review was completed on November 30, 2015. The project closed on July 31, 2019, 18 months after the original closing date set at appraisal. The reasons for closing date extension have been outlined in the first restructuring entry above.

### 3. Relevance of Objectives

#### Rationale

**Country context:** Despite the country's large hydropower potential and gas deposits, the country's power system largely depended on expensive diesel fuel for power generation, which were being used by private sector developers for power generation at a high cost. The country lacked a comprehensive policy to



address the issues, and this factor was a major reason for designing the project with a policy-oriented component to provide a framework for subsequent energy planning and development. The WBG has been supporting the Government's ambitious energy sector goals regarding access and renewables, including the provision of : (i) TA to identify least-cost options plan for generation and transmission; (ii) support for mapping renewable energy resources, with a focus on wind; and (iii) technical support on gas negotiations and on gas-to-power options. While the project represented a continuation of the Bank's support in modernizing the country's electricity planning and generation, implementation readiness was insufficient, because of weaknesses in the Government system to swiftly execute identified activities, particularly as regards to the advanced development of a financing stage for a hydroelectric project with PNG Power.

**While the PDOs were in line with the Borrower's national priorities at appraisal, the Government shifted away from the second PDO at project closing.** Because of the low rate of electricity access (about 20 percent), increasing electrification rate was among the top priority goals of the government. To address country's energy challenges, the Government adopted an ambitious goal in the 2017-2027 National Energy Policy document (see pages 1-5), which aimed to "provide sufficient, accessible, reliable and affordable energy in a manner that is competitive, sustainable and environmentally friendly". Several principles of the Policy were in line with the project's PDOs, including the Principles 2 and 4, which respectively intended to "(i) develop an integrated planning process for sustainable energy supply and utilization, and (ii) ensure energy resources are developed and delivered in an environmentally sustainable manner". Moreover, strategies developed under each of the above principles were consistent with the project's activities. However, although the Naoro Brown Hydropower Project was among the least-cost power generation options in 2019, the Government's focus shifted away from hydropower generation toward gas generation.

**The PDOs were consistent with the World Bank's strategies at project closure:** The project was congruent with the 2019-2023 Country Partnership Framework (CPF) which explicitly identified the key focus areas, including supporting people's access to electricity and promoting renewable energy. The CPF Objective 2.4 aimed "to improve planning and operational capacity for achieving government's electrification targets (CPF, page 50-51)". The project pinpointed two categories of activities supporting the strengthening of the country's energy policy, and the development of a project aimed to increase the availability of renewable energy and opportunities for better energy access. Overall, the project objective was aligned with the key pillars of the country's strategy at closing.

Overall, the relevance of objectives was substantial. While PDOs were consistent with the World Bank country's CPF and country needs, there were signals that the Borrower was shifting from hydropower to gas source of electricity at closure, and implementation readiness was insufficient.

## Rating

Substantial

## 4. Achievement of Objectives (Efficacy)



## **OBJECTIVE 1**

### **Objective**

To strengthen policy development and strategic framework for renewable energy and rural electrification.

### **Rationale**

#### **Theory of Change for Objective 1**

The project intended to provide technical assistance to the Department of Petroleum and Energy through the hiring of a renewable and rural energy adviser, strategic environmental and social assessment, and stock-taking using geographic information systems (GIS). The expected outputs of technical assistance were (i) a renewable energy and a rural electrification policy, (ii) a rural electrification strategy, and (iii) increased institutional capacity through training. The outputs would be expected to lay the foundation for a strengthened strategic framework for the development of renewable energy and increasing rural electrification. Expected long-term impact was increased access to clean energy.

While the links between the activities and the expected outcomes were plausible, the project results were at the output level rather than outcome. The short-term goal of the project was to establish a comprehensive policy formulation and strategic framework and strengthen institutional capacity that were absent for the development of large hydropower potential for electricity generation and increasing access to electricity. The project's development impact would be expected to materialize in the medium- to long-term depending on the commitment of the government to implement the policies and strategies developed under the project.

### **Outputs**

- A National Energy Policy (NEP, 2018–2028) and a rural electrification strategy were completed and approved by the Cabinet in 2018, including the next steps for the National Electrification Roll-Out Plan (NEROP) Implementation in 2019;
- A geospatial mapping and investment prospectus were completed under the NEROP, and allowed the determination of the least cost renewable energy based mini-grid concessions for the population living in rural and urban areas;
- The strategic environmental and social assessment was completed and incorporated into the rural electrification strategy; and
- A resource mapping exercise to measure commercial grade wind data and determine alternative renewable energy sources to support the Government's access target was completed.
- The Government officially launched the Energy Policy 2017- 2027 on August 20, 2020, firming its intentions on the carbon free energy generation, especially the renewable resources including hydropower.

### **Outcomes**

- The key contribution of the NEP was to provide an overall panorama of the energy sector and to set forth the foundation for significantly improving the country's access to electricity aimed to attain the 70 percent goal by 2030;
- The completed energy policy and strategy provided a framework for the Government's electrification program toward meeting its access targets and attracted development partners to participate in building consensus for the implementation of NEROP.



Overall, the key achievement was the completion of the National Energy Policy (NEP, 2018–2028), and the preparation of the National Electrification Roll-Out Plan (NEROP) Implementation. The above was a first step toward developing the policies of the country's energy sector. According to the additional information provided by the project team, the PNG government, in October 2020, requested the Bank's support through an International Development Agency credit for the implementation of NEROP to increase access to electricity in the country. This is a positive outcome of the project's intervention that the PNG government now moves to the second stage of the implementation of NEROP prepared under the project. Therefore, the efficacy of the achievement of Objective 1 is rated Substantial.

### **Rating**

Substantial

## **OBJECTIVE 2**

### **Objective**

To attract investors for sustainable development of new hydropower generation to supply the Port Moresby electricity grid

### **Rationale**

#### **Theory of Change for Objective 2**

The key activity was the provision of technical expertise to Papua New Guinea (PNG) for the preparation of a hydropower supply plan for Port Moresby and the development of 80MW Naoro Brown Hydropower Plant Project. Expected outputs were to include (i) project documents, such as power purchase agreement, request for proposal, and environmental and social impact assessment, for the Naoro Brown Hydropower Project; (ii) the three-basin inventory study to prepare a hydropower power supply plan for Port Moresby; and (iii) training for PPL staff. The key expected outcome was the selection of an investor that would undertake a sustainable development of the Naoro Brown Hydropower Plant to increase affordable and reliable electricity supply to Port Moresby grid, and reduce the country's reliance of electricity produced by diesel generators by implementing the hydropower supply plan.

The links between the project activities/outputs and expected outcomes were plausible, and achieving financial closure for the Naoro Brown Hydropower Plant Project to be developed by a private investor was measurable. However, the achievement of this outcome within four years was unrealistic given the lack of institutional capacity of the PNG Power to implement such a complex transaction process, including safeguards aspects, and the various risks that would have to be addressed to achieve a bankable scheme for the development of the hydropower plant by a private investor. According to the results framework in the PAD (p.29), the developer would have been selected by the end of the second year of project implementation, and the financiers' due diligence would have been completed by the end of the fourth year.

### **Outputs**

- The following required studies necessary to provide the necessary documents to initiate a search for potential developers were completed: (i) the draft bidding documents, (ii) the transaction options report; and (iii) the Environment and Social Impact Assessment (ESIA);



- A Panel of Experts report was also completed to provide insight into technical aspects and reduced uncertainty surrounding the development;
- Many staff were trained and gained experience in the preparation of hydropower projects;
- The three-basin study that would form the basis for the hydropower supply plan for the Port Moresby grid was dropped in 2017 because the Government's focus shifted from hydropower development to gas-to-power to utilize the large gas reserves in the country, and funds were insufficient (ICR, p.15); and
- The transaction advisory could not be provided, and some studies, such as hydrology gauging, could not be completed because of insufficient funds.

### **Outcomes**

The achievement of this objective was to be measured by reaching an advanced financing stage for the Naoro Brown Hydropower Project and engaging an investment bank that would select a developer. The above indicator was adequate to capture the achievement of the objective "to attract investors" for the development of new hydropower generation to supply the Port Moresby electricity grid. The three-river basin study that would form the basis for the hydropower supply plan for the Port Moresby area was expected to facilitate the development of future hydropower projects and the selection of investors, assuring the "sustainability" condition of the objective.

While originally the project targeted financial closure for the hydropower project, after the 2017 restructuring, the target was lowered to the preparation of a financing package and its approval by the government. Additionally, as reported in the outputs above, the three-basin study was dropped in 2017. Despite these changes in the project scope and the targets, the project objective was not revised. The approval of the financing package by the government in 2018 does not provide sufficient evidence for the achievement of this objective, because there is uncertainty about the effective development of the project by the government. Additionally, according to the findings of the Least-Cost Power Development Plan, which was financed by the Bank and completed in 2018, the rehabilitation of existing hydropower capacity and development of gas-to-power projects are lower cost options compared to new hydropower development which requires long preparation and development duration (ICR, p.12). As of the writing of this review, the government had already put a hold on the development of hydropower projects to supply electricity to Port Moresby area.

Even if the government decides to move forward with the development of the Naoro Brown Hydropower Plant, as the ICR (p.20) reports, there are outstanding activities to be completed before promoting the project to be developed by private investors, such as hydrology gauging, sediment flow/rainfall equipment and installation, update of project costs for the generation facility and components, access road and cost estimates, sediment tests, transmission corridor surveys and cost estimation, and geotechnical investigations.

Overall, the efficacy of the achievement of this objective is rated negligible for the following reasons: (i) there is no investor selected for the development of the Naoro Brown Hydropower Project; (ii) the development of the hydropower project depends on the preparation of other technically necessary project documents; and (iii) the uncertainty about the future of the project since the government's focus has shifted from new hydropower development toward gas-to-power projects based on the findings of the Least-Cost Power Development Plan.



**Rating**  
 Negligible

**OVERALL EFFICACY**

**Rationale**

The project’s performance in achieving the first objective was substantial. The National Energy Policy was prepared, which forms the foundation for the development of energy sector, including increasing access to electricity under National Electrification Roll-Out Plan (NEROP). The NEROP is expected to move to the second stage, i.e., implementation under a follow-on project to be financed by the Bank.

The achievement of the second objective is rated negligible, because the project was not successful in attracting investors for hydropower development, and additionally, the government’s focus has shifted from new hydropower development to gas-to-power projects and rehabilitation of existing hydropower plants according to the findings of the Least-Cost Power Development Plan.

**Overall Efficacy Rating**  
 Modest

**Primary Reason**  
 Low achievement

**5. Efficiency**

This was a technical assistance project and no economic analysis was prepared at project appraisal. For efficiency analysis, the ICR used a “reasonable cost” approach to compare the project cost to similar projects in the Dominican Republic and Vietnam, combined with a “value-for-money” approach (p.44) to assess the quality of project outputs in relation to the costs incurred (ICR, p.21). Based on these two approaches, the US\$1.18 cost incurred in producing the National Energy Plan (NEP) and National Electrification of Roll-Out Plan (NOREP) against the appraisal estimate of US\$2.0 million was reasonable and the quality of the outputs is evidenced by the decision of the PNG government to move to the second stage of NEROP implementation aimed at increasing access to electricity in the country. The project’s efficiency in strengthening policy development and strategic framework for rural electrification was substantial.

Additionally, the economic benefits of the project were assessed by calculating the expected greenhouse gas (GHG) emissions reduction that would arise from the implementation of renewable energy strategy and the commissioning of the Naoro Brown Hydropower Plant (NBHPP) substituting diesel power (ICR, pp.45-46). However, according to the Least-Cost Power Development Plan (LCPDP), both the NBHPP and renewable power are considered as the least-cost options in the medium to long-term, not in the short-term. Given the findings of the LCPDP, it is not clear whether the PNG government will prioritize the development of NBHPP or the renewable power projects. Therefore, although the economic benefits presented in the ICR in terms reduction of GHG emissions can be used to justify the development of the NBHPP and the renewable power strategy under the project, there are serious concerns that those economic benefits might not materialize.

Moreover, the administrative and operational efficiency of the project significantly suffered from the unconducive country environment and the weak technical and institutional capacity on the ground. While this was a small



project, it took a long time to implement (2013-2019). Because of implementation delays, the project closure occurred 18 months after the original closing date. In addition to the changes in and the cancellation of original project activities, there were inconsistencies in what the project intended to do during implementation: for example, in the first restructuring development of a natural gas master plan was added to the project scope, but it was deleted in the following restructuring in 2017, because there was no progress and the government was considering to develop this plan under a separate funding (ICR, p.14). Because of insufficient funds, important activities and technical studies related to the development of new hydropower in the country could not be undertaken or were cancelled (ICR, p.12 and15). Lastly, some contracts required more financing than initially estimated at appraisal, such as the safeguards works for the NBHPP (ICR, p.2).

Overall, the project’s efficiency in achieving the project objectives is rated modest based on the achievements and shortcomings listed above.

### Efficiency Rating

Modest

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		0	0 <input type="checkbox"/> Not Applicable
ICR Estimate		0	0 <input type="checkbox"/> Not Applicable

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

### 6. Outcome

The project’s performance in achieving the first objective was substantial. The National Energy Policy was prepared, which forms the foundation for the development of energy sector, including increasing access to electricity under National Electrification Roll-Out Plan (NEROP). The NEROP is expected to move to the second stage of implementation under a follow-on project to be financed by the Bank.

The achievement of the second objective is rated negligible, because the project was not successful in attracting investors for hydropower development, and additionally, the government’s focus has shifted from new hydropower development to gas-to-power projects and rehabilitation of existing hydropower plants according to the findings of the Least-Cost Power Development Plan.

Project efficiency was modest because of a mix of reasonable costs and value-for-money achievements, and significant shortcomings in administrative and operational efficiency of the project.

Overall, the project’s outcome rating was Moderately Unsatisfactory.



**a. Outcome Rating**

Moderately Unsatisfactory

## 7. Risk to Development Outcome

Most achievements with the project's support were outputs which include the following: (i) a National Energy Policy, (ii) a National Electrification Roll-Out Plan, (iii) multiple studies and reports, and (iv) many trained staff. For the above achievements to be sustained and lead to progress toward second generation reforms and concrete outcomes in the areas of renewable energy and rural development and development of new hydropower generation, the Government will have to display the political will and ability to stay the course with the policy orientations, and to mobilize the needed resources to generate the thrust of promoting renewable energy and rural electrification, and attracting investors for sustainable development of new hydropower generation.

The ICR did not provide a convincing case regarding the Government's commitment and ability to move ahead with the reforms and to mobilize the needed resources to fund and press ahead with the agenda of promoting renewable energy and rural electrification and attracting investors for sustainable development of new hydropower generation. As an illustration, the ICR indicated on para 80 that " there is a risk that no developer may be interested in the NB HPP, and that this development outcome may not materialize". Moreover, the Government has shown its preference to move ahead with an IPP gas generation, instead of supporting the Naoro Brown Hydropower project. The failure to structure a bankable hydropower project in a country where there are risks ranging from country risk to off-take risk indicates that the risk of attracting a developer is real.

## 8. Assessment of Bank Performance

**a. Quality-at-Entry**

This was a simple technical assistance project aimed at strengthening the policy and institutional energy sector framework, and expected results consisted of studies and reports preparation requiring only easy fiduciary and monitoring actions. The project's goal was strategically relevant and its design reflected lessons learned by the World Bank in designing sustainable hydropower plants and was supported by several initiatives such as the visit to other countries to examine the experience in hydropower development. Key development partners were consulted to ensure that the project design is coordinated with their planned energy sector interventions.

However, the country's implementation capacity and readiness were insufficiently appraised during design, and project funds were not enough to implement some very important project activities (see Section 4). The absence of a Least-Cost Power Development Plan was a shortcoming, because when it was completed, it was found that the new hydropower was not the least-cost option in the hindsight. Moreover, the statement of the PDOs, and the setting of the PDO indicators and targets were



challenging. While the project objectives were simple, their clarity and the results and monitoring framework could have been improved, aiming at more precisely setting the adequate project's outcomes and PDO indicators and targets. For instance, the second objective related to the selection of a developer of the hydropower plant was overambitious, because of limited existing capacity and insufficient project's allocated resources.

Key agency and project risks were rated high during the preparation phase and mitigation measures were identified, including training in procurement and FM, and support on the social and environmental front to address eventual reputational risk for the World Bank. Moreover, technical, financial, and economic aspects of the project were analyzed through complementary sector studies and forecasts in order for the project to address the issues of the growing dependence on diesel generation and the shortcomings of existing hydropower units. Some attention was reserved to the environmental and social aspects to ensure environmentally and socially sustainable management of the implementation of the supported policies, and given the global environmental benefits that would arise from the implementation of the Naoro Brown hydropower in particular.

### **Quality-at-Entry Rating**

Moderately Unsatisfactory

#### **b. Quality of supervision**

There were long delays in the procurement of firms and consultants, and implementation progress was mostly rated as Moderately Unsatisfactory due to delays which led to low levels of disbursement. The Bank's project team initiated hand-holding solutions to mitigate the weaknesses in the implementation teams through hiring several planned and unplanned experts to support in the areas of procurement, safeguards and financial management of the project.

The Bank's project team fielded 18 missions to supervise different aspects of the project and to help support the project implementation, including the preparation of 12 Implementation Status and Results Reports (ISRs), which also updated the status of PDO and intermediate target indicators. For instance, when it became apparent that the Department of Petroleum and Energy (DPE) and power utility faced implementation shortcomings, there was a concerted effort to help the project find a procurement adviser after the second restructuring in 2017. The Bank's project team worked closely with the power utility team to recruit a series of the needed experts and consultants. The World Bank also assisted the power utility in identifying international experts that accompanied the utility team until the cabinet approves the Naoro Brown financing structure, and the ESIA final reports. Finally, the World Bank specialist helped to hire an expert with an accounting background who provided support to the DPE during the last two years. However, the Bank team continued to support the Naoro Brown hydropower project, although the Government had shifted its focus toward an IPP gas generation.

### **Quality of Supervision Rating**

Moderately Satisfactory



## **Overall Bank Performance Rating**

Moderately Unsatisfactory

## **9. M&E Design, Implementation, & Utilization**

### **a. M&E Design**

The project objectives were adequately specified, and the links in the theory of change were plausible, but the project's expected results were at the output level rather than outcome, as is the case in most of such technical assistance projects. However, the second objective had a clear outcome to attract investors for sustainable development of hydropower generation, but this was an overly ambitious goal for such a small technical assistance project.

Most of the outcome and intermediate results indicators were specific, measurable, relevant and time-bound, but they were mostly at the output level and did not capture the outcome impact of the technical assistance activities nor measured the quality of the products (ICR, Table 4, p.25); the indicator, i.e., "Financing for the Naoro Brown Hydropower Project is at an advanced stage measuring the achievement of the second objective with a target of "financiers' due diligence completed" and the related intermediate results indicator of "Developer for Naoro Brown Hydropower Project selected following transparent process" with a target of the mobilization of the developer in the third year of the project were not achievable. The M&E design did not fully capture the expected outcome of the project activities in strengthening the institutional capacity in the energy sector, which were mostly "conceived as ongoing trainings" (ICR, p. 26).

Regarding M&E arrangements, the project management unit would be responsible for monitoring the achievement of the indicators and report them quarterly, with support from consultants to be selected for the preparation of the documents and other deliverables.

### **b. M&E Implementation**

The revised outcome level indicators, i.e., "National Energy Policy and rural electrification strategy finalized by the Department of Petroleum and Energy following participatory process" and "Financing structure for the Naoro Brown Hydropower Project is approved by government," were more relevant and achievable compared to the original indicators, but they did not encompass the expected outcomes of the project objectives; the project objectives were not revised while the ambition of the project was substantially lowered. The indicators were easy to measure since they consisted of monitoring the development of the documents. The consultants contracted to develop these documents reported the progress regularly. On the other hand, the shortcomings in the M&E design in capturing the impact of the technical assistance activities on institutional strengthening were not corrected during implementation.

### **c. M&E Utilization**

M&E findings were shared with key stakeholders and they led to project restructurings adjusting "the project scope to the resource requirements, which exceeded the allocated budgets" (ICR, p.28). The M&E data were used to provide evidence for the application of inputs and achievement of outputs, rather



than the achievement of the outcomes. This was mostly because of the weaknesses in the M&E design, which did not fully encompass the expected outcomes of the project objectives. On the other hand, the M&E findings were used in the preparation of an approved Electricity Utility Performance Reliability Improvement Project, and an electrification project under preparation.

## **M&E Quality Rating**

Modest

## **10. Other Issues**

### **a. Safeguards**

The project was classified as a category B operation, but environmental and social (E&S) safeguards were prepared as if the project was a category A project. While the proposed project was to finance technical assistance and not investments, the project had activities aimed at catalyzing the development of the Naoro Brown Hydropower Project, which would have social and environmental impacts. That is why several social and environmental safeguard policies were developed in the PAD to deal with situations that would arise from the materialization of the Naoro Brown Hydropower project, although they were not triggered.

At project appraisal, only the OP 4.01: Environmental Assessment was triggered. But other social and environmental policies were developed in the PAD to preempt the situation whereby the Naoro Brown hydropower moves quickly to fruition, and were triggered during implementation. Social safeguards policies triggered during implementation included: (i) OP 4.10: Indigenous Peoples; and (ii) OP 4.12 Involuntary Resettlement. The environmental safeguard policies that were triggered during implementation were as follows: (i) OP 4.04: Natural Habitats; and (ii) OP 4.36: Forests, and (iii) OP-BP 4.37: Safety of Dams. The social and environment safeguards documents that were to be prepared to preempt the situation once the Naoro Brown Hydropower project Developer is in place are: (i) the Environment and Social Management Framework (ESMF); (ii) the Environment and Social Impact Assessment (ESIA); (iii) the Resettlement Policy Framework (RPF); and (iv) Resettlement Action Plan (RAP). The only key social and environmental study completed was the Environment and Social Impact Assessment (ESIA), which reflected the consultations conducted with the communities, and their interest in the benefits associated with employment opportunities and the launch of the Naoro Brown Hydropower project.

The ICR provided insufficient documentation on E&S safeguards developments during project implementation. Overall, six E&S policies were triggered at appraisal and during implementation and documented in ISRs, but the ICR did not reflect these developments. Additional information from the Bank team indicated that although the project was classified as Category B at appraisal and only triggered one policy (OP/PB 4.01), all work was carried out during preparation as if the project was classified as Category A. A private Consultancy firm undertook the ESIA work to cover all the safeguards policies that were triggered when the project was implemented. Some of the work under the ESIA included Environment inception report, social screening, communication strategy, environment and social management plan. Some of which were implemented under the ESIA work such as the social screening and communication strategy. The ESIA has been released by the consultant.



**b. Fiduciary Compliance**

**Financial management (FM).** Both implementation units displayed FM weaknesses and could not grasp the procedures and discipline required to account for project expenses. During implementation, the World Bank dedicated significant resources to achieve the desired level of precision in improving the handling of the project’s accounts, including bringing the interim financial reports (IFRs) up to date, but the 2017 and 2018 audit reports were still outstanding at project closure. By the ICR closure, the 2019 audit was also still outstanding. Training of the implementation units staff did not lead to an improvement in financial management (ICR, para 75).

**Procurement.** Throughout project implementation, procurement transactions were challenging due to limited expertise within the implementation units. While the project supported the hiring and training of the needed personnel, the quick rotation in the procurement team did not allow the development and retention of any institutional knowledge. As a result, there was poor procurement support from these entities throughout the project cycle. Implementation delays that led to the extension of the closing date arose predominantly from weaknesses in the procurement area. An external procurement adviser was hired and provided some support but could not overcome the structural obstacles associated with institutional setup of the units.

**c. Unintended impacts (Positive or Negative)**

None.

**d. Other**

None.

**11. Ratings**

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Unsatisfactory	Moderately Unsatisfactory	
Bank Performance	Moderately Satisfactory	Moderately Unsatisfactory	The Quality at Entry is rated Moderately Unsatisfactory because of shortcomings at appraisal, such as inadequate appraisal of the implementation capacity of the borrower, overly ambitious project objective, insufficient funds because of low estimation of the project cost, and weaknesses in the M&E



system. Since the Outcome rating is in the unsatisfactory range, the Bank Performance is rated Moderately Unsatisfactory per Bank guidance, although the Quality of Supervision is rated Moderately Satisfactory

Quality of M&E	Modest	Modest
Quality of ICR	---	Substantial

## 12. Lessons

The ICR has identified a number of important points listed on pages 32-33, but most of them are either findings or recommendations. Drawing from the ICR's material, this review identified the following lessons:

**Ensuring implementation readiness can better lead to results than trying to build the needed capacity during project implementation:** At appraisal, institutional and technical capacity weaknesses were identified in the project implementation units, particularly in the fiduciary areas. Mitigating measures were ineffective, and this situation led to delays in the project implementation, restructuring and extension of the project closing date. The project implementation experience confirms that ensuring that implementation units are ready in terms of staff quality and fiduciary expertise is essential for the timely project launch and implementation performance. Having the technical and institutional expertise in place ahead of project launch is better than trying to remedy the situation in the course of project implementation.

**Matching the scope and size of the project activities to existing institutional capacity may better contribute to achieving the expected outcome.** A key goal of this project was to achieve a bankable scheme for the development of the hydropower plant by a private investor. In hindsight, this outcome ended up being a very ambitious attempt, because of the absence of the required institutional capacity. The achievement of this outcome within four years was unrealistic given that such was a complex transaction process that had to tackle multiple challenges. The developer was expected to be selected by the end of the second year of project implementation, and the financiers' due diligence to be completed by the end of the fourth year. Because of the country's institutional weaknesses, progress toward outcome was minimum, and the Government opted to discontinue the hydropower plant idea in favor of an IPP gas generation.

**The completion of studies analyzing the aspects surrounding the project activities can help design a more realistic project.** The development of the Naoro Brown Hydropower Plant Project was a major undertaking requiring a comprehensive grasp of the country's power context. The construction of the new hydropower plant required a detailed preparation and development, including the completion of the three-river basin study that would form the basis for the hydropower supply plan for the Port Moresby area, as well as the Least-Cost Power Development Plan. The absence of a least-cost power development plan resulted in an unrealistic project design, because the 2018 findings of the Least-Cost Power Development Plan supported the rehabilitation of existing hydropower capacity and development of gas-to-power projects are lower cost options



compared to the option of launching the Naoro Brown Hydropower Plant Project. It is essential to complete the required key studies before embarking on any hydropower project.

### **13. Assessment Recommended?**

No

### **14. Comments on Quality of ICR**

The ICR provides a detailed narrative of the project context and the achieved limited results; and is generally evidence-based and internally consistent, as it provides a complete set of data, information and annexes that cover key aspects of the project design and implementation. However, the ICR has several weaknesses as follows: (i) the quality of analysis was reduced by the weaknesses of the theory of change and the results framework, (ii) the assessment of the efficiency was not fully consistent with Bank guidelines, as there was no need for the calculation of economic benefits and GHG emissions reduction due to absence of investments, (iii) the ICR could have been more concise (30 pages against the 15 required), and (iv) the reporting on safeguards compliance was incomplete.

#### **a. Quality of ICR Rating** Substantial