Report Number: ICRR0023780

1. Project Data

Project ID P146344	**Project Name** Nepal: Grid Solar & Energy Efficiency
Country Nepal	**Practice Area(Lead)** Energy & Extractives

L/C/TF Number(s)	**Closing Date (Original)**	**Total Project Cost (USD)**
IDA-55660	31-Dec-2020	98,207,279.29
Bank Approval Date	**Closing Date (Actual)**	
22-Dec-2014	15-Dec-2022	

	IBRD/IDA (USD)	Grants (USD)
Original Commitment	130,000,000.00	0.00
Revised Commitment	107,386,528.00	0.00
Actual	98,207,279.29	0.00

Prepared by	Reviewed by	ICR Review Coordinator	Group
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2. Project Objectives and Components

a. Objectives

According to the financing agreement dated 20 February 2015 (p. 5), the project development objectives (PDO) are to: (i) increase the solar photovoltaic generated electricity to supply to the Nepal Electricity Authority (NEA) grid; and (ii) reduce NEA's distribution losses in selected distribution centers. The articulation of the project's objective is the same in the financing agreement and the Project Appraisal Document (PAD).

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: Grid-connected Solar PV Farms Development (Estimated cost: IDA USD54.0 million; actual cost: IDA USD30.28 million).

This component was to finance four parts: (a) Design, supply, construction, commissioning, operation and maintenance of grid-connected solar farms to supply electricity directly to NEA's distribution network, (b) Provision of technical advisory services to assist NEA with the procurement and supervision of the engineering, procurement, and construction contract for the solar farms, and (c) Provision of capacity building activities to assist NEA with, *inter alia*, independent bid evaluation, project management, contract execution, and operation and maintenance of the solar farms.

Component #2: Distribution System Planning Loss Reduction (estimated cost: IDA USD 84.0 million; actual cost: IDA USD75.26 million).

This component was to support three parts: (a) preparation of a distribution master plan, (b) preparation of a system loss reduction master plan, (c) carrying out a set of activities in system loss reduction in selected NEA's distribution centers, including: (i) replacing conductors of distribution feeders or building distributions lines to reduce line losses; (ii) adding or replacing distribution transformers to maintain voltage levels and reduce transformer losses; and (iii) adding capacitor banks to compensate reactive power to manage voltage levels, and (d) building the capacity of NEA in distribution system planning and management, including: (i) provision of equipment, software, and training for distribution system loss identification and reduction planning; and (ii) development of a geographic information system database.

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

Project cost and financing: According to the ICR, the project cost was originally estimated to be USD138 million, comprising a USD130 million IDA Credit and USD8 million from the Government of Nepal (GON). Additional information provided by the project team showed that at the time of signing of the financing agremeent the IDA Credit was equivalent to USD116.7 million due to appreciation of the USD out of which USD94.2 million was disbursed and USD22.4 million was undisbursed and eventually cancelled.

Due to exchange rate differences the disbursed amount of USD94.2 million reported by the project team was lower than the USD98.2 million shown in the ICR and data sheet by USD4 million. The reason for this discrepancy is that disbursements took place at different SDR/USD exchange rates throughout the course of project implementation resulting in an overall gain of US$4 million due to the appreciation of the USD.

Dates: The project was approved on 22 December 2014, the financing agreement was signed on 20 February 2015, and the project became effective on 14 June 2016. The mid-term review was conducted

on 7 May 2018. The original closing date was 31 December 2020 but, after three restructurings, the project closed on 15 December 2022, about 24 months behind schedule.

- The first restructuring (Level 2 – 30 November 2020) extended the project closing date by 12 months from 31 December 2020 to 31 December 2021.
- The second restructuring (Level 2 – 2 December 2021) further extended the project closing date by 11.5 months to 15 December 2022, and extended the submission timeline for the external audit report by three months.
- Third restructuring (Level 2 – 13 December 2022) was for the cancellation of USD15 million of unused funds from the Project. In addition to this unused funds, the ICR noted that an undisbursed balance of SDR5,674,194.90 (equivalent to USD7 million) was cancelled on 24 April 2023.

According to ICR (p.5), the first and second restructuring were needed to allow for additional time to complete the ongoing project activities that had been hindered due to delays in contract implementation caused by the COVID-19 pandemic during 2020-2022. The third restructuring was to cancel the USD15 million that was unused by the project. All three restructurings were requested by Nepal's Ministry of Finance (MOF). All three restructuring had no impact on the project's Theory of Change (TOC) and expected outcomes.

3. Relevance of Objectives

Rationale

The project objectives are aligned with the World Bank's strategy in Nepal, as highlighted in the Country Partnership Framework for FY2019-23 (CPF) for Nepal. The World Bank strategy for Nepal focuses on private sector-led jobs and growth (Focus Area 1), and the CPF notes that gaps in energy infrastructure and access remain a "*significant constraint against increased private sector investment, productivity and livelihoods in Nepal*" (CPF, p.14). Furthermore, objective 2.1 of the CPF aims to support improved power generation capacity and access to electricity. Both objectives of the Grid Solar & Energy Efficiency Project (GSEEP) resonate with the Bank's strategy in Nepal. The first objective sought to directly increase power generation through the construction and operation of solar farms that add up to 25 MW to the national grid. The second objective sought to increase electricity supply by reducing distribution losses.

The project's objectives were consistent with the Nepal government's vision and strategy for the power sector, as detailed in the 2013 National Energy Strategy of Nepal and referenced in the PAD. According to the PAD, the government's vision for the power sector is to address the country's energy crises and eventually achieve reliable, affordable, and sustainable electricity supply in Nepal. To reach this vision, the government's strategy is to: (a) reduce load shedding by adding generation capacity that can be quickly installed in the short term and by reducing system losses; (b) reach supply demand balance in the medium term through the commissioning of hydropower and importing power from India; and (c) develop more of its hydropower resources and integrate into the regional power market to earn export revenues and sustain domestic growth in the long term (PAD, p.3). The objectives of the GSEEP align with item (a) of the government's strategy.

The project objectives were appropriately pitched to the development status and capacity of the country. The project involved installation of the first large-scale grid-connected solar plants in Nepal and, as such, the borrower had limited capacity to prepare, operate, and manage the project. Thus, the project sought to mitigate capacity and implementation risks by adopting a build-operate-manage-and-transfer approach. The solar plants were constructed by competitively selected contractors whose responsibility included managing the plants for their first five years while training NEA staff on project operation and management to prepare NEA for the eventual take-over of the plants. Project implementation was also cognizant of potential land access issues that commonly arise in fragile countries like Nepal. Hence, to avoid land access risks that can potentially put achievement of project objectives at risk, the project sought to avoid installation of project components on private land and instead limited construction to land already owned by NEA.

Overall, the project's objectives align strongly with World Bank strategy, government strategy and country context. Hence, the relevance of objectives is rated **High**.

Rating
High

4. Achievement of Objectives (Efficacy)

OBJECTIVE 1
Objective
To increase the solar photovoltaic generated electricity to supply to the NEA grid.

Rationale
Although objectives #1 and #2 of the GSEEP are both aimed at contributing to the long-term outcomes of providing efficient, reliable, affordable, and sustainable electricity supply, each objective has distinct result chains (as shown in Figure 1 of the ICR). Hence, this section discusses the efficacy of each objective separately.

At appraisal, the GSEEP planned to support the design, supply, construction, operation, and maintenance of grid-connected solar farms. Project activities include the provision of finance and technical support to assist NEA in the procurement and supervision of the construction of the solar farms as well as capacity building activities to assist NEA with operation and maintenance of the solar farms.

According to the TOC, the expected output from these activities was the commissioning of 25 MWp of total solar power generation capacity. The intermediate outcome was the generation of 33GWh of electricity annually from the newly constructed solar power plants, which was expected to lead to the PDO outcome of increasing solar PV-generated electricity to the NEA network. Overall, the linkages between the project activities, outputs and outcomes were clear and convincing.

As of project closing date, solar PV power plants were successfully installed across seven sites, all of which had a collective capacity of 25MWp. The first site commenced operations in January 2021 and the final site

became operational in August 2022. The ICR (p.6) reported that data from NEA shows that the new solar plants generated an output of 33.02GWh in the year between September 2022 and August 2023, slightly exceeding the annual target of 33GWh.

Overall, given that these solar plants were the first large-scale grid-connected solar PVs in Nepal (ICR p.9) and electricity generation from power plants is easily measurable through metering, the electricity output reported in the ICR met its targets and is attributable to the installation and operation of the new solar plants. Therefore, it is rated Substantial.

Rating
Substantial

OBJECTIVE 2
Objective
Reduce NEA's distribution losses in selected distribution centers.

Rationale
At appraisal, project activities planned under objective #2 included the preparation of a distribution master plan (DMP) and a distribution loss reduction master plan (DLRMP); installation of infrastructure necessary for system loss reductions in several distribution centers based on the recommendations of the DLRMP; and capacity building of NEA for distribution loss management through the provision of instruments, software, and training for distribution system loss identification and reduction planning.

As presented in Figure 1 of the ICR, the TOC for this objective was that the project activities would lead to the development of a DMP and a DLRMP, as well as the construction of 3,000 kilometers of distribution lines — these are the project outputs. The intermediate outcome anticipated from these outputs was a 15% reduction in distribution loss in selected areas, which was then expected to lead the PDO indicator of reducing distribution loss in selected areas. This TOC is however misleading. The TOC suggests that the development of the master plans and construction of the distribution lines are unconnected activities to be implemented in parallel. However, additional details presented in other sections of the ICR and provided by the project team revealed that the completion of the master plans was intended to precede and inform the construction of the distribution lines. Furthermore, Figure 1 of the ICR presents 15% reduction in losses in selected distribution areas as an intermediate outcome. However, the four intermediate indicators presented in the text of the PAD and ICR do not include 15% reduction in distribution losses. Thus, the loss reductions are shown as both intermediate and PDO outcomes in the TOC.

At completion, the project completed the proposed project activities, but not in the right order. The ICR (p.6) notes that preparation of the master plans was significantly delayed due to "challenges in collecting distributions system data" and "COVID-19 related restrictions". Hence, the World Bank and NEA agreed to proceed with implementing the planned investments for system loss reductions based on NEA's previous internal assessment of the distribution centers in need of immediate improvement, rather than based on recommendations from the DMP and DLRMP. The preparation of the distribution master plans was conducted in parallel with, rather than in advance of, these investments. Nevertheless, upon completion, the DLRMP validated the choice of the distribution centers chosen for loss reduction improvements.

The ICR presented evidence that all three intermediate indicators for this objective were met, but it did not present sufficient evidence that the PDO indicator for this objective was achieved. The DMP was completed in 2019 and the DLRMP in 2022 – this confirms that the latter could not have informed the selection of distribution investments since it was available less than a year before project closing date. The ICR reports that by project closure, both the DMP and DLRMP had been adopted by the NEA as the core strategy and roadmap for the expansion and rehabilitation of its distribution network. The third intermediate indicator, length of distribution network rehabilitated was also achieved because the total length of 3,608 km of distribution lines constructed/rehabilitated exceeded the target of 3,000km set at appraisal.

The extent to which the distribution network improvements led to distribution loss reduction in the selected centers is unclear. The ICR notes that because NEA lacked the capability to measure losses for individual lines and transformers, the team had to rely on NEA's measurement of country-wide distribution losses. Additional information requested from the project team revealed that NEA's country-wide distribution losses reduced from 25.78 % in FY2015/16 to 15.38 % in FY2021/22. The ICR claimed that project activities under this objective played a part in achieving this reduction, but that estimating the precise loss reduction attributable to this project was impossible given the limitation in measuring distribution loss data for individual distribution centers.

Furthermore, the construction of the distribution network involved nine contracts, seven of which were procured through International Competitive Bidding (ICB) and two through National Competitive Bidding (NCB). By the project closing date, four ICB contracts and two NCB contracts had been completed. Three ICB contracts (ICB-2, ICB-8, and ICB-9) were affected due to COVID-19 restrictions and delays in land clearance process, and were still under implementation, with completion expected by December 2023. The outstanding activities under these uncompleted contracts relate to the installation of 33kV transformers.

Overall, project activities under objective #2 would have contributed to system loss reduction in the selected areas because of the nature of the investments, although the level of contribution could not be quantitatively determined. In addition, the project would have strengthened the network for additional loss reductions in future because of the completion of the following: 1) rehabilitation and construction of the targeted length of distribution lines; 2) adoption of the completed DMP and DLRMP by NEA; and 3) training activities to build NEA's capacity to identify and manage distribution loss reductions. However, because there is insufficient evidence to demonstrate that these network improvements did deliver the targeted reduction in distribution losses as at project closing date, the efficacy rating for this objective is **Modest**.

Rating
Modest

OVERALL EFFICACY
Rationale
The project achieved all intermediate outcomes set at appraisal. The project also achieved its first PDO outcome. However, there is insufficient evidence that the second PDO outcome was achieved as at the

project closing date. Hence, based on the evidence available, the project only partly achieved its objectives. Therefore, the overall efficacy rating for the project is **Modest**.

Overall Efficacy Rating	Primary Reason
Modest	Insufficient evidence

5. Efficiency

Economic Analysis

While the GSEEP comprises two project components, at appraisal, an economic analysis was conducted for component #1 only. The economic benefit of the activities under this component was defined as the avoided cost of generating the same targeted amount of electricity from alternative energy sources, which was assumed to be a diesel power plant. The cost of electricity generation from diesel was estimated to be USD31.6/kWh, compared to an estimated USD14.9 cents/kWh from solar PV. It was also assumed that the economic life of a diesel plant is 20 years, so an additional diesel generator would need to be installed after the first diesel generator is retired in 20 years. Assuming the solar farms have a lifespan of 25 years, the net present value (NPV) of solar farms over the diesel plant computed at the discount rate of 10% was estimated to be USD44.0 million and the Economic Internal Rate of Return (EIRR) was 50.7 %. Hence electricity generation from the GSEEP was adjudged to be more cost-efficient than from an equivalent diesel plant. Additional environmental benefits of the GSEEP were not captured in this economic analysis.

Estimates of the economic benefit of the project were lower at completion than at appraisal. At the time of project evaluation, an economic analysis was conducted for Components #1 and #2. This economic analysis computed the EIRR and net present value (NPV) based on the energy generated from Component #1, estimated loss reduction from Component #2, actual project costs adjusted for changes in macroeconomic conditions, and international fossil fuel market prices. At project evaluation, the NPV for the project overall was USD380.4 million at project evaluation and the EIRR was 26%. Including climate benefits, the aggregate EIRR and NPV of the project at completion were estimated to be 28% and USD410 million, respectively. For Component #1 alone, the NPV was USD30.5 million at project evaluation compared to USD44.0 million at project appraisal.

At project completion, the capital costs of the project were also lower than had been expected at appraisal. Including contingencies, the total capital costs at appraisal were estimated to be USD126 million (at constant 2013 prices). At project closing, the actual economic construction costs of the project (still at constant 2013 prices) stood at USD105.54 million, 16% lower than appraisal estimates. The ICR attributes these savings to lower solar PV investment costs, thanks to the maturity of the technology (p.8). Notwithstanding these cost savings, economic returns at completion declined due to the decrease in forecasted international energy prices at project completion in 2023 compared to the prices forecasted during the appraisal in 2013 (ICR p.8).

Despite downward revisions of the economic benefits of the project at project completion, the economic analysis adjudged the project to be economically viable and financially efficient. The EIRR of 28% exceeds the 10% discount rate, indicating that the project is economically viable. The NPV of USD410 million also exceeds the project cost of USD105 million, indicating that the net cashflow from the project over its lifetime is expected to exceed the project's costs.

Administrative and Operational Efficiency

Project completion was delayed by 24 months due predominantly to insufficient staffing levels with the Project Management Unit that required substantial support from the World Bank to ensure compliance with fiduciary requirements (ICR, p.8). The ICR claims that despite this delay, the total project cost was lower than expected, and the extension in the closing date did not affect the project's efficiency. This argument, however, does not account for the opportunity cost of the staff time. The time that the World Bank staff spent to fulfill the additional administrative and reporting obligations created by the extension is time that could have been expended on other projects in Nepal. This opportunity cost undermines the project's operational efficiency.

Overall, despite downward revisions in the estimated economic benefits of the project and delays in project completion, the project cost less at completion than was expected at appraisal. The estimated net benefits from the project also exceeds the net benefits from a second-best electricity generation alternative—i.e., a diesel plant. Hence, 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	✓	50.70	35.38 ☐ Not Applicable
ICR Estimate	✓	26.00	100.00 ☐ Not Applicable

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

6. Outcome

The project's objectives aligned strongly with World Bank strategy, government strategy and country context, and the relevance of the PDOs is rated **High.** The project's efficacy is rated **Modest** because, while the outcome indicator for PDO#1 (energy generation from solar development farms) met its targets, there is insufficient evidence that the 15% loss reduction target for PDO#2 was achieved in the selected distribution areas. The project's efficiency was rated **Substantial** because its net benefits remained significantly above the hurdle cost of capital of 10% and, apart from the opportunity cost of staff time due to delayed implementation, there were no other significant administrative inefficiencies. The net benefits were lower at completion than at appraisal because, despite the lower capital costs resulting from decreases in international prices of solar components, forecasted international energy prices were also lower at project completion.

Overall, the project's outcome is rated **Moderately Unsatisfactory** in accordance with Bank guidance (p. 38).

a. Outcome Rating
Moderately Unsatisfactory

7. Risk to Development Outcome

The construction of the seven solar PV plants was procured under a single Engineering, Procurement, and Construction (EPC) contract. After construction, the contractor is responsible for operating and maintaining the plants for five years while training NEA staff to take over afterwards. Given the novel nature of large-scale grid-connected solar PV in Nepal, this O&M model should enable NEA to acquire the technical expertise required to operate and maintain the plants. However, it also presents risks for the long-term sustainability of the development objectives already achieved by the project. Possible sources of risks include, but are not limited to, incomplete knowledge transfer from the contractor to NEA by the end of the five-year period, labor market churning that can result in NEA's inability to retain already trained staff, as well as uncertainties about NEA's financial viability.

8. Assessment of Bank Performance

a. Quality-at-Entry
Adding electricity generation capacity and reducing system losses are of high strategic relevance to the Nepal government's objective of increasing electricity access. The project's activities and design were sufficiently appropriate to support the achievement of this objective. The construction of the solar farms (Component #1) was relevant for adding generation capacity and the preparation of distribution plan and reinforcement of distribution lines in selected areas and (Component #2) was relevant for reducing system losses. The technical preparation for project activities under Component #1 was adequate for the successful construction of the solar farms. However, significant limitations in collecting data on distribution losses hindered the project's ability to implement and track impact of activities under Component #2 as planned and the project failed to anticipate or plan for these limitations at appraisal.

The project design benefited from the experience gained and lessons learned in implementing earlier power projects in Nepal. The project made efforts to avoid land acquisition issues that had delayed the implementation of earlier donor-funded transmission line projects in Nepal. Additionally, project design recognized the pioneering nature of the project for large-scale solar farms in Nepal, and the associated limitation in implementation capacity for solar projects in the country. To address this capacity limitation, the project was designed to engage external expertise to assist NEA in procurement, construction, supervision, testing, operation, and management of the solar farms, and to build the capacity of NEA to undertake these activities.

Quality-at-Entry Rating
Satisfactory

b. Quality of supervision

The task team provided support to the client on a range of issues such as procurement and contract management; social and environmental safeguard compliance; legal covenant compliance; as well as technical guidance. The Project was regularly monitored through implementation support missions, documented in Aide Memoires and Management Letters. Reporting was done through regular Implementation Status and Results Reports (ISRs). During each mission, the task team conducted a detailed assessment of the Project status and identified challenges. The task teams also conducted site visits, with a particular focus on the most challenging subprojects that needed the World Bank's support. Ratings from ISRs were actively shared with the client, serving as performance signals for NEA. When the client requested project closing date extensions, the World Bank team required the Borrower to provide implementation action plans as evidence of realistic expectations for completion of activities within the proposed new closing dates.

Quality of Supervision Rating

Satisfactory

Overall Bank Performance Rating

Satisfactory

9. M&E Design, Implementation, & Utilization

a. M&E Design

The TOC was valid in objective #1 but had shortcomings for objective #2. For objective #1, the linkages between the construction of the power plant, the supply of solar PV electricity to the NEA grid and, ultimately, to the long-term outcomes were clear and plausible. For the objective #2, the TOC failed to show that the completion of the master plans was supposed to precede and inform the construction of the distribution lines, thereby obfuscating the causal links between project activities and outcomes.

Similarly, the PDO indicator for objective #1 was measurable, achievable, relevant, time-bound, and specific, but the PDO indicator for objective #2 was not. At appraisal, the PDO indicator for objective #2 – namely distribution loss reduced in selected distribution centers (%) – was not measurable as NEA lacked the capacity to measure distribution loss reduction for individual distribution centers. This indicator was also not specific as it was unclear whether the target was to reduce distribution losses by 15% or to 15%.

b. M&E Implementation

The quality of the project's M&E implementation was insufficient to provide reliable evidence of result achievement for objective #2 of the project. The failure of the M&E design to anticipate the difficulty in measuring also hindered the assessment of the second PDO indicator. Because NEA did not have systems and procedures to directly measure the losses for each distribution center, the reduction in distribution losses could not be measured at a center-specific level. Furthermore, there is a misalignment between the M&E design and implementation, as the evidence presented in the M&E implementation

does not match the target set in the M&E design. On p.2, the ICR notes that the anticipated outcome for the component 2 was "*reduction of distribution losses by 15 % in the targeted distribution network under the Project*". However, on p.7, the evidence of result achievement presented is that "*by the time of project closing, country-wide system losses were reduced to 15%.*".

c. M&E Utilization

The ICR (p.12) notes that the data on progress were collected regularly and were utilized effectively to inform the management on key decision to be taken. However, the document did not specify the key decisions that were made based on the progress.

Overall, there were significant shortcomings in the M&E design and implementation, and the utility of the M&E outputs was unspecified in the ICR. Therefore, the M&E quality is rated **Modest**.

M&E Quality Rating

Modest

10. Other Issues

a. Safeguards

Environmental safeguards

At appraisal, the Project was classified as category 'B' and three environmental safeguard policies, OP/BP 4.01 - Environmental Assessment, OP/BP 4.36 - Forests, and OP/BP 4.11 - Physical Cultural Resources, were triggered. The project was expected to have limited adverse environmental and social impacts, which were site specific, reversible and could be readily addressed through good engineering practices and mitigation measures. The potential adverse issues/impacts were associated with site clearing (shrub vegetation removal) & excavation, waste management, and management of labor camps. Most of the impacts were temporary in nature and limited to the construction phase. Except for the visual quality, the footprint of operational phase impacts of the Project was expected to be negligible. Potential environmental concerns of the solar farms during the operational stage included wastes that may contain glasses, chips, and photo-voltaic cells. Specific issues related to Component 2 are PCB (Poly Chlorinated Biphenyl) in the transformer and dismantling of the existing conductors. For this reason, the project noted that PCB based transformer and capacitor banks will not be used under the Project. The ESMF prepared for the Project also acknowledged these issues and included measures for addressing them in the project implementation process, such as provision for safe management of the existing conductors and transformers that will be removed/dismantled.

The ICR (p.13) reported that during implementation, the project hired an Environmental and Social Study Division (ESSD) and NEA Engineering Company to ensure that work on the solar plants and the distribution substations complied with relevant Environmental and Social (E&S) requirements. E&S requirement was fulfilled by the NEA project site engineers and project components managers in consultation with the World Bank team. The Project avoided tree cutting where possible along the distribution line route. Wherever tree cutting was required, the community forest user group's consent was taken during the Project

implementation, complying with OP/BP 4.36 - Forests. The Project's environmental safeguard planning and implementation were ensured through the preparation of E&S screening and Environmental and Social Management Plan (ESMPs) in line with the Project-specific Environmental and Social Management Framework (ESMF) in compliance with OP/BP 4.01 - Environmental Assessment. The Project activities avoided the impact on physical cultural resources and followed the principle of avoidance, minimization, and mitigation hierarchy for environmental risk management through the application of techniques, which included alignment of distribution line routes to avoid impact on government and community forest areas, mitigation of vulnerable slope instability/erosion, spoil disposal, and water logging issues of the substations.

b. Fiduciary Compliance

The project experienced financial management issues during implementation. In the initial years of implementation, the project maintained an acceptable level of financial management (FM) and was rated 'Moderately Satisfactory'. However, after August 2020, this rating was downgraded to 'Moderately Unsatisfactory' because of unresolved audit qualification and other identified internal control issues. The major reasons for the 'Moderately Unsatisfactory' rating are (a) lack of timely and quality of financial reports, (b) unreconciled internal balances, (c) delays and irregular internal audit of the Project, (d) compliance gaps in ensuring timeline of insurance and bank guarantee contracts clauses, and (e) absence of physical verification for capital work in progress. Despite regular follow-ups from the World Bank team on the action plan for the Project to improve overall FM, the progress was not satisfactory, as reflected in the Aide Memoires issued by the World Bank since August 2020. The high turnover of finance staff in the Project also affected the FM performance of the Project, which required constant handholding from the World Bank FM team to maintain quality of FM reports and capacity of the incumbent finance staff to ensure adequate FM arrangements are in place. Overall, FM performance of the Project remained Moderately Unsatisfactory at closing.

c. Unintended impacts (Positive or Negative)

None

d. Other

Gender

The GSEEP was not a gender-tagged project. However, during preparation and implementation of the Project, NEA conducted several consultations with Project beneficiaries, both male and female. The Project also supported community activities including drinking water supply systems for communities around the solar power plants and provision of computer lab for schools. These efforts benefited the communities, but the project did not particularly measure the benefits to women and girls

Institutional Strengthening

The Project trained 50 participants in various stages of preparation of the DLRMP. The training program mainly covered the relevant definitions and classifications of the distribution system losses and methods of system loss reduction and planning. The master plan is also considered as a useful guide, which identified distribution losses and system weak points and recommended necessary modifications required in the system. In addition, seven participants received international training in Vietnam on appropriate tools and methodology on system loss reduction techniques. During their visit to a factory, they also gained an understanding of the manufacturing process and maintenance procedures for smart energy meters and acquired knowledge about quality control.

Mobilizing Private Sector Financing

The GSEEP did not directly mobilize private financing, but investments made under Component 1 of the Project encouraged the IPP investors to enter the solar power PV generation systems in Nepal. The implementation of the GSEEP can potentially has positive demonstration effects in Nepal's energy sector. This is because the project was Nepal's first large-scale grid-connected solar PV system and demonstrated the feasibility of implementing such large-scale solar plant in the country.

Poverty Reduction and Shared Prosperity

The ICR noted that lack of electricity is one of the major obstacles for doing business in Nepal. The GSEEP enhanced both the generation capacity and the distribution networks, which contributed to improving the power supply quality and reliability. However, no specific analysis was conducted to demonstrate Project's direct impact on poverty reduction.

11. Ratings

Ratings	ICR	IEG	Reason for Disagreements/Comment
Outcome	Moderately Unsatisfactory	Moderately Unsatisfactory	
Bank Performance	Satisfactory	Satisfactory	
Quality of M&E	Modest	Modest	
Quality of ICR	---	Modest	

12. Lessons

This review draws two lessons based on the information in the ICR.

Future projects on loss reduction should focus on developing capacity for measuring loss reduction. Ensuring that the implementing agency has the technical ability to accurately measure distribution losses is critical for tracking the impact of investments targeted at reducing system losses. Although the investments and distribution centers prioritized by the DMP and DLRMP turned out to be valid for loss reduction, the absence of appropriate tools and systems for data collection on losses in those areas resulted in an inability to assess the impact of the project on loss reduction in

the selected areas. Hence, future project teams should establish that the capacity to assess loss reduction is put in place prior to undertaking further investments.

Like the GSEEP, projects in fragile country settings should pay attention to land access issues. In fragile countries like Nepal, property rights are often poorly defined or weakly enforced. For this reason, project implementation involving land acquisition from private landowners are at risk of delay or derailment if ownership rights for such lands are disputed or if implementing agencies face difficult negotiations with private landowners. To avoid these issues, project teams should consider limiting project activities to publicly owned lands. However, the process of securing approval from public authorities for the use of public land can be lengthy. Hence, the process to obtain government approval should begin well in advance to avoid delays in land acquisition and project implementation.

13. Assessment Recommended?

No

14. Comments on Quality of ICR

The report mostly follows and responds to the Bank's ICR guidance, and the narrative is concise. Including its annexes, the ICR presents a substantial level of detail about project activities that have or have not occurred as planned at appraisal. Although some of the claims made in the ICR are substantiated by weak evidence, the report is candid about those limitations. The economic analysis is detailed but the scope of the cost-benefit analysis differed at completion versus at appraisal, making a pre-project and post-project comparison of EIRR difficult. The presentation of the TOC for objective #2 in the ICR was misleading and inconsistent with the PAD. The disbursement and cancellation amounts reported in the ICR was inconsistent with those reported directly by the project team and the ICR did not explain the reasons for the discrepancy. Overall, the quality of the ICR is rated **Modest**.

a. Quality of ICR Rating

Modest