The Democratic Socialist Republic of Sri Lanka: Clean Energy and Network Efficiency Improvement Project
ABBREVIATIONS

ADB – Asian Development Bank
APFS – audited project financial statement
CEB – Ceylon Electricity Board
CEF – Clean Energy Fund
CBO – community-based organization
CO₂ – carbon dioxide
DMF – design and monitoring framework
EIRR – economic internal rate of return
FIRR – financial internal rate of return
GRM – grievance redress mechanism
GSS – grid substation
km – kilometer
kV – kilovolt
MW – megawatt
O&M – operation and maintenance
OSPF – Office of the Special Project Facilitator
PCR – project completion report
PMU – project management unit
PUCSL – Public Utilities Commission of Sri Lanka
SLSEA – Sri Lanka Sustainable Energy Authority
T&D – transmission and distribution
TA – technical assistance
WACC – weighted average cost of capital

NOTE

In this report, “$” refers to United States dollars and “SLRs” refers to Sri Lanka rupees.

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I. PROJECT DESCRIPTION

A. Rationale

1. Sri Lanka’s electrification ratio improved from 29% in 1990 to 78% in 2006 and to 91% in 2011. Rapidly increasing thermal power generation from 6% of the total in 1995 to 54% in 2011 met the country’s power demand. This made it difficult for the country to reduce its dependence
on imported fossil fuels, mainly oil. Addressing the lower electrification ratio in the post-conflict north and south regions required power transmission and distribution (T&D) systems expansion.

2. Sri Lanka’s 10-Year Development Framework 2006 and its 2010 update sought to (i) expand infrastructure to accelerate economic growth, (ii) narrow regional disparities, (iii) encourage the more sustainable development of energy resources for greater access; and (iv) provide more reliable electricity services.¹ The framework aimed to (i) increase the power supply capacity to 6,400 megawatts (MW), (ii) raise the share of renewable energy to 20%; and (iii) reduce technical and commercial losses to 12% by 2020. An electrification ratio of 100% was targeted by 2012. Two focus areas of Asian Development Bank’s (ADB) Strategy 2020 were inclusive economic and environmentally sustainable growth. Core areas of ADB’s operations in the energy sector included (i) expanding energy supply, (ii) promoting energy efficiency, and (iii) supporting clean energy.² ADB’s 2009 Energy Policy and country partnership strategy (2012–2016) for Sri Lanka also prioritized support for improved energy efficiency and renewable energy development.³

3. The Clean Energy and Network Efficiency Improvement Project (the project) expanded power transmission in the northern region and strengthened T&D network in seven regions.⁴ The project also supported installation of rooftop solar power systems in commercial and industrial establishments and universities, and capacity building for clean power development.⁵ It followed earlier assistance that addressed post-conflict electricity needs in the northern and eastern regions in 2010 and 2011, respectively.⁶

B. Expected Impact, Outcome, and Outputs

4. The project’s expected impact was reliable, adequate, and affordable power supply for sustainable economic growth and poverty reduction. The expected outcome was improved clean energy supply, efficiency, and reliability in the delivery of electricity in the project provinces. The project had four targeted outputs: (i) strengthening of transmission infrastructure in the Northern Province; (ii) improved efficiency of transmission and distribution networks; (iii) development of solar rooftop power generation; and (iv) provision of advisory and capacity building support in developing wind and solar power on a public–private partnership basis.⁷ The design and monitoring framework (DMF) was modified later to better reflect the intent of the 2012 report and recommendation of the President. The project completion report (PCR) indicated that there were two minor changes in scope: (i) increasing the voltage level and capacity of one substation, and (ii) constructing a solar research and development center. The performance targets and indicators were unchanged.

⁴ Central, Eastern, North Central, Northern, Sabaragamuwa, Southern, and Western Provinces.
⁷ An associated knowledge and support TA supported the capacity building output.
C. Provision of Inputs

5. The project was approved in September 2012 and the loan was signed in May 2013. Completion was expected after 4 years in June 2016. Loan effectiveness was delayed until September 2013 due to the longer time needed for clarifications and negotiations between the Attorney General and the executing agencies. Loan closing date was planned for June 2017, with project completion by December 2016. The actual loan closing date was in March 2020, with the project implemented over 79 instead of 58 months. The PCR indicated that the project was delayed due to (i) the 3-year construction of the 220 kilovolt (kV), 73.2-kilometer (km) New Polpitiya–Pannipitiya transmission line in the difficult terrain; (ii) the route’s realignment to reduce its environmental impact; (iii) securing right-of-way clearances; (iv) difficulties in accessing forest areas; (v) adverse weather conditions; and the (vi) work suspension in 2017 on a 4 km stretch in Magammana district due to litigation.\(^8\)

6. The estimated project cost was $200.0 million, while the actual figure was $133.9 million. Lower contract costs of $38.4 million meant the $13.8 million contingency remained untouched and the financial charges were lower by $13.9 million. The PCR indicated that the reasons for the cost underrun were (i) the Sri Lanka rupee (SLR) depreciated by about 33%, from an assumed $1.0 to SLRs131.95 at appraisal to SLRs175.5 by project completion; (ii) highly competitive bids submitted in response to the international competitive bidding used for the nine main turnkey contract packages; and (iii) high original engineering estimates. At appraisal, the ADB loan was $131.5 million—a $100.0 million loan from ADB’s ordinary capital resources (50.0% of the total project cost), a $30.0 million equivalent loan from the Asian Development Fund (15.0%), and a $1.5 million grant from the Clean Energy Fund (CEF) under the Clean Energy Financing Partnership Facility (0.8%).\(^9\) The Government of Sri Lanka and the Ceylon Electricity Board (CEB) were to contribute $68.5 million (34.2% of the total). At completion, the total ADB loan amount was $114.6 million (66.2% of the project cost)—$90.5 million from ADB’s ordinary capital resources (68.3%), $24.1 million from the Asian Development Fund (18.1%), and $1.0 million from CEF (0.8%). The government and CEB provided $18.3 million (13.8%), significantly less than envisaged due to the lower contract costs.

7. An ADB knowledge and support technical assistance (TA) was associated with the project which supported wind and solar power development under a public–private partnership arrangement.\(^10\) The approved TA was for $900,000, of which $825,427 (91.7%) was spent. A partnership of two US-based engineering firms was engaged to implement part A of the TA that focused on power system stability and network planning; and another partnership of Sri Lanka- and India-based consulting firms supported part B that assisted in preparing the country’s renewable energy master plan and the business model for the proposed wind farm. The total planned effort and utilization were 20 person-months of international and 22 person-months of national consulting services.\(^11\) The PCR indicated that the TA was rated successful—relevant, effective, and efficient in achieving its output and outcome, and likely sustainable. The PCR

\(^8\) Other reasons for the implementation delays were (i) procurement delay and time required to secure port clearance for numerous small consignments; (ii) a change of shipping agency for imported cargo that the government announced in 2016; and (iii) changes in the technical specification and procurement for meeting new requirements, e.g., upgrade of Mannar grid substation (GSS) from 132 kV to 220 kV for evacuation of power from the Mannar wind farm being developed by the private sector.

\(^9\) Governments of Australia, Norway, Spain, Sweden, and the United Kingdom contributed to the CEF.


\(^11\) The TA outputs included (i) power system stability and network planning studies, (ii) the country’s renewable energy master plan, (iii) a proposal for the Mannar 100 MW wind farm, and (iv) a grid code for connecting intermittent power generation capacity.
indicated that the overall project lending modality was appropriate, combining investment financing and capacity building support.

8. The project was correctly classified category B for environment and involuntary resettlement, and C for indigenous peoples. It was classified no gender elements. There was a gender-related target in the DMF—30% women trainees for renewable energy development, although disaggregated gender data for the 282 participants was unavailable.

D. Implementation Arrangements

9. The project implementation arrangement remained unchanged during the project’s preparation and implementation. The government was the borrower, and the Ministry of Power was the executing agency. CEB was the implementing agency for the T&D components—outputs (i) and (ii); Sri Lanka Sustainable Energy Authority (SLSEA) for the rooftop solar energy program—output iii; and ADB’s South Asia Department managed the knowledge and support TA—output (iv) through its energy division. CEB established four project management units (PMUs) for procurement and supervision of contract packages—three PMUs managed the implementation of the transmission lines and grid substations (GSS) and the fourth covered the distribution system. All PMUs were adequately staffed. SLSEA assigned a project director to implement the rooftop solar energy program, and an engineer and national consultant supported the director.

10. The PCR identified 63 covenants in the three loan and grant agreements, although several were included in more than one. CEB and SLSEA complied with all covenants, while partially complied with the covenants concerning the project website and the submission of the annual audited project financial statements (APFSs). The CEB webpage did not contain information on fund disbursements or implementation progress, while the annual APFSs were submitted from 2013 to 2019 and included the auditor’s opinion on the use of project funds, submissions were delayed, while a few of these were qualified by the auditor.

11. The DMF at appraisal identified several impact- and output-related risks. CEB’s cash generation may be insufficient for operations due to (i) increase in fuel costs and use of expensive thermal power generation, (ii) delays in commissioning of lower cost generation capacities, and (iii) tariff being set below the supply cost. The project may be confronted with unexpected increase in commodity and raw material prices, construction delays, and delayed approval of procurement proposals. CEB’s annual report indicated that the revenues from 2014 to 2018 exceeded sales cost only in 2015, mainly due to the tariff that had not reflected the supply cost to all consumer categories. CEB was able to maintain the operations with the help of government subsidy. The project cost was below the estimated, while the construction of some project components was delayed due to safeguard issues.

II. EVALUATION OF PERFORMANCE AND RATINGS

A. Relevance of Design and Formulation

12. The PCR rated the project relevant. It was consistent with the government’s development framework and ADB’s strategy and policies. The GSSs, transmission lines, and distribution networks (i) improved electricity supply in regions with electrification ratios lower than the national ratio, (ii) enabled evacuation of power from a large wind farm, and (iii) lowered T&D losses. The rooftop solar power generation and capacity building components increased renewable energy and strengthened institutional capacity for renewable energy development through a
series of workshops involving 282 participants. The project was implemented mainly as designed, with minor changes in location of the GSSs and the route of the transmission lines. The change in one 4 km route reduced the social impact, while it significantly delayed the major project component’s completion.\textsuperscript{12}

13. The PCR indicated two innovative features: (i) development and demonstration of private sector participation for rooftop solar power generation, and (ii) transmission line stringing accomplished using drones to lower environmental impacts in hilly and forested lands. Both practices were successful and were mainstreamed. This validation assesses the project relevant, based on its close alignment with government’s and ADB’s programs and strategies, and its overall design, including increasing the Mannar GSS’s capacity to evacuate power from its wind farm.

B. Effectiveness in Achieving Project Outcome and Outputs

14. The PCR rated the project effective since most components were completed by loan closing, although some 220 kV and 132 kV transmission lines were completed before the PCR was prepared. One outcome target was exceeded and three achieved. The reduced technical and commercial loss of CEB’s power system exceeded the targets where losses reduced to 9.6\% in 2016 (at 13.0\% target) and to 8.2\% in 2019 (at 12.0\% target). The transmission infrastructure connected the 100 MW Mannar wind farm in February 2020, although later than the December 2016 target;\textsuperscript{13} and 1.99 MW of solar power was connected to the grid by December 2017, almost double the target of 1.0 MW target, although it should have been connected in December 2014. The average voltage fluctuation at the end of the line was 4.8\%. The PCR indicated that 14 of the 16 output targets were fully achieved. The two targets not achieved were the construction of the solar research and development center, and two 132 kV transmission lines.

15. This validation notes that four subcomponents for the target outputs were incomplete at loan closing: (i) Mannar GSS was delayed due to a change in technical specifications—upgrade from 132 kV to 220 kV for power evacuation from Mannar wind farm; (ii) the 4.5 km section of the 73 km, 220 kV New Polpitiya–Pannipitiya transmission line in Magammana district was held up due to litigation related to rerouting; (iii) only two of the four 132 kV transmission lines—24 km out of 49 km—were completed; and (iv) construction of the solar research and development center was suspended. The Mannar GSS was completed and energized in February 2020, while the New Polpitiya–Pannipitiya transmission line was completed and was to be energized in April 2021. Two 132 kV transmission lines—the 10 km one was completed in March 2021, and although material was procured for the 15 km line, restringing was not undertaken since the alternate New Polpitita–Pannipitiya transmission line was delayed.

16. Three initial environmental examinations and environmental management plans were prepared and disclosed for five subprojects, as required.\textsuperscript{14} The grievance redress mechanism

\textsuperscript{12} A minor change in scope, approved in March 2018, added the construction of the solar research and development center, including the cost of equipment. However, the component was not implemented since ADB suspended procurement in March 2019 when SLSEA failed to submit on time its 2017 annual APFS, not complying with a loan covenant.

\textsuperscript{13} ADB. 2017. \textit{Report and Recommendation of the President to the Board of Directors: Proposed Loan, Ceylon Electricity Board: Wind Power Generation Project (Guaranteed by the Democratic Socialist Republic of Sri Lanka).} Manila. The transmission line and associated GSSs for power evacuation from Mannar wind farm were completed after the loan closing date. The financing for Mannar wind farm was only approved in September 2017, the site work commenced in March 2019, and according to monitoring reports for loan 3585, it was completed in December 2020.

(GRM) was inadequately described in the initial environmental examinations since the project relied on the standard GRM of the Public Utilities Commission of Sri Lanka (PUCSL). Impacts and risks on biodiversity were assessed and mitigation planned. In general, there were few biodiversity sensitive environmental features at project sites. Site selection for the substations and the transmission line routes avoided protected areas. Reforestation—two trees were planted for every tree removed—also took place. Impacts on water and air pollution were minimal. Pollution prevention and abatement met ADB’s requirements and complied with Sri Lanka’s environmental, health, safety, and social requirements. However, environmental monitoring reports did not include data on pollution prevention nor health and safety. The project had a positive impact on energy efficiency, and greenhouse gas emissions were mitigated through lower distribution losses and increased renewable energy supply.

17. The original resettlement plan of October 2014 was updated thrice in 2017 and 2018. The project affected 112 persons since they lost more than 10% of productive assets and incurred economic losses, although they were not displaced. Nine persons were affected through noncompliance with ADB policy on the compensation payment prior to economic displacement. There were some 115 representations made to the PUCSL and other authorities against the construction of transmission lines, all of which were eventually resolved. ADB suspended disbursement for Kegalle and New Polpitiya GSSs until progress on compensation payments was made. CEB failed to consult affected people on the route for a 4.5 km section of the New Polpitiya–Pannipitiya transmission line.

18. Safeguard issues with New Polpitiya–Pannipitiya 220 kV transmission line implementation surfaced in early 2014. Residents of densely populated Niyandagala village in Homagama area sought rerouting of 4.5 km stretch due to its high social impact, including the loss of residential and other structures. Responding to the complaint, the district administration recommended in March 2014 that an alternate route be considered to minimize the adverse impacts. After considering several alternatives in December 2014, CEB identified a 1.5 km longer route that passed through Magammana village, which was expected to have the least economic, environmental, and social impacts. The district administration endorsed this route. They subsequently, CEB obtained conditional clearance for the new Magammana route. Notices were served in June 2015 to those affected by the new route and were required to communicate a no objection, or object, propose, or make an alternate suggestion. At this stage, the complainants organized as Magammana community-based organization (CBO) submitted the complaints to the PMU, district administration, PUCSL, CEB management, and other government officials. The PCR indicated that the complaint’s essence was that due process, proper communication, and adequate consultation were not carried out when the route was changed from Niyandagala to Mangammana village. The CBO submitted the complaint to ADB’s Sri Lanka Resident Mission in November 2016 and to the Office of the Special Project Facilitator (OSPF) in August 2017. The

15 The PCR (Appendix 4) included a table that compared the main impacts (line length, affected houses under the line, affected houses within 35-meter right-of-way, and estimated cost) of three alternate routes, i.e., through Magammana, Jambugasmulla paddy field (CBO proposal), and Niyandagala (route examined in the initial environmental examination). The CBO proposal involved four houses in the right-of-way compared to five in the Magammana route, the route length increased from 6 km to 10 km, and the cost rose from SLR185 million to SLR316 million.

16 The OSPF fielded three missions in 2017–2018 and engaged a domestic communication and consultation expert to resolve the issue. CEB suspended the line’s construction in the disputed area, while OSPF facilitated an agreement between the parties. Initially it was agreed to undertake an independent analysis of alternate routes and development a consultation strategy. Later, the CBO did not agree to discussions with CEB until the evaluation of alternatives was completed. However, CEB was unwilling to evaluate alternatives fearing it would undermine its position on ongoing litigation. The Supreme Court decision was delayed and withdrawal from the ADB loan could not be made for new works after 30 June 2019. OSPF informed the CBO and other parties in July 2019 that the case was being closed,
CBO also initiated legal proceedings in the district court in July 2017. However, the Supreme Court dismissed the objections in December 2020 and allowed CEB to construct the transmission line. The construction of one circuit was completed in January 2021 and the second was expected to be complete in April 2021. This validation, however, did not have a confirmation regarding completion of construction, or if both circuits were in use.

19. Although delayed by about 3 years, the project accomplished its intended outcome, and achieved its quantitative outcome and output targets. Safeguard performance initially was problematic due to the failure to pay compensation prior to displacement and the selection of an alternate route for the transmission line through Magammana village. However, no household was displaced, all affected persons were compensated, and the GRM according to PUCSL standards was satisfactory. Other than two minor components with an estimated cost of less than $7 million, all works were completed. Where complaints were raised, these were settled through negotiation, although one case went to litigation.17 The project neither resulted in environmental degradation, nor negatively affected project communities.18 Based on the achievement of the outcome and output indicators and the eventual resolution of all safeguard issues, this validation assesses the project effective.

C. Efficiency of Resource Use

20. The PCR rated the project efficient. The economic internal rate of return (EIRR) was reevaluated following the same methodology at appraisal, using actual costs and benefits at completion. Outputs (i), (ii), and (iii), and the overall project were assessed separately. Actual project costs were obtained from the audited APFSs and stated in constant 2020 SLRs. A shadow exchange rate factor of 1.07 was used for all traded goods and services, and a shadow wage rate factor of 0.33 for local labor. Taxes, duties, and financial charges were excluded from costs. Operation and maintenance (O&M) costs were assumed at 1.5% of the transmission line’s capital cost, 2% for T&D assets, and 0.5% for rooftop solar systems. The incremental power generation cost was based on the average fuel cost and the variable O&M cost of 2% of the fuel cost. The non-incremental economic benefit resulted from reduction in the T&D loss and the renewable energy which the project evacuated. T&D loss was valued at the fuel and variable O&M cost of avoided thermal power generation. The environmental benefit—avoided carbon dioxide (CO2) emission—was valued at the social cost of $36.3 per ton of CO2 in 2016 price and a reduction of 8 liter of kerosene per household in previously unelectrified households. The incremental benefit, valued at the willingness-to-pay, resulted from increased consumption of electricity. For output (i), the incremental electricity supply was based on the demand forecast for Mannar GSS, O&M loss reduction, and 10% of the output of the Mannar wind farm—ratio of the capital cost of the wind farm and associated transmission system. The incremental benefit of output (ii) was based on the demand forecast of Thulhiriya GSS and districts that the distribution lines served. The power generation from the rooftop solar system was estimated using a capacity factor of 17% and annual capacity degradation of 0.5%. It was valued at the displaced thermal power generation cost.

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17 ADB. 2020. *Project Administration Instructions, PAI 5.08 for Project Performance Monitoring*. The PCR and the validation have not lowered the effectiveness rating since achievement of the output targets was delayed. According to ADB’s recent project administration instructions, an output is given a score of 1 (“on track”) when over 85% of the quantitative target has been achieved and a delay was significant only during project implementation for rating it “for attention” or “at risk”.

21. The reevaluated EIRR was 18.7% for output (i), 12.9% for output (ii), 13.6% for output (iii), and 14.3% for the overall project, against 12.2% at appraisal. All were above the 12% hurdle rate.\textsuperscript{19} The reduction of benefits, due to the delay in project completion, was compensated by the much lower capital cost. This validation considers the approach, assumptions, and method for reevaluation reasonable, and noted the adoption of a conservative assumption for incremental sales—only about 5% of the additional substation capacity in 2023, and the social cost of carbon was used to the estimated negative environmental benefits, although not for the fuel price used to determine willingness-to-pay. The project was sensitive to increases of O&M cost from 1.5% of capital cost to 2.5%, where the EIRR fell to 12.5%. However, the EIRR was higher than 12.0%. This validation assesses the project efficient.

D. Preliminary Assessment of Sustainability

22. The PCR rated the project likely sustainable. The financial internal rate of return (FIRR) and the weighted average cost of capital (WACC) were reevaluated separately for the three physical outputs and the overall project. The FIRR was 10.99% at appraisal. The PCR valued the electricity sales using the PUCSL-approved tariff methodology and the project investment. The annual revenue was estimated as the sum of O&M cost, depreciation, loan interest, return of 2% of the fixed assets, change in working capital, and taxes. The power that the rooftop solar system generated was valued at the average CEB tariff of SLR16.4 per kilowatt-hour. For output (i), the recomputed FIRR was 5.91% against a WACC of 4.80%; for output (ii), 6.09% against a WACC of 4.80%; for output (iii), 12.55% against a WACC of 7.75%; and for the overall project, 6.16% with the WACC of 4.85%. CEB operated under a regulatory regime that allowed the recovery of all financial costs. However, government policy required them to supply electricity to consumers with a low-level consumption, and a tariff below the cost-recovery level. The revenue shortfall was to be made up from the government’s subsidy.

23. The approach, assumptions, and method for the FIRR reevaluation were considered appropriate and the project FIRR was greater than the WACC. However, the subsidy to CEB was not regularly remitted. This was estimated to be SLR60 billion compared to the total revenue of SLR230 billion and an operating loss of SLR29 billion in 2018—the latest year CEB disclosed its APFSs.\textsuperscript{20} However, the risk was considered manageable, since CEB is wholly government-owned and is required to maintain electricity supply. The Electricity Act 2009 required the government to meet CEB’s revenue gap and subsidy payments were being monitored under ongoing projects.\textsuperscript{21} Since the FIRR exceeded WACC, and the overall financial performance risk was considered manageable, this validation assesses the project likely sustainable.

III. OTHER PERFORMANCE ASSESSMENTS

A. Preliminary Assessment of Development Impact

24. The PCR rated the project’s development impact satisfactory. It expanded and strengthened T&D networks, and improved electricity supply to about 123,500 consumers. Improved power increased economic opportunities and encouraged poverty reduction in the conflict-affected areas and in Sabaragamuwa Province’s Kegalle District. The rooftop solar systems successfully piloted an innovative approach for investment by 22 private sector

\textsuperscript{19} The project team shared the calculations for the reevaluation that had a slightly different estimate of incremental benefits and, consequently, a negative environmental benefit for output (ii).


enterprises, which was adopted in the national Battle for Solar Energy Program that aims to add 1,000 MW of rooftop solar capacity by 2025. The accomplishments against the four impact targets varied. First, the 2020 targeted supply capacity was 6,367 MW. The actual amount was 4,434 MW in 2019 and only expected to be 4,989 at end-2020, thus, the target was not achieved. In 2018, CEB lowered the target to 5,317 MW and the actual capacity would be 94% of this, and the PCR considered the target to be achieved. Second, the targeted electrification ratio of 100% by 2015 was achieved in 2016. Third, although the targeted share of renewable energy supply was 20.0% by 2020, it was only 11.2% in 2018. It was expected to increase to 18.4% by end-2020, thus, it was on-track to achieving the target. The target for the additional new renewable energy capacity of 500 MW by 2015 was exceeded. The baseline was 123 MW in 2007 and total capacity was 1,245 MW by 2020, an addition of 1,122 MW. The project also resulted in CO2 emissions reduction of 77,680 tons per year with an energy saving of 85.6 gigawatt-hour per year. Considering these achievements, this validation assesses the development impact of the project satisfactory.

B. Performance of the Borrower and Executing Agency

25. The PCR rated the overall performance of the borrower and executing agencies satisfactory. Contracts were awarded as scheduled despite the delay in loan effectiveness. CEB implemented outputs (i) and (ii) without assistance from consultants using its in-house engineers to supervise implementation of the nine turnkey contract packages. CEB demonstrated competence in managing complex technical matters of power system design and ADB supported the safeguard-related work related to five complaints for three contract lots. SLSEA implemented the rooftop solar system successfully, ranking bids from private sector enterprises using an innovative approach. Instead of ranking bids based on bid prices, it considered three aspects: (i) required capital subsidy grant, (ii) geographical spread, and (iii) wide coverage business categories for high visibility. A participating financial institution administered the credit line and extended 7-year loans for rooftop solar systems. The capital grant subsidy was provided from the CEF according to actual power generation. Although CEB and SLSEA delayed the submission of annual APFSs, the executing and implementing agencies remained fully committed and addressed shortfalls during project implementation, e.g., resolution of the dispute linked to delayed compensation payments. Draft project completion reports were submitted for all contract packages. This validation assesses the performance of the borrower and the executing and implementing agencies satisfactory.

C. Performance of the Asian Development Bank

26. The PCR rated ADB’s performance satisfactory. ADB conducted two procurement reviews, an inception mission, and 11 review and 1 project completion review missions, totaling 288 person-days. Multiple visits to project sites helped identify potential implementation issues and address safeguard issues. Timely approvals on the reallocation of loan funds facilitated prompt disbursements. This validation notes that ADB resident mission and the OSPF worked with CEB to resolve safeguards complaints. Furthermore, ADB suspended implementation when

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23 Of the five complaints, three sought transmission lines realignment. The proposed routes were eventually followed in all cases—there was mutual agreement for two transmission lines, and through a Supreme Court ruling for the third. Two complaints were linked to the commencement of works before full compensation payment for economic displacement—in one case, ADB suspended disbursement until the affected peoples were satisfied.
24 Over 100 private sector entities submitted bids, of these 22 were selected to implement 1,791 kW rooftop solar power generation capacity.
CEB did not comply with safeguard policies. Overall, this validation assesses ADB’s performance satisfactory.

IV. OVERALL ASSESSMENT, LESSONS, AND RECOMMENDATIONS

A. Overall Assessment and Ratings

27. The PCR rated the project successful. It was relevant, effective, efficient, and likely sustainable. Although implementation was delayed, outputs were achieved at a lower cost. This validation assesses the project relevant based on the close alignment with government’s and ADB’s program and strategies. It was effective as the outcome and output targets were achieved. It was efficient since the EIRR was above 12% and likely sustainable as the FIRR exceeded the WACC. This validation assesses the project successful overall.

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B. Lessons

28. The PCR identified five lessons: (i) the transmission line route should be finalized before a contract award;25 (ii) PMUs need trained safeguard staff to consult affected peoples when a project site is changed; (iii) the use of drones helped install transmission lines in areas that were difficult to access; (iv) the innovative approach for ranking proposals for rooftop solar installations demonstrated the benefits of competitive bidding; and (v) engaging a financial management officer in the resident mission improved implementing agencies’ financial reporting at project closing. This validation supports these lessons, although notes some caution related to the contract award for the transmission lines.

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25 The validation views that project preparation cost and time may become excessive if a detailed survey was always required for a proposed long transmission line route through inaccessible areas. When turnkey contracts are used, the common practice was to award the contract based on an indicative route, which was also used to examine safeguard aspects. A detailed survey and finalization of transmission line design was then included in the contract’s scope. Therefore, affected people’s complaints may not be completely avoidable when the detailed survey was completed, and actual route determined. The project implementation arrangement for transmission lines always needs to include suitable mechanisms and trained staff to manage communications and consultation with affected peoples and resolve complaints in a timely manner.
29. This validation offers two additional lessons.

(i) **Project-level lesson.** The use of drones for conductor stringing in inaccessible areas could become the preferred industry practice, while providing a capital subsidy for nascent proven technologies based on competitive bidding would help mainstream climate-friendly practices in developing member countries. The benefit of these innovative features goes well beyond the project’s boundaries.

(ii) **Sector-level lesson.** In its early stages, combining international expertise under an associated knowledge and support TA with an investment grant helps develop renewable energy resources. The TA helped address concerns regarding intermittent nature of wind and solar power generation, developed the renewable energy master plan and business model, and prepared grid codes for connecting intermittent power generation sources, while the CEF grant provided resources for the installation of rooftop solar systems.

C. Recommendations for Follow-Up

30. The PCR recommended that CEB should (i) carry out an advanced detailed design of transmission line projects, (ii) form a land acquisition and resettlement committee to address grievances, (iii) establish an environmental and social safeguard unit, and (iv) monitor project impacts and ensure proper maintenance of facilities and infrastructure. While ADB should (i) follow up on the remaining construction work at Magammana, (ii) assess the grievance redress practices, (iii) provide additional safeguards training for CEB staff, and (iv) monitor progress in establishing the safeguard unit and the implementing agencies’ financial management compliance.

V. OTHER CONSIDERATIONS AND FOLLOW-UP

A. Monitoring and Reporting

31. CEB and SLSEA monitored implementation and submitted all required progress and safeguard reports. The PCR indicated that the quarterly and project completion reports were submitted on time. However, the annual APFSs were late by an average of 5 months for CEB and 13 months for SLSEA.²⁶

B. Comments on Project Completion Report Quality

32. The PCR was circulated within 12 months of financial closing. It comprehensively described and objectively assessed the project outcome, outputs, and achievement of targets. The DMF was improved to better reflect the intent of the original one. Appendixes provided details of achievements against output targets and comprehensively described the litigation and ADB’s response to the New Polpitiya–Pannipitiya transmission line. The PCR outlined the innovative process used to implement the rooftop solar system. Environmental and social safeguards were appropriately discussed. The PCR presented the methodology and assumptions used to reevaluate EIRR and FIRR, and supporting calculations were well structured and shared for review. No ratings were changed. This validation assesses the PCR quality satisfactory.

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²⁶ The PCR did not explain the reason for the delay in submission of annual APFSs. The National Audit Office of Sri Lanka carried out the audit. Based on information in another Sri Lanka power sector project (Loan 2518), there was a prolonged process for Parliament ratification before the reports could be disclosed.
C. Data Sources for Validation

33. Data sources used for this validation included the report and recommendation of the President, the PCR, loan review mission reports, and other external reports cited.

D. Recommendation for Independent Evaluation Department Follow-Up

34. The PCR recommended preparing the project performance evaluation report after finalizing the PCR. However, this validation finds insufficient justification for such a report.