



Report and Recommendation of the President to the Board of Directors

Project Number: 49345-002
September 2017

Proposed Loan Ceylon Electricity Board Wind Power Generation Project (Guaranteed by the Democratic Socialist Republic of Sri Lanka)

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 1 September 2017)

Currency unit	–	Sri Lanka rupee/s (SLRe/SLRs)
SLRe1.00	=	\$0.006545
\$1.00	=	SLRs152.78

ABBREVIATIONS

ADB	–	Asian Development Bank
CEB	–	Ceylon Electricity Board
EIA	–	environmental impact assessment
EMP	–	environmental management plan
FBU	–	functional business unit
ha	–	hectare
kV	–	kilovolt
MVA _r	–	megavolt-ampere reactive
MW	–	megawatt
PAM	–	project administration manual
PMU	–	project management unit
PUCSL	–	Public Utilities Commission of Sri Lanka

NOTE

In this report, “\$” refers to US dollars.

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PROJECT AT A GLANCE

1. Basic Data		Project Number: 49345-002	
Project Name	Wind Power Generation Project	Department /Division	SARD/SAEN
Country Borrower	Sri Lanka Ceylon Electricity Board	Executing Agency	Ceylon Electricity Board
2. Sector		ADB Financing (\$ million)	
✓ Energy	Subsector(s) Renewable energy generation - wind		200.00
		Total	200.00
3. Strategic Agenda		Climate Change Information	
Inclusive economic growth (IEG) Environmentally sustainable growth (ESG)	Subcomponents	Adaptation (\$ million)	2.00
	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation (\$ million)	198.00
	Eco-efficiency	CO ₂ reduction (tons per annum)	265,700
	Global and regional transboundary environmental concerns	Climate Change impact on the Project	Medium
4. Drivers of Change		Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Client relations, network, and partnership development to partnership driver of change	No gender elements (NGE)	✓
Knowledge solutions (KNS)	Institutional development Application and use of new knowledge solutions in key operational areas		
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	No	Nation-wide	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG7, SDG13		
6. Risk Categorization:		Complex	
7. Safeguard Categorization		Environment: A Involuntary Resettlement: B Indigenous Peoples: C	
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		200.00	
Sovereign Project (Regular Loan): Ordinary capital resources		200.00	
Cofinancing		0.00	
None		0.00	
Counterpart		56.70	
Government		56.70	
Total		256.70	

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan to the Ceylon Electricity Board (CEB) to be guaranteed by the Democratic Socialist Republic of Sri Lanka for the Wind Power Generation Project.

2. The project includes (i) wind power generation development—consisting of construction of (a) 100 megawatts (MW) wind farm; (b) wind park internal infrastructure, internal cabling, and access roads and other arrangements; and (c) a renewable energy dispatch control center to forecast, control, and manage intermittent wind power generation; (ii) improvement of power system reactive power management; and (iii) project engineering design review and supervision support in Mannar Island of the Northern Province.

II. THE PROJECT

A. Rationale

3. Sri Lanka's energy sector performance has achieved a national electrification ratio of 99.3% (2016) up from 29% in 1990.¹ However, the sector continues to struggle in meeting the growing demand for electricity at sufficiently low cost and acceptable reliability. The share of thermal power in the generation mix remains high at 67.2% in 2016 as the entire demand growth has been served by oil-fired thermal (31.5%) and coal (35.7%) generation. Although 32.8% of the total generated power provided to the grid in 2016 was from renewable sources, including 24.6% large hydropower, 5.2% small hydropower, 2.4% wind power, and 0.6% other sources, the high share of oil-fired thermal generation makes electricity expensive due to high fuel prices, and poses a serious threat to the country's energy security and the environment.² There is an urgent need to develop other clean energy sources in addition to hydropower, undertake loss reduction efforts, and address energy efficiency issues. Diversification to renewable energy sources, such as wind and solar energy, will improve the country's energy security and the environment.

4. Developing wind power generation by both the public and private sectors and through public-private partnerships provides substantial opportunities to reach the country's goal of increasing the share of nonconventional renewable energy generation to 20% of the total generated power by 2020.³ In 2016, total installed wind power generation capacity in Sri Lanka was 131 MW, of which 128 MW were constructed by the private sector. This wind power generation capacity allowed the production of 343 gigawatt-hours. The feed-in-tariff for wind power of about SLRs23 per kilowatt-hour that is applicable to wind power plants with capacity of up to 10 MW is considered high compared with the world standards. This could be reduced if, instead of the feed-in-tariff, a competitive bidding is applied for new wind power installations.

5. The Government of Sri Lanka aims to ensure the sustainable development of energy resources by improving the power supply systems to guarantee that the entire population has access to electricity services. Sri Lanka has a national sector investment program that is based on the National Energy Policy and Strategies of Sri Lanka.⁴ The policy and strategies include a sector road map, and policy and reform measures. To reduce the current high cost of thermal

¹ Ceylon Electricity Board. 2017. *Statistical Digest 2016*. Colombo.

² The year 2016 was a dry year with substantially less rains that resulted in the decrease of hydropower generation with corresponding increase in oil-fired generation.

³ Government of Sri Lanka. 2015. *Sri Lanka Energy Sector Development Plan for a Knowledge Based Economy 2015–2025*. Colombo. Nonconventional renewable energy includes mini hydro up to 10 megawatts (MW), wind, solar, biomass, tide, and geothermal power generation sources.

⁴ Government of Sri Lanka. 2008. *National Energy Policy and Strategies of Sri Lanka*. Colombo.

power generation and attain cost recovery, the government developed 900 MW of low cost coal-fired capacity that became fully operational in 2014. The government aims to increase supply capacity from renewable energy sources and potential future conversion of the oil-fired plants to gas-fired plants. The policies and incentives for developing renewable energy sources exist in the country. The increase to 20% of power generation from nonconventional renewable energy sources, including their current generation, will be in addition to 24.6% (2016) of conventional hydropower and will ensure that, in the future, a substantial portion of electricity is generated by domestic clean energy sources. This will address the critical issue of energy security.

6. **Value added by ADB assistance.** The project will contribute to the government's goal of expanding access to electricity and developing clean energy.⁵ This innovative, high technology project represents the development of the first 100 MW wind park in Sri Lanka.⁶ It will create an enabling environment for wind power development through the use of a public–private partnership approach in the future. The project will (i) build CEB's capacity to act as a wind park developer to attract the private sector in future wind power generation through competitive bidding; (ii) help to benchmark capital and operational costs to be used in competitive bidding for private sector wind power development projects; and (iii) improve CEB's capacity to forecast, control, and manage intermittent renewable energy in the power system through dedicated control centers. The project will also help to continue an ongoing and essential dialogue with the government on pursuing power subsector reforms in coordination with other interested parties and development partners.

7. The project is consistent with the Asian Development Bank's (ADB) country partnership strategy for Sri Lanka.⁷ It has strong grounds on previous ADB interventions focused on supporting investments in power transmission and distribution to expand access to clean and reliable electricity and renewable energy development.⁸ The project considers lessons relating to grid integration of renewable energy and strengthening CEB's capacity in complex project supervision from the previous projects, and incorporates them in improved implementation arrangements and project design. It will support the sustainable development of the energy sector

⁵ The project is included in ADB. 2017. *Country Operations Business Plan: Sri Lanka, 2018–2020*. Manila.

⁶ A project preparatory technical assistance (ADB. 2016. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for Preparing the Wind Power Generation Project*. Manila [TA 9085-SRI]) was approved on 18 March 2016 for \$2,000,000 to be financed on a grant basis by the Clean Energy Fund (financing partners: the governments of Australia, Norway, Spain, Sweden, and the United Kingdom) under the Clean Energy Financing Partnership Facility and administered by ADB. The technical assistance also includes capacity building of CEB to handle development of future wind power projects with private sector participation (Capacity Building of Ceylon Electricity Board as a Wind Park Developer for Private Sector Involvement in Wind Power Generation, accessible from the list of linked documents in Appendix 2).

⁷ ADB. 2017. *Country Partnership Strategy: Sri Lanka, 2018–2022—Transition to Upper Middle-Income Country Status*. Manila.

⁸ ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loans, Technical Assistance Grant, and Administration of Grant to the Democratic Socialist Republic of Sri Lanka for the Clean Energy and Network Efficiency Improvement Project*. Manila, funds transmission and medium voltage infrastructure, including for the evacuation of power from a proposed wind park. Tranche 2 of ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranches Financing Facility to the Democratic Socialist Republic of Sri Lanka for the Green Power Development and Energy Efficiency Improvement Investment Program*. Manila, finances, along with other components, transmission infrastructure enhancement, including the last transmission link (Mannar–Nadukuda) for power evacuation from the proposed wind park. Under ADB's project preparatory TA (ADB. 2011. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for Preparing the Clean Energy and Network Efficiency Improvement Project*. Manila [TA 7837-SRI]), ADB supported actual wind measurements and wind resource assessment at the proposed 100 MW wind park site at Mannar, Northern Province. A power system stability study and a master plan of the proposed wind park, were prepared with the support of ADB. 2012. *Technical Assistance for the Democratic Socialist Republic of Sri Lanka for Capacity Building for Clean Power Development*. Manila (TA 8167-SRI).

of Sri Lanka in line with the national and sector priorities and ADB's country partnership strategy, and will complement activities of other major development partners.⁹

B. Impact and Outcome

8. The project is aligned with the following impact: access to clean and reliable power supply in Sri Lanka enhanced by 2025 (footnote 3). The project will have the following outcome: clean power generation increased.¹⁰

C. Outputs

9. **Output 1: Wind power generation capacity increased.** This output consists of three subcomponents: (i) 100 MW wind power park constructed in Mannar Island in the Northern Province;¹¹ (ii) wind park infrastructure developed that involves construction of the wind park's internal medium voltage infrastructure, internal cabling, access roads, and other arrangements; and (iii) a renewable energy dispatch control center established to forecast, control, and manage intermittent 100 MW wind power generation.¹²

10. **Output 2: System reactive power management improved.** This includes installation of 100 megavolt-ampere reactive (MVAR) reactors at the 220 kilovolt (kV) level at the Anuradhapura grid substation in the North Central Province, and a 50 MVAR reactor at the 220 kV level at the Mannar grid substation in the Northern Province to manage voltage levels within the planning limits and practical operational requirements, and ensure reliable operation of the wind park.

11. **Output 3: Capacity of CEB in project engineering design review and supervision strengthened.** Expert consultancy services will be procured to strengthen CEB's capacity in project engineering design, review, and supervision. These advisory consultancy services will assist CEB in ensuring engineering oversight of wind turbine installation, commissioning and testing activities, and technical certification of contractor's activities throughout the construction period.

D. Summary Cost Estimates and Financing Plan

12. The project is estimated to cost \$256.7 million (Table 1).

13. Detailed cost estimates by expenditure category and by financier are included in the project administration manual (PAM).¹³ The expenditure categories will include turnkey contracts for the wind plant, consisting of the 100 MW wind farm, internal infrastructure, and a renewable energy dispatch control center, the 150 MVAR reactors, and consultancy services for the project engineering design review and supervision.

⁹ ADB continuously coordinates with major development partners in Sri Lanka, including Agence Française de Développement, the Japan International Cooperation Agency (JICA), and the World Bank. JICA is planning to finance the construction of a pumped storage in 2020 that would allow using wind power generated during off-peak hours for storing hydroelectric energy for load balancing rather than curtailing generation at the proposed wind park and other generation facilities.

¹⁰ The design and monitoring framework is in Appendix 1.

¹¹ Mannar Island was identified as high wind resource potential area based on studies of the National Renewable Energy Laboratory (USA), Sustainable Energy Authority of Sri Lanka, and actual wind measurements and wind resource assessment at the proposed site financed by ADB's TA for Preparing the Clean Energy and Network Efficiency Improvement Project at the government's request (footnote 8).

¹² Detailed Description of Project Outputs (accessible from the list of linked documents in Appendix 2).

¹³ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

Table 1: Summary Cost Estimates
(\$ million)

Item	Amount ^a
A. Base Cost^b	
1. Output 1: Wind power generation capacity increased	196.8
2. Output 2: System reactive power management improved	19.1
3. Output 3: Capacity of Ceylon Electricity Board in project engineering design and supervision strengthened	1.0
Subtotal (A)	216.9
B. Contingencies^c	27.4
C. Financing Charges During Implementation^d	12.4
Total (A+B+C)	256.7

^a In first quarter 2017 prices.

^b Includes taxes and duties of \$43.7 million to be financed from Ceylon Electricity Board resources. Such amount does not represent an excessive share of the project cost.

^c Physical contingencies calculated at 5% of base costs. Price contingencies calculated using the Asian Development Bank's forecasts of international and domestic inflation. Includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

^d Interest during implementation for the ordinary capital resources loan has been calculated at the 5-year US dollar fixed swap rate plus an effective contractual spread of 0.5% and zero maturity premium. Commitment charges are 0.15% per year to be charged on the undisbursed loan amount.

Sources: Ceylon Electricity Board and Asian Development Bank estimates.

14. CEB has requested a regular loan of \$200 million from ADB's ordinary capital resources with a sovereign guarantee to help finance the project. The loan will have a 20-year term, including a grace period of 5 years; an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; a commitment charge of 0.15% per year; the interest and other charges during construction to be capitalized in the loan; and such other terms and conditions set forth in the draft loan agreement. Based on the straight-line repayment method,¹⁴ the average maturity is 12.75 years, and there is no maturity premium payable to ADB.

15. The summary financing plan is in Table 2. ADB will finance the expenditures in relation to the project's base cost of all outputs, excluding taxes and duties, and a portion of contingencies. CEB will finance taxes and duties, a portion of contingencies, and incremental costs (e.g., land acquisition, environmental and social mitigation, and counterpart support).

Table 2: Summary Financing Plan

Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank		
Ordinary capital resources (regular loan)	200.0	77.9
Ceylon Electricity Board	56.7	22.1
Total	256.7	100.0

Source: Asian Development Bank estimates.

16. Climate mitigation is estimated to cost \$254.1 million and climate adaptation is estimated to cost \$2.6 million. ADB will finance 77.9% of mitigation costs and 76.9% of adaptation costs. Details are in the PAM.

¹⁴ Based on the above loan terms and the Ceylon Electricity Board's choice of repayment option and dates.

E. Implementation Arrangements

17. CEB will be the executing and implementing agency. A steering committee, chaired by the secretary of the Ministry of Power and Renewable Energy, will guide CEB and review progress and results. CEB will set up a project management unit (PMU). The PMU will oversee procurement, disbursement, financial management and accounting, quality assurance, social, and environmental issues, and will coordinate with the procurement committee, appointed by the cabinet or the Ministry of Power and Renewable Energy, depending on the contract size. Full-time managers will supervise each project output under the project.

18. The government and CEB have asked ADB to approve advance contracting for procurement of goods and civil works, including preparing bidding documents, and inviting and receiving bids for contracts, and retroactive financing under the project. Retroactive financing will be allowed for up to 20% of the loan amount for expenditures incurred prior to loan effectiveness. The government and CEB were advised that ADB's approval of advance contracting and retroactive financing in principle does not commit ADB to finance any part of the project.

19. The implementation arrangements are summarized in Table 3 and described in detail in the PAM.

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	1 January 2018–31 December 2021		
Estimated completion date	31 December 2021		
Estimated loan closing date	30 June 2022		
Management			
(i) Oversight body	Steering committee consisting of the secretary, MPRE (chair) and representatives of MDA, MNPEA, MOFMM, MPRE, and CEB		
(ii) Executing agency	CEB		
(iii) Key implementing agencies	CEB		
(iv) Project management unit	Established in CEB		
Procurement ^a	International competitive bidding	2 contracts	\$172.6 million
Consulting services	Firm (QCBS)	1 consulting contract	\$1.0 million
Retroactive financing and/or advance contracting	Advance contracting, including preparation of bidding documents, inviting and receiving bids for contracts, and retroactive financing of up to 20% of the loan amount for expenditures incurred prior to loan effectiveness, but no earlier than 12 months before the signing of the loan agreement.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed between CEB and ADB.		

ADB = Asian Development Bank, CEB = Ceylon Electricity Board, MDA = Ministry of Development Assignments, MNPEA = Ministry of National Policies and Economic Affairs, MOFMM = Ministry of Finance and Mass Media, MPRE = Ministry of Power and Renewable Energy, QCBS = quality- and cost-based selection.

^a Excludes local taxes and duties.

Source: Asian Development Bank.

III. DUE DILIGENCE

A. Technical

20. The project will use modern, proven wind power generation technologies and innovative approaches in forecasting, controlling, and managing intermittent renewable energy in the power system through the dedicated control center. CEB conducted technical studies for the proposed outputs with support from the consultants engaged under the project preparatory technical assistance financed by ADB (footnote 6). ADB followed up with its own assessment and found the technical studies generally acceptable. The work undertaken indicates that the proposed technical solutions are feasible and execution arrangements are satisfactory.

B. Economic and Financial

21. An evaluation of the economic viability of the project and its expected economic performance was undertaken through a cost-benefit analysis, by comparing with- and without-project scenarios, and conducted using ADB guidelines for economic analysis.¹⁵ Economic analysis was carried out at the output level. All project outputs have been confirmed as least cost, with sound economic rationale for investment. The main economic benefits identified, quantified, and valued include additional clean power generation and improvements through better reactive power management. The aggregate economic internal rate of return of the project was estimated at 16.6%; above the assumed economic hurdle rate of 9%. Various scenarios were modeled to test the sensitivity of estimated economic returns to key assumptions. In all cases, the aggregate economic internal rate of return exceeded the 9% hurdle rate, reflecting the project's expected robust economic performance.

22. Financial viability of the proposed investment was examined by comparing the incremental costs and benefits on a with- and without-investment basis in accordance with ADB's guidelines for financial management and analysis of projects.¹⁶ The overall internal rate of return of the three outputs was estimated at 4.2%, which compares favorably with the project's weighted average cost of capital of 2.6%. Sensitivity analysis was also undertaken to test the robustness of the project's financial performance, and preliminary results indicate that the overall investment remains viable under scenarios modeled.

C. Governance

23. CEB is one of two power utilities in the country. CEB is a vertically integrated utility comprising six functional business units (FBUs). The Sri Lanka Electricity Act, 2009 encourages efficiency improvements of CEB by regulating each FBU. The act empowers the Public Utilities Commission of Sri Lanka (PUCSL), an independent regulator for energy and water established under the PUCSL Act, 2002, to regulate the electricity supply industry. PUCSL regulates each FBU separately under individual licenses. Financial accounts are segregated to allow each FBU to operate as a profit center, and a transfer-pricing scheme between FBUs was developed. However, the process of delegating day-to-day management and financial decision making to FBU heads is not complete and the transfer-pricing scheme is not functioning properly. PUCSL established a tariff methodology and a road map for tariff reforms and rebalancing.

¹⁵ Economic Analysis (accessible from the list of linked documents in Appendix 2).

¹⁶ Financial Analysis (accessible from the list of linked documents in Appendix 2).

24. CEB has the necessary capacity to undertake the project. It was the implementing agency for past ADB-financed projects and has managed investments funded by other development partners. The financial management assessment of CEB concludes that it can fulfill ADB's fiduciary requirements for the project. CEB regularly faces cash shortfalls because of low tariffs, expensive power generation, and expensive short-term loans. These shortcomings need to be corrected. Under the Sri Lanka Electricity Act, all tariffs must reflect costs; and Treasury will bear the cost of any government-approved subsidy. The tariff order issued by PUCSL in January 2011 increased the average electricity tariff by about 8%. In February 2012, PUCSL implemented a fuel adjustment formula for certain customer categories. In April 2013, retail electricity tariffs were increased by 35% on average. Subsequently, the government has converted CEB's long-term debt into equity.

25. The financial management capacity of CEB is assessed as acceptable for the project. The overall financial management risk is assessed as moderate and several risk mitigation measures will be implemented. Details of the financial management assessments of CEB are available in the PAM and in the assessment of CEB's financial performance and projections.¹⁷ CEB's financial performance has improved in 2013–2015, particularly in 2015 due to better rainfall and, thus, higher low-cost hydropower generation. However, lack of rains reduced hydropower generation and increased the average power generation cost in 2016. CEB's financial sustainability will depend on the extent to which the utility is allowed to charge its customers fully cost-reflective tariffs to service debt, and to undertake a prudent capital and operating expenditure program. The government intends to improve financial management and efficiency in CEB, and advance CEB internal reforms envisaged under the Sri Lanka Electricity Act. This is consistent with public financial management and state enterprise reforms agreed in June 2016 by the government with the International Monetary Fund as part of the 3-year program under the Extended Fund Facility to support the country's economic reform agenda.¹⁸

26. All procurement will be carried out in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). Recruitment of consultants will be in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). An oversight role by ADB will ensure integrity in procurement and implementation activities. CEB maintains a project website that will be updated regularly and includes (i) bidding procedures, bidders, and contract awards; (ii) use of funds disbursed under the project; and (iii) physical progress. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and CEB. The specific policy requirements and supplementary measures are described in the PAM.

D. Poverty, Social, and Gender

27. The project will contribute to sustainable economic development, poverty reduction, and social well-being through increased power supply from clean wind energy in Mannar Island. The project will ensure greater access to a stable supply of electricity to industrial and commercial customers and to the general public, which will promote business expansion and create employment opportunities to the local communities, including poor and socially disadvantaged people, during the implementation phase. The project is expected to generate jobs for skilled and unskilled laborers, including poor, vulnerable groups, and women, during construction. The use

¹⁷ The summary of CEB's historical financial performance and projections is provided in the Financial Analysis (accessible from the list of linked documents in Appendix 2).

¹⁸ International Monetary Fund. 2016. *Sri Lanka: Staff Report for the 2016 Article IV Consultation and Request for a Three-Year Extended Arrangement under the Extended Fund Facility—Press Release; Staff Report; Staff Statement, and Statement by the Executive Director for Sri Lanka*. Washington, DC.

of clean energy will improve urban and rural air quality, people's health, living conditions, and quality of life. A loan agreement will include a standard assurance related to the compliance with host country labor standards for contractors. Stakeholder dialogue and communications were carried out during the project design stage and will continue during implementation.

E. Safeguards

28. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguard categories are as follows.¹⁹

29. **Environment (category A).** The project is classified as environment category A due to its environmentally sensitive location on a migratory bird route and potential impacts.²⁰ Following ADB's Safeguard Policy Statement and national regulations, a draft environmental impact assessment (EIA), including an environmental management plan (EMP), was prepared and disclosed in ADB's website on 18 May 2017. Any update of the EIA resulting from a change in project scope will be similarly disclosed. Mitigation measures are proposed in the EIA and EMP to minimize habitat and species disturbance, and impact on fishermen's livelihood, health, and safety as a result of project construction, noise, shadow flicker and visual impacts, and potential bird collision with the wind turbines during operation.²¹ Implementation of the biodiversity management plan that is being developed will ensure no net loss of biodiversity at the wind power generation site.²² Public consultations and focus group meetings were conducted with local communities, fishermen, women, government authorities, and nongovernment organizations, including ornithological societies. Their feedback was taken into account during the project design. Public concerns are identified in the EIA, and mitigation measures are incorporated into the EMP. The PMU has dedicated environment specialists for monitoring environment issues and implementing the EMP.

30. CEB has implemented several ADB projects, including category A projects,²³ and has adequate institutional capacity and experience to manage environmental risks during preconstruction, construction, and operation. The EMP will be incorporated into civil works contracts, giving contractors the primary responsibility for implementation during construction. CEB will supervise construction and EMP implementation. CEB will provide environmental monitoring reports to ADB quarterly during construction and annually during operation, and retain qualified external experts or nongovernment organizations to verify monitoring information of the project for the environment. A corrective action plan will be prepared and implemented for any unanticipated environmental impacts and noncompliance issues. The contractors and CEB will adhere to ADB's Safeguard Policy Statement and national environmental regulations. In the event

¹⁹ ADB. Safeguard Categories. <https://www.adb.org/site/safeguards/safeguard-categories>.

²⁰ Environmental Impact Assessment (accessible from the list of linked documents in Appendix 2).

²¹ The final design will be completed by an engineering, procurement, and construction contractor with experience in wind power project development. The contractor will be required to minimize potential impacts under supervision of CEB.

²² The biodiversity management plan is being prepared for the proposed wind park and an associated 220-kilovolt transmission line that passes through the Ramsar wetland area for 7.5 kilometers following the route of the old damaged 33-kilovolt line in parallel to the existing operational railway, which also crosses the wetland area. ADB. 2016. *Tranche Report: MFF 0084: Green Power Development and Energy Efficiency Improvement Investment Program (Tranche 2) (Sri Lanka)*. Manila.

²³ Tranches 1 and 2 of the recent multitranche financing facility have environmental category A. Tranche 1 has also category A for involuntary resettlement. ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to the Democratic Socialist Republic of Sri Lanka for the Green Power Development and Energy Efficiency Improvement Investment Program*. Manila.

of unanticipated environmental impacts during project implementation, CEB will take corrective action plans and update the EIA and revise the EMP, which will be disclosed on the ADB website.

31. Involuntary resettlement (category B). The project is classified as category B for involuntary resettlement.²⁴ The acquisition of approximately 90.3 hectares (ha) of private land is required for 39 wind turbines,²⁵ 2.21 kilometers of new access roads, and one new staff building. The number of the affected entities are 39 joint owners, five companies, and other unidentified owners.²⁶ CEB will purchase 12.5 ha of land from four joint private owners and two companies. The remaining 77.8 ha of land will be procured through a land acquisition process. The land to be acquired is hardly used for any productive or residential purposes and is free of encumbrances. All the landowners have other income sources, and no vulnerable households are present among the identified landowners. Neither physical displacements nor significant resettlement impacts are anticipated due to the project. The turbines and power evacuation line from the wind park to Nadukuda pooling substation will be connected through 33 kV underground cables following the right of way of the access roads. No land acquisition is expected for a new pier, but fishing activities may be temporarily affected. The project's social impacts were adequately assessed, and compensation will be paid to the affected people commensurate to the impacts. Budgetary provisions are in place to compensate affected people in a timely manner for the losses, if and when they occur. Social surveys and consultations were undertaken in accordance with ADB's Safeguard Policy Statement in 2016–2017 and will continue during project implementation. Following ADB's Safeguard Policy Statement and national regulations, the draft resettlement plan was disclosed on ADB's website on 8 June 2017. Any update of the resettlement plan resulting from a change in project scope will be disclosed. Impacts due to noise and turbine toppling distance were assessed based on a preliminary design of the wind farm, and mitigation measures have been prepared. One of the mitigation options is to adjust the locations of sensitive receptors and relocate potentially affected structures.²⁷ The numbers of affected structures and people will be known after finalization of engineering designs by the contractor, as the impacts depend on the number of turbines and their specification. The impacts will then be assessed and the resettlement plan will be updated. CEB has implemented several ADB projects and is capable of conducting resettlements in accordance with ADB's Safeguard Policy Statement. CEB will monitor the implementation of the resettlement plan and submit monitoring reports to ADB semiannually.

32. Indigenous peoples (category C). The project is not located in regions inhabited by indigenous population. Therefore, it will not have any impacts on indigenous peoples. Relevant due diligence has been conducted, and the results are incorporated in the resettlement plan.

33. Climate change impact. The project's outputs will increase the clean power generation capacity by 100 MW, which would result in 345,600 megawatt-hour energy generation per year, equivalent to avoiding about 265,700 tons of carbon dioxide emissions per year. The climate change risk screening confirms that the project has medium climate change risk.²⁸

²⁴ Resettlement Plan (accessible from the list of linked documents in Appendix 2).

²⁵ One turbine requires 150 meters by 150 meters of land, which is 2.25 ha. Among potential 39 wind turbines, two specific turbines may not be considered due to interference with navy communication links.

²⁶ Approximately 50 persons will be affected, based on the social survey and number of average household members in Sri Lanka.

²⁷ CEB initiated consultations for relocation of two cabanas with 21 ha of land acquisition and two naval quarters considering potential noise impacts, and intends to utilize a portion of CEB's allocation of project contingencies for the relocation.

²⁸ Climate Change Assessment (accessible from the list of linked documents in Appendix 2).

F. Summary of Risk Assessment and Risk Management Plan

34. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.²⁹

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigation Measures
Insufficient cash generation by Ceylon Electricity Board (CEB) to fund its operations	Progress on energy sector reforms, including (i) an independent energy sector regulatory framework, tariff structure rationalization, and internal structural reforms in CEB; (ii) improvement of CEB's financial management; and (iii) commissioning low-cost generation, including from hydropower and other renewable energy.
Potential difficulties in managing the grid due to instability resulting from integration of renewable wind generation	Wind integration requirements are addressed by the system stability studies prepared under the technical assistance provided by the Asian Development Bank (ADB) and subsequent studies by CEB; investment for renewable energy integration is included in the second tranche (2016) of the investment program financed by ADB and the project. Changes are proposed for regulatory codes and commercial arrangements.
Potential impact on migratory and congregative water birds in the wetland area	Implementation of mitigation measures proposed in the environmental impact assessment and environmental management plan; curtailment of wind turbines during the bird migratory period; and implementation of the biodiversity management plan to ensure no net loss of biodiversity.
Delays in generation and transmission investments	ADB will continue regular dialogue with CEB on required investments and provide timely financial assistance including cofinancing.
Unexpected increase in prices of commodities and raw materials	Close supervision by the steering committee and ADB, advance contracting, proactive project implementation, and inclusion of physical and price contingencies in the cost estimates.

Source: Asian Development Bank.

IV. ASSURANCES

35. The government and CEB have assured ADB that implementation of the project shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the PAM and loan documents. The government and CEB have agreed with ADB on certain covenants (including operational and corporate financial management covenants) for the project, which are set forth in the draft loan and guarantee agreements.

V. RECOMMENDATION

36. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of \$200,000,000 to Ceylon Electricity Board, to be guaranteed by the Democratic Socialist Republic of Sri Lanka, for the Wind Power Generation Project, from ADB's ordinary capital resources, in regular terms, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; for a term of 20 years, including a grace period of 5 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan and guarantee agreements presented to the Board.

Takehiko Nakao
President

26 September 2017

²⁹ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
3. Capacity of CEB in project engineering design review and supervision strengthened	<p>2b. 50 megavolt-ampere reactive reactor at Mannar grid substation (Northern Province) installed (2016 baseline: 0)</p> <p>By 2020: 3a. Engineering oversight of wind turbine installation, commissioning, and testing, and technical certification over the construction period delivered (2016 baseline: 0)</p>	3a. CEB annual report	

Key Activities with Milestones

1. Wind power generation capacity increased

- 1.1 Issue bidding documents by Q2 2017.
- 1.2 Complete land acquisition by Q1 2018.
- 1.3 Award contract by Q1 2018.
- 1.4 Start construction by Q1 2018.
- 1.5 Commission the wind power generation plant by Q4 2020.

2. System reactive power management improved

- 2.1 Issue bidding documents by Q4 2017.
- 2.2 Award contract by Q4 2018.
- 2.3 Start construction by Q1 2019.
- 2.4 Commission reactors by Q1 2021.

3. Capacity of CEB in project engineering design review and supervision strengthened

- 3.1 Issue request for expression of interest by Q3 2017.
- 3.2 Award contract by Q1 2018.
- 3.3 Complete consulting services by Q4 2020.

Project Management Activities

Twice-a-year review missions from Q1 2018 until physical completion of the project.
Prepare project completion report by Q4 2021.

Inputs

ADB ordinary capital resources (regular loan)	\$200.0 million
CEB	\$56.7 million
Total	\$256.7 million

Assumptions for Partner Financing

Not applicable

CEB = Ceylon Electricity Board, Q = quarter.

^a Government of Sri Lanka. 2015. *Sri Lanka Energy Sector Development Plan for a Knowledge Based Economy, 2015–2025*. Colombo.

Sources: Ceylon Electricity Board. 2017. *Statistical Digest 2016*. Colombo; Government of Sri Lanka. 2008. *National Energy Policy and Strategies of Sri Lanka*. Colombo; Ceylon Electricity Board and Asian Development Bank estimates.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=49345-002-3>

1. Loan Agreement
2. Guarantee Agreement
3. Sector Assessment (Summary): Energy
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Climate Change Assessment
8. Financial Analysis
9. Economic Analysis
10. Country Economic Indicators
11. Summary Poverty Reduction and Social Strategy
12. Environmental Impact Assessment
13. Resettlement Plan
14. Risk Assessment and Risk Management Plan

Supplementary Documents

15. Detailed Description of Project Components
16. Capacity Building of Ceylon Electricity Board as a Wind Park Developer for Private Sector Involvement in Wind Power Generation