ADB

Report and Recommendation of the President to the Board of Directors

Project Number: 47037
June 2014

Proposed Multitranche Financing Facility Democratic Socialist Republic of Sri Lanka: Green Power Development and Energy Efficiency Improvement Investment Program

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 29 May 2014)

Currency unit	–	Sri Lanka rupee/s (SLRe/SLRs)
SLRe1.00	=	$0.00767
$1.00	=	SLRs130.40

ABBREVIATIONS

ADB	–	Asian Development Bank
ADF	–	Asian Development Fund
AFD	–	Agence Française de Développement
CEB	–	Ceylon Electricity Board
DSM	–	demand-side management
EMP	–	environmental management plan
FBU	–	functional business unit
FIRR	–	financial internal rate of return
LIBOR	–	London interbank offered rate
MFF	–	multitranche financing facility
MOPE	–	Ministry of Power and Energy
OCR	–	ordinary capital resources
PUCSL	–	Public Utilities Commission of Sri Lanka
SDR	–	special drawing rights

WEIGHTS AND MEASURES

km	–	kilometer
kV	–	kilovolt
MW	–	megawatt

NOTE

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

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INVESTMENT PROGRAM[a] AT A GLANCE

1. Basic Data — **Project Number:** 47037-003

Project Name	Green Power Development and Energy Efficiency Improvement Investment Program	**Department /Division**	SARD/SAEN
Country	Sri Lanka	**Executing Agency**	Ministry of Power and Energy (MOPE)
Borrower	Democratic Socialist Republic of Sri Lanka		

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ **Energy**	Electricity transmission and distribution	145.32
	Energy efficiency and conservation	40.82
	Large hydropower generation	113.86
	Total	**300.00**

3. Strategic Agenda

Strategic Agenda	Subcomponents
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns Natural resources conservation

Climate Change Information

Mitigation ($ million)	154.68
CO_2 reduction (tons per annum)	170,672
Climate Change impact on the Project	Medium

4. Drivers of Change

Drivers of Change	Components
Governance and capacity development (GCD)	Institutional development
Knowledge solutions (KNS)	Pilot-testing innovation and learning
Partnerships (PAR)	Bilateral institutions (not client government) Official cofinancing

Gender Equity and Mainstreaming

No gender elements (NGE) ✓

5. Poverty Targeting

Project directly targets poverty	No

Location Impact

Nation-wide	High

6. Risk Categorization: Complex

7. Safeguard Categorization **Environment:** A **Involuntary Resettlement:** A **Indigenous Peoples:** C

8. Financing

Modality and Sources	Indicative Tranches ($million)		Amount ($ million)
	I	II	
ADB			**300.00**
Sovereign MFF-Tranche (Loan): Asian Development Fund	29.00	55.00	84.00
Sovereign MFF-Tranche (Loan): Ordinary capital resources	121.00	95.00	216.00
Cofinancing			**60.00**
Agence Francaise de Developpement	30.00	30.00	60.00
Counterpart			**80.00**
Government	40.00	40.00	80.00
Total	**220.00**	**220.00**	**440.00**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	No

10. Country Operations Business Plan

CPS	http://www.adb.org/documents/sri-lanka-country-partnership-strategy-2012-2016?ref=countries/sri-lanka/documents
COBP	http://www.adb.org/documents/sri-lanka-country-operations-business-plan-2014-2016

11. Investment Program Summary

In recent years, Sri Lanka has improved its energy sector and achieved a national electrification ratio of 94% (2012) as compared with 29% in 1990. However, a longer-term challenge is to reduce its high dependence on expensive fossil fuel energy. The energy sector struggles to (a) meet growing demand for electricity at a low cost and acceptable reliability rates, and (b) attain long term sustainability. The share of thermal oil-fired energy in the power generation mix has increased from 6% in

1995 to 59% in 2012 that creates a high energy cost base. Demand growth has been mostly met by expensive oil-fired thermal plants. This is not a viable and sustainable solution to the country's energy security and environment protection in the long term. Diversification of the generation mix primarily to renewable energy sources, improved network efficiency, reduced technical losses and supply and demand side management is the only way to correct this situation. The transmission network needs expansion and modernization, particularly in the former conflict-affected areas in Northern and Eastern provinces. The 33 kilovolt medium voltage network needs to expand power supply into rural areas where many households have poor reliability and inadequate quality of electricity supply. For sustainable functioning of the power sector, the government pursues financial, managerial, and institutional reforms in line with the Sri Lanka Electricity Act, 2009.

Impact and Outcome: The impact (of the facility) is increased access to clean and reliable power supply. The outcome (of the facility) is enhanced clean power generation, system efficiency and reliability.

Outputs: (i)Hydropower generation developed and connected to the grid in the Central Province, (ii)Transmission infrastructure enhanced, (iii)Efficiency of medium voltage network improved, (iv)Demand-side management for energy efficiency improved, and (v)Capacity development support provided to Ceylon Electricity Board.

Implementation Arrangements: Ministry of Power and Energy (MOPE) will be the executing agency/ies.

Project Readiness: Environmental and other government clearances have been obtained. Project Implementaton Units for Project 1 components were appointed. The detailed engineering design of the hydropower plant was completed under ADB's previous Sustainable Power Sector Support Project. Procurement activities have been initiated under advance contracting approved at the Management Review Meeting on 7 April 2014. Draft prequalification and bidding documents for construction of the hydropower plant have been prepared. Preparation of draft bidding documents for transmission and distribution subprojects is being finalized. Terms of Reference for consulting services have been prepared.

12. Milestones

Modality	Estimated Approval	Estimated Completion[b]
Multitranche financing facility	2014 July 15	2021 March 31
Tranche I	2014 July 30	2020 March 31
Tranche II	2016 August 25	2021 March 31

13. Linked Documents

PDS[c]	http://www.adb.org/projects/47037-003/main

[a] Multitranche Financing Facility (MFF).
[b] For MFF, this refers to the end of the availability period; for tranches, this refers to the tranche closing date.
[c] Safeguard documents can be viewed by clicking the Document's hyperlink in the Project Data Sheet (PDS) page.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a multitranche financing facility (MFF) to the Democratic Socialist Republic of Sri Lanka for the Green Power Development and Energy Efficiency Improvement Investment Program.[1]

2. The investment program includes (i) construction of a 30-megawatt (MW), run-of-river hydropower plant; (ii) transmission infrastructure enhancement for absorption of intermittent renewable energy; (iii) network efficiency improvements; (iv) demand-side management (DSM) interventions; and (v) project management and institutional capacity development in Central, Eastern, Northern, North Central, North Western, and Western provinces.[2]

II. THE INVESTMENT PROGRAM

A. Rationale

3. **Background.** Sri Lanka's efforts to develop the energy sector are reflected in the improved national electrification ratio: from 29% in 1990 to 94% by 2012.[3] However, high dependence on expensive fossil fuel energy continues. Sector challenges include meeting growing demand for electricity at a low cost and acceptable reliability, and attaining long-term sustainability. The increase of the share of thermal oil-fired energy in power generation, from 6% in 1995 to 59% in 2012, creates a high cost base. The use of expensive oil-fired thermal plants to meet the growing demand is not a viable and sustainable solution for energy security and environment protection in the long term. Diversification of the generation mix primarily to renewable energy sources, improved network efficiency, reduced technical losses, and supply- and demand-side management are needed. The transmission network needs to be expanded and modernized, particularly in former conflict-affected areas in Northern and Eastern provinces.[4] Expansion of the 33-kilovolt (kV) medium-voltage network is required to provide power to rural areas where many households have poor reliability and inadequate supply.

4. **Policy framework and road map.** Sri Lanka's national investment program is based on the 2006 10-year development framework[5] (updated in 2010).[6] The framework includes a long-term energy sector investment program, sector road map, and policy and reform measures linked to the National Energy Policy and Strategies.[7] By 2020, the objectives are to (i) increase power supply capacity to about 6,400 MW, and reduce generation cost by adding aggregate baseload capacity of about 2,000 MW from three coal-fired plants; (ii) increase the share of grid energy supply from nonconventional renewable energy sources to 20%;[8] and (iii) reduce total network losses to 10%. To reduce the current high cost of thermal power generation and attain cost recovery by 2017, the government plans to develop 2,000 MW of coal-fired capacity. It is complimentary to the development of renewable energy to achieve the energy security. As part of its cost recovery strategy, the government increased retail electricity tariffs by 35% on average in April 2013. While the government aims to increase supply capacity and replace

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1 The design and monitoring framework is in Appendix 1.
2 The Asian Development Bank (ADB) provided project preparatory technical assistance: ADB. 2013. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for Preparing the Green Power Development and Energy Efficiency Improvement Investment Program*. Manila (TA 8393-SRI).
3 Ceylon Electricity Board. 2012. *Ceylon Electricity Board's Statistical Digest Report*. Colombo.
4 The 2012 electrification rates are estimated at 80.0% for Northern Province and 79.8% for Eastern Province.
5 Ministry of Finance and Planning of Sri Lanka. 2006. *Mahinda Chintana: Vision for a New Sri Lanka*. Colombo.
6 Ministry of Finance and Planning of Sri Lanka. 2010. *Mahinda Chintana: Vision for the Future.* Colombo.
7 Ministry of Power and Energy of Sri Lanka. 2008. *National Energy Policy and Strategies of Sri Lanka*. Colombo.
8 Nonconventional renewable energy sources include mini hydropower (less than 10 MW capacity), wind, solar, and biomass.

expensive and inefficient oil-fired power plants by constructing coal-fired plants, the remaining supply capacity will come from renewable sources (and future conversion of the oil-fired plants to gas-fired plants). The 20% increase in power generation from nonconventional renewable sources will be in addition to 28% (2012) 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.

5. **Multitranche financing facility.** The MFF will finance part of the government's energy sector investment program estimated at $4.8 billion for 2014–2020. It will focus on the green power development portion and help to encourage and facilitate private sector investment in renewable power generation by improving transmission infrastructure. The MFF will support the development of hydropower generation and the proposed 200 MW wind power park in the Northern Province by financing relevant power evacuation transmission infrastructure.[9] It will also help to continue an ongoing and essential dialogue with the government on pursuing power reforms in coordination with other interested parties and development partners. The MFF is consistent with the country partnership strategy of the Asian Development Bank (ADB) for Sri Lanka.[10] It builds on previous ADB interventions focused on renewable energy development including from hydropower, wind, and solar resources.[11]

6. The government requested ADB support for developing renewable energy, particularly hydropower and wind power generation, energy and network efficiency subprojects through the MFF to expand transmission and medium-voltage infrastructure to improve efficiency, enable power evacuation from and manage integration of renewable energy in the power system. The required preconditions for the use of the MFF—a road map and strategy, a policy framework, investment and financing plans, and reliable safeguard arrangements—are in place. The MFF is the most appropriate financing modality[12] for a long-term partnership in these activities, given the phased nature of investments in electricity generation and the need for flexibility in project design and implementation. It also ensures continuity in combining investments in physical and nonphysical aspects of renewable energy and energy efficiency development.

B. Impact and Outcome

7. The impact of the investment program will be increased access to clean and reliable power supply. The outcome will be enhanced clean power generation, system efficiency, and reliability.

C. Outputs

8. The outputs will include the following:

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[9] The first two wind parks of 100 MW each are expected to be established in 2017 and 2020 in the Mannar area of Northern Province, followed by additional wind power developments.

[10] ADB. 2011. *Country Partnership Strategy: Sri Lanka, 2012–2016*. Manila.

[11] ADB financed strengthening of transmission infrastructure for hydropower evacuation from Central Province to load centers under the Clean Energy and Access Improvement Project (2009) and Sustainable Power Sector Support Project (2011). ADB's Clean Energy and Network Efficiency Improvement Project (2012) funds transmission infrastructure in Northern Province to be used for evacuation of wind power from the proposed site in Mannar district and the solar rooftop power generation pilot. ADB supported actual wind measurements and resource assessment at the proposed 200 MW wind park site in Mannar with ADB. 2011. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for Clean Energy and Network Efficiency Improvement*. Manila. A system stability study, a master plan, and a business model of the proposed wind park are being finalized with support of ADB. 2012. *Technical Assistance to the Democratic Socialist Republic of Sri Lanka for Capacity Building for Clean Power Development*. Manila.

[12] Comparison of Financing Modality (accessible from the list of linked documents in Appendix 2).

(i) **Hydropower generation developed**. In Central Province, a 30-MW, run-of-river hydropower plant will be built at Moragolla,[13] including 0.5 km of 132 kV associated transmission infrastructure to connect the plant to the grid, which will increase clean, low cost, baseload power generation.

(ii) **Transmission infrastructure enhanced.** In Eastern, Northern, North Central, North Western, and Western provinces, 220/132 kV, 220/132/33 kV, and 132/33 kV grid substations and associated lines will be constructed to absorb the increased power demand and ensure stable system operation with intermittent wind and solar generation.

(iii) **Efficiency of medium-voltage network improved.** In Eastern and North Western provinces, 33-kV lines and reactive power management will be developed by installing switched capacitor banks in the medium-voltage network to address overloading of conductors, voltage drop in medium-voltage lines, and poor power factor.

(iv) **Demand-side management for energy efficiency improved.** Pilot DSM subprojects in Colombo will (a) use smart grid and metering technologies, (b) retrofit buildings with smart energy-saving technology, and (c) install cold thermal storage in selected buildings to achieve energy savings.

(v) **Capacity development support provided to Ceylon Electricity Board (CEB).** Capacity development will reinforce the physical investments and include (a) institutional capacity building for power system development, system operation and dispatching, and energy efficiency improvement; and (b) project management, including implementation supervision and preparation of new projects for the second tranche.

9. In 2014, project 1 will include the construction of (i) the 30-MW, run-of-river hydropower plant at Moragolla and associated transmission infrastructure; (ii) four new grid substations and associated lines at Kerewalapitiya (220/33 kV), Kappalturai (220/132/33 kV), Kalutara and Kesbewa (both 132/33 kV), and augmentation of Katunayake and old Anuradhapura 132/33 kV grid substations in Western, Eastern, and North Central provinces; (iii) 33 kV lines and gantries around Vavunativu and Madampe in Eastern and North Western provinces; and (iv) DSM pilot subprojects in Colombo. Nonphysical outputs include capacity building and project management for preparing future MFF investments and supervising implementation of capital investments of project 1.[14] In 2016, project 2 will include enhancement of transmission infrastructure, including power evacuation from the wind park; medium-voltage network efficiency improvement; and DSM subprojects.

D. Investment and Financing Plans

10. The investment program is estimated to cost $440 million (Table 1).

11. The government requested an MFF in an amount up to $360 million to finance the investment program. The financing includes a $216 million loan from ADB's ordinary capital resources (OCR), an $84 million loan from ADB's Special Funds resources (ADF),[15] and a

[13] The detailed engineering design was completed under ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Administration of Technical Assistance Grant to the Democratic Socialist Republic of Sri Lanka for the Sustainable Power Sector Support Project*. Manila.

[14] Detailed Description of Project Components (accessible from the list of linked documents in Appendix 2).

[15] Any ADF allocation will be subject to (i) the general availability of ADF resources from time to time; (ii) Sri Lanka's access to such resources pursuant to ADB's graduation policy, as amended from time to time, and the requirements of the ADF donors; and (iii) the availability of such resources to Sri Lanka pursuant to ADB's policy on performance-based allocation of ADF resources, as amended from time to time.

$60 million loan from Agence Française de Développement (AFD) to be administered by ADB (Table 2).[16] The MFF will have two tranches, subject to the submission of periodic financing requests; execution of loan and project agreements for each tranche; and fulfillment of terms, conditions, and undertakings set forth in the framework financing agreement.[17]

Table 1: Investment Program
($ million)

Item	Amount[a]
A. Base Cost[b]	
1. Construction of Moragolla hydropower plant	113.18
2. Transmission infrastructure development and medium-voltage network efficiency improvement	242.58
3. Energy efficiency pilot subprojects	14.04
4. Project management and capacity building[c]	12.31
Subtotal (A)	**382.11**
B. Contingencies[d]	**44.22**
C. Financing Charges During Implementation[e]	**13.67**
Total (A+B+C)	**440.00**

[a] Includes taxes and duties of $18.57 million and incremental (e.g., land, environmental, and social mitigation) costs of $3.54 million to be financed from government resources.
[b] In first quarter 2014 prices.
[c] Includes overhead costs associated with project management, implementation, and monitoring.
[d] Physical contingencies computed at 5% of base cost. Price contingencies computed using ADB forecasts of international and domestic inflation.
[e] Financial charges during implementation include interest from all financing sources. For ADB financing, financial charges during implementation are computed at the 5-year swap rate for the London interbank offered rate plus an effective contractual spread of 50 basis points for ordinary capital resources (OCR) loan components and at a base rate of 2.0% for Asian Development Fund loan components. Commitment charges for an OCR loan are computed at 0.15% per year to be charged on the undisbursed loan amount.
Sources: Ceylon Electricity Board and Asian Development Bank estimates.

Table 2: Financing Plan
($ million)

Source	Project 1	Project 2	Projects 1 and 2	Share of Total (%)
Asian Development Bank				
Ordinary capital resources loan	121.00	95.00	216.00	49.09
Special Funds resources loan	29.00	55.00	84.00	19.09
Subtotal	**150.00**	**150.00**	**300.00**	**68.18**
Cofinancing				
Agence Française de Développement loan[a]	30.00	30.00	60.00	13.64
Government	40.00	40.00	80.00	18.18
Total	**220.00**	**220.00**	**440.00**	**100.00**

[a] Agence Française de Développement (AFD) confirmed that it will cofinance project 1 and expressed interest in cofinancing project 2 subject to AFD management's decision at the later stage.
Source: Asian Development Bank estimates.

12. For the first MFF tranche of $180 million, the government has requested a loan of $121 million from ADB's ordinary capital resources; a loan in various currencies equivalent to SDR 18.768 million from ADB's Special Funds resources;[18] and a loan of $30 million from AFD

[16] The government will provide proceeds of the ADB loans to CEB on terms and conditions satisfactory to ADB.
[17] Framework Financing Agreement (accessible from the list of linked documents in Appendix 2).
[18] The requested loan is equivalent to $29 million (as of 19 May 2014, the date of the loan negotiations).

to be administered by ADB. [19] The OCR loan will have a 20-year term, including a grace period of 5 years, a straight-line repayment method, 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, and such other terms and conditions set forth in the draft OCR loan and project agreements.[20] The Special Funds resources loan will have a 25-year term, including a grace period of 5 years, an interest rate of 2.0% per annum during the grace period and thereafter, and such other terms and conditions set forth in the draft ADF loan and project agreements.

13. Since the MFF involves both ADB-administered cofinancing resources and ADF resources, universal procurement will apply. [21] The AFD loan will finance a separate procurement package for grid substations. The OCR loan will finance the construction of the Moragolla hydropower plant and a portion of transmission infrastructure, while the ADF resources loan will finance medium-voltage network efficiency improvement, DSM pilots, consulting services, and a portion of transmission infrastructure. Accordingly, since the OCR will be blended with ADF resources at the project level, a waiver of the member country procurement eligibility restrictions applicable to ordinary capital resources is sought from the ADB Board of Directors. The government and CEB will finance the interest during implementation, taxes and duties, contingencies, and incremental costs (e.g., land acquisition, and environmental and social mitigation). Financing charges during implementation of about $13.67 million include interest during construction to be paid by the government to ADB and AFD for the provided loans.

E. Implementation Arrangements

14. The Ministry of Power and Energy (MOPE) will be the executing agency; CEB will be the implementing agency. A steering committee, chaired by the MOPE secretary, will guide CEB and review progress and results. CEB will set up project implementation units. The units 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 MOPE, depending on the contract size. Full-time managers will supervise each project component under the MFF.

15. The government has asked ADB to approve advance contracting for procurement of goods and civil works, including preparing bidding documents, and inviting and receiving bids for project contracts, and retroactive financing under the MFF. Retroactive financing will be allowed for up to 20% of the individual loan amount for expenditures incurred 12 months prior to loan signing. The government was advised that ADB's approval of advance contracting and retroactive financing in principle does not commit ADB to finance any part of the MFF. The implementation arrangements are summarized in Table 3 and described in detail in the facility administration manual.[22]

[19] AFD will provide contractual parallel cofinancing where ADB may cover procurement and disbursement supervision through partial administration of cofinancing.
[20] As the OCR loan has an average loan maturity of 12.75 years, no maturity premium is payable to ADB.
[21] ADB. 2013. *Blanket Waiver of Member Country Procurement Eligibility Restrictions in Cases of Cofinancing for Operations Financed from Asian Development Fund Resources*. Manila.
[22] Facility Administration Manual (accessible from the list of linked documents in Appendix 2).

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	1 October 2014–30 September 2020 (for the MFF) 1 October 2014–30 September 2019 (for project 1)		
Estimated project completion date	30 September 2020 (for the MFF), 30 September 2019 (for project 1)		
(i) Executing agency	Ministry of Power and Energy		
(ii) Key implementing agencies	Ceylon Electricity Board		
(iii) Project implementation units	Established in Ceylon Electricity Board		
Procurement (project 1)	International competitive bidding	4 procurement packages	$167.69 million
Consulting services (project 1)	QCBS	3 consulting contracts	$12.31 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 individual loan amount for expenditures incurred 12 months prior to loan signing.		
Disbursement	The proceeds of the loans will be disbursed in accordance with the Asian Development Bank's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed upon by the government and the Asian Development Bank.		

MFF = multitranche financing facility, QCBS = quality- and cost-based selection.
Source: Asian Development Bank estimates.

III. DUE DILIGENCE

A. Technical

16. CEB prepared technical studies on power system stability, renewable energy master plans, and transmission enhancement requirements with ADB technical assistance (footnote 11). The detailed engineering design of the hydropower plant was prepared under the ADB's previous loan (footnote 13). The due diligence focused on technology, nature and characteristics of investment plans, seasonality of hydropower capacity, and the most appropriate electricity evacuation arrangements and renewable energy integration proposals. ADB assessed the technical studies as acceptable. Sequencing of the generation developments and transmission system enhancement under the investment program is technically feasible and execution arrangements are satisfactory. A road map for renewable energy integration will be refined under project 1 and implemented under the investment program.

B. Economic and Financial

17. An economic internal rate of return of 15.17% was calculated for project 1 by comparing with- and without-project scenarios.[23] Detailed cost–benefit calculations confirm the economic viability and sustainability of the investments. A sensitivity and risk analysis demonstrates a robust economic performance.

18. The financial internal rate of return (FIRR) is 4.34% for project 1.[24] Financial viability was examined by comparing the incremental costs and benefits on a with- and without-investment basis. The financial analysis was carried out in real terms. The weighted average cost of capital was calculated for each subproject and resulted in 1.06% for the overall project. Financial viability was assessed by comparing the weighted average cost of capital to the FIRR for each

[23] Economic Analysis: Project 1 (accessible from the list of linked documents in Appendix 2).
[24] Financial Analysis: Project 1 (accessible from the list of linked documents in Appendix 2).

subproject and for the aggregated project. The sensitivity analysis demonstrates that the project will remain financially viable even under adverse scenarios.

C. Governance

19. 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 began regulating each FBU separately and issued 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 between FBUs is not functioning properly. PUCSL established a tariff methodology and a road map for tariff reforms and rebalancing. Three tariff filings were conducted and tariff determinations announced in 2011–2013.

20. CEB has the necessary capacity to undertake the investment program. 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 investment program. 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 2009 act, all tariffs must reflect costs; and Treasury will bear the cost of any government-approved subsidy. In March 2008, the government introduced a new tariff structure that increased average retail tariffs by 30%. The government has also restructured a portion of CEB's long-term debt. 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. With the introduction of low-cost generation, cost recovery is anticipated from 2017. Details of CEB's financial management assessment are available in the facility administration manual and in the assessment of CEB's financial performance and projections.[25]

21. All procurement will be carried out in accordance with ADB's Procurement Guidelines (2013, 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 include (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 facility administration manual (footnote 22).

D. Poverty and Social

22. The MFF and project 1 will contribute to sustainable economic development, poverty reduction, and social well-being by increasing access to electricity, reducing system losses, and improving the quality of electricity.[26] Greater access to a stable supply of electricity will promote business expansion and increase jobs, which will help reduce poverty. The MFF's projects are

[25] Summary of CEB's historical financial performance and projections available in the financial analysis (footnote 24).
[26] Summary Poverty Reduction and Social Strategy (accessible from the list of linked documents in Appendix 2).

expected to generate jobs for skilled and unskilled laborers during construction. Expansion of the 33 kV network will improve access to electricity and quality of supply for about 300,000 customers in rural areas and small towns. This will enhance the living standards of rural households and benefit rural poor women as they are especially affected by the lack or unreliable supply of electricity.

E. Safeguards

23. The environment assessment and review framework, resettlement framework, and indigenous peoples planning framework outline the environment and social safeguard principles and requirements.[27] CEB will undertake environmental and social safeguard due diligence for individual investments based on the three frameworks; and submit quarterly reports on the implementation of environmental management plans (EMPs), resettlement plans for projects, and, if required, indigenous peoples plans.

24. **Environment.** Project 1 investments are classified category A for environment as they include construction of the Moragolla hydropower plant.[28] Other major components include construction of transmission grid substations and associated transmission lines where construction work is limited to building foundations for transmission towers and substations. Based on CEB's environmental assessments and surveys, the hydropower plant may have considerable adverse environmental impacts; but the transmission and medium-voltage network will have minimal impact. The environmental impact assessment for the hydropower plant assesses environmental impacts related to the construction, inundation of properties and forest habitat, and others, including potential effects on the habitat of the Green Labeo fish in Mahaweli River. CEB conducted several studies to comply with critical habitat tests and "no net loss" of biodiversity requirement as per ADB's Safeguard Policy Statement (2009). Continuing consultations are ongoing with wildlife stakeholder organizations, assessing reservoir safety, and developing an appropriate mechanism to guarantee downstream flows between CEB and the Mahaweli Authority to maintain the endangered Green Labeo fish in the tailrace of the Moragolla dam. For the hydropower plant and transmission infrastructure, anticipated environmental impacts can be mitigated by implementing the relevant EMPs. Budgetary provisions are in place to cover the environmental mitigation and monitoring requirements including mitigation measures and institutional capacity development to manage environmental risks during design, construction, and operation. CEB has adequate institutional capacity, commitment, and experience to manage environmental risks during construction and operation of the hydropower plant. EMP mitigation measures and additional requirements for critical habitat management will be incorporated into civil works contracts giving contractors the primary responsibility for implementation during construction. CEB will supervise construction and EMP implementation. The contractors and CEB will adhere to ADB's Safeguard Policy Statement (2009) and national environmental regulations. In compliance with ADB public disclosure requirements, the environmental impact assessment and relevant EMPs for project 1 were disclosed on 24 February 2014. Project 2 is expected to be classified category A for environment due to the inclusion of transmission infrastructure for power evacuation from the proposed wind parks.[29]

25. **Involuntary resettlement.** Project 1 is classified as category A for involuntary resettlement. The Moragolla hydropower plant component will have considerable impact on land

[27] Environmental Assessment and Review Framework, Resettlement Framework, and Indigenous Peoples Planning Framework (accessible from the list of linked documents in Appendix 2).
[28] Environmental Impact Assessment: Project 1 and Initial Environmental Examinations (accessible from the list of linked documents in Appendix 2).
[29] Proposed Wind Parks in Mannar Area (accessible from the list of linked documents in Appendix 2).

acquisition and involuntary resettlement, including physical and economic displacement.[30] Plant construction will require 38.24 hectares of private land and will impact 86 households (308 people). The acquisition of 2.92 hectares of private land for construction of transmission grid substations and medium-voltage gantries will not result in any physical displacement. Where new grid substations are built on commercial and private land, compensation will be paid to the owners at replacement cost. The transmission and distribution lines primarily cross public and unused lands. Construction will be carried out during non-cropping seasons. Where cropland is affected, compensation at replacement cost will be paid. Budgetary provisions are in place to compensate affected people for these losses if and when they occur. Special attention will be paid to addressing gender equity issues in the resettlement framework. Additional assistance will be given to vulnerable households including those headed by women. Social surveys and consultations were undertaken in accordance with ADB's Safeguard Policy Statement (2009). The loan agreements will include a standard assurance related to core labor standards for contractors, including equal pay for equal types of work, and an awareness program on HIV/AIDS and sexually transmitted diseases. Project 1 is classified category C for indigenous peoples, as no indigenous peoples will be affected.

26. **Climate change impact.** Project 1's renewable energy intervention will bring an additional 97.7 gigawatt-hours of hydropower generation to the grid per year, equivalent to avoiding about 72,272 tons of carbon dioxide emissions per year for the useful life of the plant. An average annual reduction of about 98,400 tons of carbon dioxide emissions may be achieved through technical loss reduction from the improved energy efficiency of the transmission and distribution infrastructure. The climate change risk screening confirms that MFF components have low climate change risks.[31]

F. Risks and Mitigating Measures

27. Governance risk stems from CEB having insufficient cash to fund its operations (para. 20). Risks to project implementation include potential technical problems integrating renewable (primarily wind) energy with the grid and cost escalation. Environmental risk includes reduced water flow in Mahaweli River during the dry season. These risks appear to be moderate and may be mitigated by (i) ensuring progress on power reforms, and government efforts to increase supply capacity and reduce generation costs; (ii) addressing wind integration requirements under the renewable energy master plan and system stability studies; (iii) closely supervising implementation and advance contracting; and (iv) developing appropriate mechanisms to guarantee downstream flows during the dry season between CEB and the Mahaweli Authority to maintain the endangered Green Labeo fish in the tailrace. Major risks and mitigating measures are described in the risk assessment and risk management plan (Table 4).[32]

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Insufficient cash generation by CEB to fund its operations	Progress on energy sector reforms, including an independent energy sector regulatory framework, rationalizing tariff structures, and internal structural reforms in CEB; and commissioning low-cost generation, including from hydropower and other renewable energy sources
Potential difficulties managing the grid due to instability as a result	Addressing wind integration requirements under the renewable energy master plan and system stability studies prepared under ADB technical assistance, investment for renewable energy integration proposed under the

[30] Resettlement Plan (accessible from the list of linked documents in Appendix 2).
[31] Climate Change Risk Assessment: Moragalla Hydropower Plant (accessible from the list of linked documents in Appendix 2).
[32] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigating Measures
of integrating renewable wind generation	MFF tranches, and changes proposed in regulatory codes and commercial arrangements
Cost escalation	Close supervision by the steering committee and ADB, open and transparent competitive bidding, proactive project implementation, advance contracting, inclusion of physical and price contingencies in the cost estimates
Reduced water flow during the dry season in Mahaweli River	Development of an appropriate mechanism to guarantee downstream flows between CEB and the Mahaweli Authority to maintain the endangered Green Labeo fish in the tailrace

ADB = Asian Development Bank, CEB = Ceylon Electricity Board, MFF = multitranche financing facility.
Source: Asian Development Bank estimates.

IV. ASSURANCES

28. The government and CEB have assured ADB that implementation of the investment program 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 facility administration manual and loan documents. The government and CEB have given ADB certain undertakings for the MFF, which are set forth in the framework financing agreement. Specific covenants agreed by the government and CEB with respect to MFF individual tranches are set forth in the loan and project agreements for the respective tranches.

V. RECOMMENDATION

29. I am satisfied that the proposed multitranche financing facility would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

(a) the multitranche financing facility to the Democratic Socialist Republic of Sri Lanka for the Green Power Development and Energy Efficiency Improvement Investment Program in an aggregate principal amount not exceeding the equivalent of $360,000,000 which comprises:

(i) the provision of loans from ADB's Special Funds resources, with interest and other terms to be determined in accordance with ADB's applicable policies relating to Special Funds resources;
(ii) the provision of loans from ADB's ordinary capital resources, with interest and other terms to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility; and
(iii) the administration of cofinancing to be provided by Agence Française de Développement and any other development partner

and is subject to such other terms and conditions as are substantially in accordance with those set forth in the framework financing agreement presented to the Board; and

(b) the proposal in paragraph 13 of this report to permit procurement in non-member countries of ADB of goods, works, and services produced in non-member countries of ADB.

Takehiko Nakao
President

24 June 2014

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Increased access to clean and reliable power supply	System supply capacity increased to 6,367 MW by 2020 (baseline 2012: 3,312 MW) Electrification rate increased to 100% access to all by 2016 (baseline 2012: 94%) In-grid energy supply from nonconventional renewable energy sources increased to 10.0% by 2016 and 20.0% by 2020 (baseline 2012: 6.4%)	(For all indicators) CEB annual report (power statistics) Progress reports on 10-year development framework	**Assumptions** The government remains committed to power reforms and development of renewable energy sources. A conducive regulatory environment is adopted for private sector involvement in developing renewable energy. **Risks** Increase in fuel oil costs, reliance on expensive thermal electricity generation, and tariffs set below supply cost will impact CEB operation and financial capacity. Unfavorable changes in global financial and economic environment may adversely affect the domestic economy.
Outcome Enhanced clean power generation, system efficiency, and reliability	Total losses of the CEB network reduced to 10.00% of net generation by 2020 (baseline 2012: 10.67%) Transmission infrastructure for connecting 200 MW of wind power to the grid completed by December 2018 97.7 GWh clean hydropower generation per year, resulting in annual avoided emissions of 72,272 tons of carbon dioxide, added to the system by June 2019 Distribution line-end voltage fluctuation maintained within 5% in project areas by December 2018 (baseline 2013: 10%)	(For all indicators) CEB annual report (power statistics) Progress reports on 10-year development framework CEB monthly system reports	**Assumptions** Least-cost generation expansion plan, including generation from renewable sources, implemented as scheduled. The government continues to fund extension and strengthening of the grid. **Risk** Integration of intermittent wind generation may create potential difficulties in managing the grid.
Outputs 1. Hydropower generation developed	30 MW of run-of-river hydropower plant constructed in Central Province by June 2019 0.5 km of dedicated 132 kV transmission line constructed to connect the	CEB annual report (power statistics) Government budget Government gazette	**Assumption** Implementation capacity of CEB remains sufficient to handle multiple projects. **Risks** Unexpected increase in prices of commodities and raw materials, and construction

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	hydropower plant to the grid by June 2019		delays impact the work. Water flow in Mahaweli River reduces during the dry season.
2. Transmission infrastructure enhanced	210 MVA 220/132 kV and 816.5 MVA 132/33 kV grid substation capacity added by June 2020 12.3 km upgraded, and 175 km of new 132 kV and 151 km of new 220 kV transmission lines added by June 2020 2x63 MVA, 220/132/33 kV grid substation capacity and 30 km 220 kV transmission line constructed by December 2018 to enable connection of future wind generation in Northern Province	CEB annual report (power statistics) Project progress reports by CEB CEB monthly reporting	
3. Efficiency of medium-voltage network improved	235.4 km of new 33 kV lines added to improve power supply quality to about 300,000 customers by June 2020 75 MVAR installed in 33 kV network for reactive power management by June 2020	Project progress reports by CEB CEB annual report (power statistics) CEB monthly reporting	
4. Demand-side management for energy efficiency improved	Energy savings of 1,700 MWh/year from pilot subproject implementation by June 2019 DSM regulations approved and announced by 1 January 2016	Project progress reports by CEB CEB annual report (power statistics) CEB monthly reporting	
5. Capacity development support provided to CEB	Support for review of transmission design specifications and standards, and application of new technologies provided by 2016 New subprojects prepared for the second tranche by June 2016 Project monitoring and supervision guidelines approved and in place by December 2015	PUCSL and CEB reports Project progress reports by CEB	

Activities with Milestones	Inputs
1. Hydropower generation developed	
1.1. Land acquisition completed by January 2015	**Loans in two tranches**
1.2. Construction of Moragolla 30 MW run-of-river hydropower plant by June 2019	**ADB: $300 million** Ordinary capital resources: $216 million Special Funds resources: $84 million
1.3. Construction of 132 kV transmission line to connect Moragolla hydropower plant to the grid by June 2019	**Government: $80.00 million**
2. Transmission infrastructure enhanced	
2.1. Land acquisition completed by January 2015	**Cofinancing (AFD): $60.00 million**
2.2. Construction and augmentation of 220/132 kV, 220/132/33 kV, and 132/33 kV grid substations in critical locations and associated transmission lines by June 2019	
2.3. Construction of 2x63 MVA, 220/132/33 kV grid substation and 30 km 220 kV transmission line in Mannar district of Northern Province by December 2018	
3. Efficiency of medium-voltage network improved	
3.1. Land acquisition completed by January 2015	
3.2. Construction of new 33 kV lines and gantries by June 2020	
3.3. Installation of reactive power devices by June 2020	
4. Demand-side management for energy efficiency improved	
4.1. DSM regulations approved and announced by 1 January 2016	
4.2. DSM pilot projects undertaken by June 2019	
5. Capacity development support provided to CEB	
5.1. Project supervision capabilities enhanced by December 2015	
5.2. Design of new subprojects finalized for the second tranche by June 2016	

ADB = Asian Development Bank, AFD = Agence Française de Développement, CEB = Ceylon Electricity Board, DSM = demand-side management, GWh = gigawatt-hour, km = kilometer, kV = kilovolt, MVA = megavolt-ampere, MVAR = megavolt-ampere reactive, MW = megawatt, MWh = megawatt-hour, OCR = ordinary capital resources, PUCSL = Public Utilities Commission of Sri Lanka.

Sources: Ceylon Electricity Board. 2012. *CEB Statistical Digest Report*. Colombo; Ministry of Finance and Planning of Sri Lanka. 2010. *Mahinda Chintana: Vision for the Future.* Colombo; Ceylon Electricity Board estimates; and Asian Development Bank estimates.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=47037-003-3

1. Loan Agreement: Special Funds Resources
2. Loan Agreement: Ordinary Capital Resources
3. Project Agreement
4. Framework Financing Agreement
5. Periodic Financing Request for Project 1
6. Sector Assessment (Summary): Energy
7. Facility Administration Manual
8. Contribution to the ADB Results Framework
9. Development Coordination
10. Financial Analysis: Project 1
11. Economic Analysis: Project 1
12. Country Economic Indicators
13. Summary Poverty Reduction and Social Strategy
14. Environmental Assessment and Review Framework
15. Environmental Impact Assessment: Project 1 Moragolla Hydropower Plant—Local Environmental Impact Assessment
16. Environmental Impact Assessment: Project 1 Moragolla Hydropower Plant—Additional Environmental Studies
17. Environmental Impact Assessment: Project 1 Moragolla Hydropower Plant—Environmental Main Report
18. Environmental Impact Assessment: Project 1 Moragolla Hydropower Plant—Environmental Management Plan
19. Initial Environmental Examination: Project 1 Transmission Development
20. Initial Environmental Examination: Project 1 Distribution System Improvement
21. Resettlement Plan: Project 1 (Transmission and Distribution)
22. Resettlement Plan: Project 1 (Moragolla Hydropower Plant)
23. Resettlement Framework
24. Indigenous Peoples Planning Framework
25. Risk Assessment and Risk Management Plan

Supplementary Documents

26. Comparison of Financing Modality
27. Detailed Description of Project Components
28. Proposed Wind Parks in Mannar Area
29. Climate Change Risk Assessment: Moragolla Hydropower Plant