Technical Assistance Report

Project Number: 55079-002
Transaction Technical Assistance Facility (F-TRTA)
October 2021

Democratic Socialist Republic of Sri Lanka: Promoting Increased Renewable Energy Deployment, Energy Efficiency, and Power System Resilience

Asian Development Bank

CURRENCY EQUIVALENTS
(As of 30 September 2021)

Currency unit	=	Sri Lanka rupee/s (SLRe/SLRs)
SLRe1.00	=	$0.0050002
$1.00	=	SLRs199.99

ABBREVIATIONS

ADB	–	Asian Development Bank
CEB	–	Ceylon Electricity Board
LECO	–	Lanka Electricity Company (Pvt) Ltd.
MW	–	megawatt
SLSEA	–	Sri Lanka Sustainable Energy Authority
TA	–	technical assistance

NOTE

(i) In this report, "$" refers to United States dollars.

Vice-President	Shixin Chen, Operations 1
Director General	Kenichi Yokoyama, South Asia Department (SARD)
Director	Kaoru Ogino, Officer-in-Charge, Energy Division (SAEN), SARD
Team leader	Jaimes Kolantharaj, Senior Energy Specialist, SAEN, SARD
Team members	Angela Francesca Bernaldo, Project Officer, SAEN, SARD
	Prathaj Haputhanthri, Associate Project Officer (Energy), Sri Lanka Resident Mission, SARD
	Yoojung Jang, Social Development Specialist, SAEN, SARD
	Sajid Raza Zaffar Khan, Financial Management Specialist, Portfolio, Results and Quality Control Unit, SARD
	Rosanna Mae Labitag, Operations Assistant, SAEN, SARD
	Jongmi Son, Finance Specialist (Energy), SAEN, SARD

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TRANSACTION TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 55079-002

Project Name	Promoting Increased Renewable Energy Deployment, Energy Efficiency, and Power System Resilience	**Department/Division**	SARD/SAEN
Nature of Activity	Project Preparation	**Executing Agency**	Ministry of Power and Renewable Energy
Modality	Facility		
Country	Sri Lanka		

2. Sector

	Sector	Subsector(s)	ADB Financing ($ million)
✓	Energy	Electricity transmission and distribution	0.60
		Renewable energy generation - solar	0.40
		Total	**1.00**

3. Operational Priorities

- ✓ Accelerating progress in gender equality
- ✓ Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability
- ✓ Strengthening governance and institutional capacity

Climate Change Information[1]

GHG Reductions (tons per annum)	0.000
Climate Change impact on the Project	Low
ADB Financing	
Adaptation ($ million)	0.20
Mitigation ($ million)	0.40
Cofinancing	
Adaptation ($ million)	0.00
Mitigation ($ million)	0.00

Sustainable Development Goals

SDG 7.1
SDG 9.1
SDG 13.a

Gender Equity and Mainstreaming

Some gender elements (SGE) ✓

Poverty Targeting

General Intervention on Poverty ✓

4. Risk Categorization Low

5. Safeguard Categorization Safeguard Policy Statement does not apply

6. Financing

Modality and Sources	Amount ($ million)
ADB	**1.00**
Transaction technical assistance: Technical Assistance Special Fund	1.00
Cofinancing	**0.00**
None	0.00
Counterpart	**0.10**
Government	0.10
Total	**1.10**

Currency of ADB Financing: US Dollar

[1] The project reduces greenhouse gas emissions. However, it does not fall under the eligibility criteria for climate mitigation finance as defined by the joint multilateral development bank methodology on tracking climate finance, which notes that not all activities that reduce greenhouse gases in the short term are eligible to be counted towards climate mitigation finance. Accordingly, greenfield fossil fuel projects are excluded, and climate mitigation finance is considered zero.

I. THE TECHNICAL ASSISTANCE FACILITY

A. Justification

1. **The proposal.** The transaction technical assistance (TA) facility will support the (i) deployment of renewable energy, (ii) regulatory interventions to improve energy efficiency and renewable energy penetration, (iii) identification of climate resilient investments, and (iv) increase in project readiness of pipeline projects and support its implementation. The TA will also provide support innovation in project design, project sustainability and transfer capacity through specific training and skills-building activities for ensuing projects and implementation support for ongoing projects as required. Initially, the TA facility will support:

(i) Climate Resilient and Sustainable Energy Transition Project;[1]
(ii) Additional financing for Rooftop Solar Generation Project;[2] and
(iii) Power System Reliability Strengthening Project.[3]

2. **Sector overview.** Sri Lanka's energy sector performance has achieved a national electrification ratio of 99.6% (2018), up from 29% in 1990. However, the sector continues to struggle in meeting the growing demand due to high electricity generation cost emanating from increasing share of oil-fired thermal power in generation mix and inadequate level of power system reliability. The increasing share of oil-fired thermal generation poses a serious threat to the country's energy security and the environment. There is an urgent need to develop other clean energy sources in addition to hydropower, undertake loss reduction efforts, and improve the power system reliability.

3. Ceylon Electricity Board (CEB), the single electricity buyer and transmission licensee has been in financial stress due to (i) increasing share of oil-fired thermal generation, (ii) delay in planned low-cost generation plants, (ii) below cost recovery tariffs, and (iv) absence of formal mechanism for the government to provide revenue subsidies for keeping tariff below the approved cost of supply. Hence, CEB has been dependent on short term borrowings to bridge the revenue shortfall resulting in poor financial position and increasing debt levels. The electricity revenue gap needs to be filled through either a subsidy from the government or tariff increase, or a combination of both. However, the economic impacts that followed from the Easter bomb-blasts in 2019 and the coronavirus disease (COVID-19) pandemic have created additional challenges, making it difficult to increase the tariffs to cost recovery levels in the near term due to affordability issues on vulnerable consumers and sectors. From January to July 2020, CEB's total electricity sales declined by 3.5% on a year-on-year basis compared with the corresponding period of 2019 due to reduction in sales from all user categories, except households and government sector. There has also been reduction in bill collections compared to 2019 from the affected businesses such

[1] This ensuing project will support renewable energy deployment and develop climate resilient transmission and distribution investments to improve power system reliability. This ensuing project is named as Power System Reliability Strengthening Project – Phase 2 in Sri Lanka country operations business plan, 2021–2023 (ADB. 2020. *Country Operations Business Plan: Sri Lanka, 2021–2023.* Manila).

[2] The Asian Development Bank (ADB) approved the Solar Rooftop Generation Project in 2017 (ADB. *Sri Lanka: Rooftop Solar Power Generation Project)*, aiming to support the government's Battle for Solar Energy Program. The project is in advanced stages of implementation, expecting installation of 60 megawatts (MW) solar rooftop systems by 2021. The additional financing will scale up the ongoing project and expand the rooftop solar development in Sri Lanka.

[3] The fact-finding mission for this proposed project was conducted in November 2020. Project preparation is in the advanced stages and approval is expected in 2021. The TA will support the implementation of gender sensitive workplace practices under this project after its approval. This project is included as a firm project in Sri Lanka country operations business plan 2021–2023.

as tourism which has affected CEB's over 99% collection ratio. The crisis further emphasizes the need to improve the sector's financial viability by reducing electricity generation costs by timely implementation of low-cost generation plants, further improvement in operational efficiencies, regulatory reforms aimed at market-based incentives for renewable energy deployment and development of a financial recovery plan to improve financial sustainability of CEB and the power sector.

4. **Government's vision.** The government has recently set an ambitious target of achieving 70% share of power generation through renewable energy by 2030.[4] The National Energy Policy and Strategies of Sri Lanka 2019[5] envisages the energy sector to ensure energy security through supplies that are cleaner, secure, economical, and reliable to provide convenient, and affordable energy services to support socially equitable development of the country. The energy policy and the nationally determined contributions (NDC) identify investing in renewable energy, switching towards cleaner energy sources, enhancing climate resilience, and improving energy efficiency as vital steps to improve the national energy security. The energy sector has a 25% greenhouse gas emission reduction target in the NDCs (5% unconditionally and 20% conditionally) by 2030 and this is expected to be achieved through investments in renewable energy,[6] introducing demand-side management activities, strengthening sustainable energy-related policies, and adopting liquefied natural gas to replace fuel oil-based electricity generation.

5. The energy sector assessment, strategy, and roadmap of Sri Lanka prepared by the Asian Development Bank (ADB)[7] identify (i) facilitating development and deployment of renewable energy; (ii) strengthening and modernizing transmission and distribution assets to improve reliability, resilience and enhance renewable penetration; (iii) improving energy efficiency and demand management; (iv) capacity building to leapfrog technological advancements in energy sector; and (v) promoting institutional reform as the key areas to be focused on in future energy sector operations. The main areas considered in future interventions include scaling up of renewable energy deployment through mobilizing private investments in transparent and competitive manner, improving the financial sustainability of power sector, supporting energy storage and climate resilient grid enhancement, and capacity building support and pilot testing of future potential technologies (i.e., off sore wind, floating solar, green hydrogen) applicable to Sri Lanka. The replacement of liquid fuel-based generation with renewables and cleaner sources, presents an important opportunity for the country to reduce generation cost, meet growing energy demand and diversify the power generation mix.

6. **ADB's experience**. ADB has been one of the country's largest multilateral financing partners in the power sector supporting across all the subsectors–generation, transmission, and distribution. ADB also has broad experience in Sri Lanka's renewable energy subsector through various ongoing projects such as (i) 30.5 megawatts (MW) Moragolla hydropower plant and its associated infrastructure, (ii) systematic development of 100 MW Mannar wind power generation project including its power evacuation facilities, (iii) a credit line facility to install about 60 MW of solar rooftop capacity, and (iv) support for developing prospective renewable parks at Siyambalanduwa, Pooneryn and Mannar phase 2. ADB's Sri Lanka's energy sector operation is increasingly focusing its attention on increasing renewable energy penetration, energy efficiency,

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[4] The government of Sri Lanka took a cabinet decision to pursue necessary action to meet 70% of the total electricity demand of the country from renewable energy by 2030. (Office of the Cabinet of Ministers – Sri Lanka. 2021. *Press Briefing of Cabinet Decision Taken on 13 September 2021.* Colombo).

[5] Ministry of Power, Energy and Business Development. 2019. *National Energy Policy and Strategies of Sri Lanka*. Colombo.

[6] This includes solar, wind, biomass, and mini hydro power plants.

[7] ADB. 2019. *Sri Lanka: Energy Sector Assessment, Strategy, and Road Map.* Manila.

and supporting climate resilient infrastructures. These are emerging areas for the executing and implementing agencies in the country for which in-house capacity is still lacking.[8] Sri Lanka also need to further deregulate the power sector, introduce regulatory reforms to provide market-based incentives to mobilize private investments to the sector in a transparent and competitive manner. This includes provision of open access to transmission and distribution network for renewable energy generators and large consumers, renewable purchase obligations to large consumers and tradable renewable energy certificates to create additional revenues for investors in renewable energy. ADB can also provide transaction advisory services to structure renewable energy capacity procurement using highly successful solar park concept in India, where dedicated government agencies develop the basic infrastructure and invite the investments from private sector in a competitive basis.

7. The proposed TA will help the executing and implementing agencies to meet government and ADB financing requirements by supporting project preparation, improving project readiness, building capacity for implementation, and overall portfolio performance. This proposed TA will complement government agencies and build upon their strengths to develop and implement energy sector infrastructure projects in emerging areas. This TA supports the priorities of ADB Strategy 2030,[9] namely: (i) tackling climate change, building climate and disaster resilience and enhancing environmental sustainability; (ii) accelerating progress in gender equality by supporting activities and trainings to facilitate gender sensitive workplace practices and project components in project design; and (iii) strengthening governance and institutional capacity. This TA is listed in the current Sri Lanka country operations business plan.[10]

8. The impact of the ensuing projects will be supporting sustainable development of the energy sector through (i) increased renewable and cleaner power generation, (ii) improved quality of electricity, and (iii) enhanced energy security. The outcome of this TA is to develop ensuing projects into feasible investments to support the energy sector. These projects are in the energy sector and have similar due diligence requirements and implementation arrangements. The TA approach is suitable as it will allow (i) use of common resources to prepare and support projects in the same subsector, thereby enhancing project preparation and implementation efficiency; (ii) executing agency and implementing agencies to ensure adoption of uniform approach and project implementation arrangements; and (iii) smooth coordination between consultants and project team. Overall, this TA will reduce the transaction costs and time through minimizing the resources required of stand-alone transaction TA.

B. Outputs and Activities

9. **Output 1: Technical study on low-cost generation conducted and renewable energy roadmap developed.** This output will support activities to conduct technical studies, modelling and assessment for the potential low-cost generation that can be adopted into the country's power system in the immediate and medium-term to support government's target of achieving 70% renewables in power generation mix by 2030. This output will support the government in (i) developing renewable energy parks through competitive procurement to bring down the cost of renewables, (ii) recommending regulatory reforms, instruments and procurement strategy to reduce the generation cost and creating a framework for enabling development of renewable

[8] The Ministry of Power is the executing agency, Ceylon Electricity Board (CEB), Lanka Electricity Company (Pvt) Ltd. (LECO) and Sri Lanka Sustainable Energy Authority (SLSEA) are the implementing agencies for activities envisaged under the TA.

[9] ADB. 2018. *Strategy 2030: Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific*. Manila.

[10] ADB. 2020. *Country Operations Business Plan: Sri Lanka, 2021–2023.* Manila.

energy through private sector, (iii) conducting feasibility studies to develop grid scale battery storage and pumped hydro energy storage to integrate increasing share of renewables, and (iv) initiating assessment on emerging technologies such as floating solar and offshore wind for enhancing future renewable penetration. These studies will review the existing planning documents, identify network constraints, and propose optimal solutions to overcome them. This output will also complement ADB's ongoing rooftop solar generation project (footnote 2) by conducting due diligence on technical, economic, financial and safeguard aspects, provide support to conduct studies to eliminate the bottlenecks to enhance rooftop solar installations.

10. **Output 2: Financial and institutional capacity and gender sensitive work practices of power utilities improved.** This output will support the implementation of a financial roadmap prepared under proposed power system reliability strengthening project to support CEB in achieving financial sustainability and enhance CEB's asset and operation management capacities through implementation of an enterprise resource planning system. This output will also support the gender equality and social inclusion (GESI) interventions to be undertaken under the captioned projects. For the implementation of the GESI interventions, engaging with necessary consultants will be funded under the output. Technical expertise and capacity building will be provided through learning and sharing of national and international best practices.

11. **Output 3: Project preparatory due diligence for climate resilient power system investments completed.** Expertise required for due diligence activities for technical, procurement, financial, environment and social safeguards will be provided to support project preparation and implementation. Activities will include assistance for (i) technical study and analysis, (ii) procurement assessment, (iii) financial and economic analysis, (iv) preparing environmental assessments, resettlement plans, and indigenous peoples plans and other safeguards documents, as necessary, and (v) designing climate adaptation, mitigation, and disaster risk reduction measures.

C. Cost and Financing

12. The TA is estimated to cost $1,100,000, of which $1,000,000 will be financed by ADB's Technical Assistance Special Fund (TASF-Others) on a grant basis. The key expenditure items are listed in Appendix 1.

13. The government agencies responsible for each project will provide counterpart support in the form of counterpart staff, office space, office supplies, project-related information, and other in-kind contributions. Further, the implementing agencies of respective ensuing projects will be responsible for the preparation of detailed technical design of project components, technical specifications and bid documents to support project preparation. The government was informed that approval of the TA does not commit ADB to finance any ensuing project.

D. Implementation Arrangements

14. The Ministry of Power, Government of Sri Lanka will be the executing agency. Sri Lanka Sustainable Energy Authority (SLSEA) and CEB will be the implementing agencies for output 1[11] and CEB and LECO will be the implementing agencies responsible for outputs 2 and 3. The TA does not require logistical support and undertaking from Ministry of Power (MOP). TA activities for an ensuing project will start only after ADB approves the project concept paper on the ensuing

[11] SLSEA is expected to share feasibility studies and reports in relevant areas conducted earlier if any and provide inputs and expertise support for output 1.

project. ADB will administer the TA and will be responsible for the selection, supervision, monitoring and evaluation of consultants, and payments under the TA. However, this will be closely coordinated with the executing and implementing agencies. The implementation arrangements are summarized in Table 1.

Table 1: Implementation Arrangements

<table>
<tr><th>Aspects</th><th colspan="3">Arrangements</th></tr>
<tr><td>Indicative implementation period</td><td colspan="3">October 2021–December 2023</td></tr>
<tr><td>Executing agency</td><td colspan="3">MOP</td></tr>
<tr><td>Implementing agency</td><td colspan="3">CEB, LECO and SLSEA</td></tr>
<tr><td rowspan="3">Consultants[a]</td><td>Package title</td><td>Selection method</td><td>Engaged by</td></tr>
<tr><td rowspan="2">Individual selection</td><td>International: ICS (27 person-months)</td><td rowspan="2">ADB</td></tr>
<tr><td>National: ICS (63 person-months)</td></tr>
<tr><td>Disbursement</td><td colspan="3">The TA resources will be disbursed following ADB's Technical Assistance Disbursement Handbook (2020, as amended from time to time).</td></tr>
<tr><td>Asset turnover or disposal arrangement upon TA completion</td><td colspan="3">The assets purchased under this TA will be handed over to CEB and SLSEA upon TA completion.</td></tr>
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ADB = Asian Development Bank, CEB = Ceylon Electricity Board, ICS = individual consultant selection, LECO = Lanka Electricity Company (Pvt) Ltd., MOP = Ministry of Power, SLSEA = Sri Lanka Sustainable Energy Authority, TA = technical assistance.

[a] The number of consultants and person-months are based on preliminary estimates obtained from executing agency and implementing agency.

Source: Asian Development Bank.

15. **Consulting services.** ADB will engage consultants following the ADB Procurement Policy (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions. The TA will also support the required survey, site measurement instruments, purchase of software and simulation required for energy sector project preparation and capacity building activities.[12]

E. Governance

16. Since ADB will administer the TA, the financial management, procurement capacity, and integrity risks during TA implementation are assessed to be *low*. However, thorough risk assessments for procurement, financial management and integrity for ensuing investment projects will be conducted under the TA.

II. THE PRESIDENT'S DECISION

17. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $1,000,000 on a grant basis to Sri Lanka for Promoting Increased Renewable Energy Deployment, Energy Efficiency, and Power System Resilience, and hereby reports this action to the Board.

[12] Terms of Reference for Consultants (accessible from the list of linked documents in Appendix 3).

COST ESTIMATES AND FINANCING PLAN

($'000)

Item	Amount
A. Asian Development Bank	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	310.0
ii. National consultants	320.0
b. Out-of-pocket expenditures	
i. International and local travel	70.0
ii. Office space rental and related facilities	25.0
iii. Report and communications	10.0
iv. Miscellaneous administration and support costs	10.0
2. Surveys	70.0
3. Equipment	20.0
4. Software (planning, modelling, analysis software, license, etc.) [a]	35.0
5. Training, seminars, and conferences	70.0
6. Contingencies	60.0
Total	1,000.0

Note: The technical assistance is estimated to cost $1,100,000 of which contributions from the Asian Development Bank are presented in the table above. Implementing agencies will be asked to provide counterpart support in the form of counterpart staff, office space, office supplies, project-related information, and other in-kind contributions. The value of the government contribution is estimated to cost $100,000. Further, the implementing agencies of respective ensuing projects will be responsible for the preparation of detailed technical design of project components, technical specifications and bid documents to support project preparation.

[a] This software will be required for the analysis of renewable energy and distribution network, planning and design of renewable energy and future networks, technical studies for project preparation, and conducting technical due diligence of energy sector projects.

Source: Asian Development Bank.

PROJECTS UNDER TECHNICAL ASSISTANCE FACILITY

Table A2.1: Indicative Consultants' Input Allocation

(person-month)

Item Indicative risk category	Total	Project 1[a] low risk	Project 2[b] low risk	Project 3[c] Low risk
A. International	**31.5**	**14.5**	**12.0**	**5.0**
Energy Sector Advisor	4.0	2.0	2.0	0.0
Power System Engineer and Team Leader	5.0	2.0	2.0	1.0
Renewable Energy and Energy Storage Specialist	2.5	1.0	1.5	0.0
Power Distribution Specialist	3.0	1.0	1.0	1.0
Power Economist	3.0	1.5	1.5	0.0
Financial Specialist	3.0	1.5	1.5	0.0
Environment Specialist	3.5	1.5	1.0	1.0
Social Development Specialist	3.0	1.5	1.0	0.5
Biodiversity Specialist	2.5	1.5	0.0	1.0
Climate Change Expert	2.0	1.0	0.5	0.5
B. National	**63.0**	**29.0**	**23.0**	**11.0**
Renewable Energy and Energy Storage Specialist	5.0	2.0	3.0	0.0
Power System Specialist	5.0	2.5	2.0	0.5
Power System Modelling Specialist	6.0	3.0	2.5	0.5
Power Distribution Specialist	5.0	3.5	0.0	1.5
Power Economist	4.0	2.0	2.0	0.0
Financial Specialist	4.0	2.0	2.0	0.0
Environment Specialist	3.5	2.0	1.0	0.5
Social Development Specialist	4.0	2.0	1.5	0.5
Gender Equality and Social Inclusion Specialist	4.0	0.5	1.5	2.0
Procurement Specialist	3.5	2.0	1.0	0.5
Project Support Specialist	8.0	3.5	3.5	1.0
Project Implementation Analyst	8.0	2.5	2.0	3.5
Climate Change Expert	3.0	1.5	1.0	0.5
Total	**94.5**	**43.5**	**35.0**	**16.0**

[a] Project 1: Climate Resilient and Sustainable Energy Transition Project.
[b] Project 2: Additional financing for Rooftop Solar Generation Project.
[c] Project 3: Power System Reliability Strengthening Project.
Source: Asian Development Bank.

Table A2.2: Indicative Technical Assistance Budget Allocation (excluding consultants)

($'000)

Item Indicative risk category	Total	Project 1[a] low risk	Project 2[b] low risk	Project 3[c] complex
Training, seminars, and conferences	70.0	10.0	40.0	10.0
Equipment and software	55.0	10.0	45.0	0.0
Surveys	70.0	30.0	30.0	5.0
Total	**195.0**	**50.0**	**115.0**	**15.0**

[a] Project 1: Climate Resilient and Sustainable Energy Transition Project.
[b] Project 2: Additional Financing for Rooftop Solar Generation Project.
[c] Project 3: Power System Reliability Strengthening Project.
Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/LinkedDocs/?id=55079-002-TAReport

1. Terms of Reference for Consultants
2. Approved Project Concept Paper: Proposed Loan to the Democratic Socialist Republic of Sri Lanka for Power System Reliability Strengthening Project