ADB

Technical Assistance Report

Project Number: 54131-002
Transaction Technical Assistance Facility (F-TRTA)
November 2020

Republic of Maldives: Strengthening Capacity to Design and Implement Energy Sector Projects

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 22 October 2020)

Currency unit	–	rufiyaa (Rf)
Rf 1.00	=	$0.065
$1.00	=	Rf 15.45

ABBREVIATIONS

ADB	–	Asian Development Bank
LNG	–	liquefied natural gas
MW	–	megawatt
SAP	–	strategic action plan
TA	–	technical assistance

NOTE

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

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TRANSACTION TECHNICAL ASSISTANCE AT A GLANCE

1. Basic Data — **Project Number:** 54131-002

Project Name	Strengthening Capacity to Design and Implement Energy Sector Projects	**Department/Division**	SARD/SAEN
Nature of Activity	Project Preparation	**Executing Agency**	Ministry of Finance (formerly Ministry of Finance and Treasury)
Modality	Facility		
Country	Maldives		

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ Energy	Electricity transmission and distribution	0.25
	Renewable energy generation - solar	0.25
	Total	**0.50**

3. Operational Priorities

- ✓ Accelerating progress in gender equality
- ✓ Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability
- ✓ Making cities more livable
- ✓ Strengthening governance and institutional capacity
- ✓ Fostering regional cooperation and integration

Climate Change Information

GHG Reductions (tons per annum)	0
Climate Change impact on the Project	Low

ADB Financing

Adaptation ($ million)	0.10
Mitigation ($ million)	0.20

Cofinancing

Adaptation ($ million)	0.00
Mitigation ($ million)	0.00

Sustainable Development Goals

SDG 7.1
SDG 9.4
SDG 12.2
SDG 13.a

Gender Equity and Mainstreaming

Some gender elements (SGE) ✓

Poverty Targeting

General Intervention on Poverty ✓

4. Risk Categorization Complex

5. Safeguard Categorization Safeguard Policy Statement does not apply

6. Financing

Modality and Sources	Amount ($ million)
ADB	**0.50**
Transaction technical assistance: Technical Assistance Special Fund	0.50
Cofinancing	**0.00**
None	0.00
Counterpart	**0.00**
None	0.00
Total	**0.50**

Currency of ADB Financing: US Dollar

I. THE TECHNICAL ASSISTANCE FACILITY

A. Justification

1. **The proposal.** The transaction technical assistance (TA) facility will support project preparation, increase project readiness of pipeline projects, and support ongoing projects with additional expertise as required and agreed with the project executing agency. The TA will also provide support to ensure project sustainability and transfer capacity through specific training and skills-building activities as required. Initially, the TA facility will support:

(i) Preparing Outer Islands for Sustainable Development (POISED) Project,[1]
(ii) Additional financing for POISED project,[2] and
(iii) Greater Malé Energy Sector Project.[3]

2. **Sector overview.** Maldives, located 750 kilometers (km) southwest of Sri Lanka, is an archipelago consisting of 26 atolls[4] and a total land area of about 300 square km. About half of the country's population lives on the outer islands. Maldives has about 290 megawatts (MW) of installed diesel generation capacity in 186 inhabited islands, and additional generators in tourism (about 144 MW) and in industrial islands (20 MW). A total of 21.5 MW of renewable energy systems are installed across the country. The demand for electricity is expected to grow annually by 8.5%, out of which the Greater Malé region accounts for approximately 55% of the total projected electricity demand of all the inhabited islands. Generation capacity is not optimized due to lack of power interconnection between islands. Imported fossil fuels are by and large the most important source of energy for Maldives. Fuel imports account for about 10% of the country's gross domestic product (GDP), and approximately half of it is for power generation. The electricity generation costs are estimated in the range of 0.30–70 cents per kilowatt-hour (kWh) (depending on the island) and required government subsidies amounting to $58 million or 1.0% of GDP in 2019. The heavy diesel dependence of Maldives also makes its carbon emissions per unit of electricity among the highest in the region.

3. **Impacts of coronavirus disease.** The unprecedented economic shock caused by the coronavirus disease (COVID-19) pandemic has shown the vulnerabilities of the country's economic model. The energy sector has not been spared, with the finances of the utilities detrimentally affected by reduced demand from remunerative industrial and commercial consumers. This, coupled with poor bill collection rates, is expected to create significant cashflow shortfalls through first quarter of 2021. The real toll of the pandemic, however, is much higher, with thousands of livelihoods affected by the shutdown of tourism. Though oil prices have reduced

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[1] The POISED project is one of the largest energy sector intervention in Maldives which aims to introduce renewable energy-based grids in 160 outer islands. The project has already installed solar photovoltaic-battery-diesel hybrid systems including energy management systems and distribution grid upgrades in 70 islands. *Report and Recommendation of the President to the Board of Directors: Proposed Grant and Administration of Grant to the Republic of Maldives for the Preparing Outer Islands for Sustainable Energy Development Project.*

[2] The additional financing for POISED was approved on 29 October 2020, and will scale up renewable-energy-ready grid systems in additional outer islands, introduce disaster-resilient project components and gender-inclusive livelihood activities, and accelerate the pace of reform initiatives introduced in the current project.

[3] Greater Malé Energy Sector Project aims to introduce liquefied natural gas (LNG) in Greater Malé region for power generation. One of the South Asia Subregional Economic Cooperation (SASEC) flagship initiatives is development of a liquefied petroleum gas and LNG hub in Sri Lanka. Maldives can take advantage of this by importing LNG cargos from import terminals in South India or planned LNG terminal in Kerawalapitiya, Sri Lanka. The LNG import, regasification and distribution facilities developed in Sri Lanka and Maldives for power generation can help the LNG market to discover regional prices. The LNG supply sources being considered in South India and Sri Lanka are Kochi and Kerawalapitiya with an approximate distance of 400 nautical miles (nm) and 450 nm from Maldives.

[4] Maldives has 1,192 islands of which 194 islands are inhabited.

to historic low values due to the pandemic, the financial difficulties in the energy sector will remain as institutions and households struggle to pay their utility bills. The crisis further emphasizes the need to improve the sector's financial viability by reducing electricity generation costs.

4. **Government's vision.** Maldives' vision for the energy sector is the provision of sufficient, reliable, sustainable, secure, and affordable energy to all citizens. This vision is translated into three pillars: energy efficiency, renewable energy, and integration of technology innovation. The Maldives Energy Policy and Strategy 2016 and the Strategic Action Plan (SAP) 2019–2023[5] recognize investing in renewable energy and switching towards cleaner energy sources as vital steps to improve the national energy security. The SAP 2019–2023 also has a 2023 target to increase the share of renewable energy mix by 20% compared to 2018 levels, including a commitment to install a minimum of 10 MW of solar photovoltaic under net metering regulations, and 30 MWh of energy storage capacity to allow higher penetration of renewable energy.

5. The low carbon development roadmap for the energy sector of Maldives prepared under an ongoing ADB project[6] foresees interventions around the three pillars of the energy sector vision (para. 4). Renewable energy investments are unarguably the best solutions for outer islands. The main areas considered in future interventions include scaling up of solar photovoltaic penetration through private sector investments, mobilizing finances for battery storage and grid enhancement to create enabling environment for private sector, creating market infrastructure for net metering and pilot testing of future potential technologies applicable to Maldives. Limited space hampers the deployment of established low-cost renewable energy technologies such as solar photovoltaic in the Greater Malé region. The roadmap has also identified liquefied natural gas (LNG) as a cleaner substitute for power generation in the Greater Malé region where large scale deployment of renewables for power generation is constrained by space. Hence, the substitution of diesel with renewables and cleaner sources presents an important opportunity for the country to meet growing energy demand and reduce the corresponding increase in pollution.

6. **ADB's experience and energy sector priorities**. ADB has broad experience in Maldives through projects which support meeting electricity demand in the capital of Malé—such as the ongoing POISED project and the previously completed Outer Island Electrification (Sector) Project[7]— and various technical assistance programs. ADB's Maldives energy sector operation is increasingly focusing its attention on renewable energy, energy efficiency, and fuel diversification. These are relatively new areas for the executing and implementing agencies in the country for which in-house capacity is still lacking.[8] The lack of competencies within these organizations leads to delay in identifying the appropriate project components, project preparation, and approval; low readiness; and delayed benefits to the users. During implementation,[9] the ability to monitor the design aspects of the project is also weak. In addition, these projects to be prepared for ADB financing require due diligence, which includes preparing detailed technical specifications, cost–benefit analysis, financial and economic analysis, social and environmental

[5] The SAP 2019–2023 outlines the developmental targets and priorities of the government for the five-year period. Government of Maldives. 2019. *Strategic Action Plan (2019–2023)*. Malé.

[6] The roadmap is supported under the ongoing ADB's POISED project (footnote 1).

[7] ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Republic of Maldives for Outer Island Electrification (Sector) Project.* Manila.

[8] The Energy Department under the Ministry of Environment (MOE) is the executing agency, and Fenaka Corporation Limited (FENAKA) and State Electricity Company Limited (STELCO) are the implementing agencies for energy sector projects in Maldives.

[9] Although the ongoing POISED project has been supporting executing and implementing agencies with project implementation, capacity building activities such as workshops on renewable energy, classroom trainings, and supervisory and hands-on training, support is still required in the areas of planning, feasibility studies, design, design review and its verification to ensure development of viable and sustainable projects.

safeguards and documentation, climate change assessment (CCA) and climate risk and vulnerability assessment (CRVA), and procurement documents.

7. Enhancing and supplementing skills and competencies of the executing and implementing agencies are essential to improve project preparation, implementation, and overall portfolio performance. This proposed TA will support government agencies, continue to consolidate the positive actions, and build upon their strengths to develop and implement energy sector infrastructure projects from earlier TA resources. This TA supports the priorities of ADB Strategy 2030, namely: (i) making cities more livable by improving urban planning and financial sustainability of utilities; (ii) tackling climate change, building climate and disaster resilience and enhancing environmental sustainability; (iii) accelerating progress in gender equality by incorporating gender inclusive project components in project design; (iv) strengthening governance and institutional capacity; and (iv) regional cooperation and integration. This TA facility is listed in the current Maldives country operations business plan.[10]

8. The impact of the ongoing and ensuing projects will be supporting sustainable and enhanced socio-economic development of the country through: (i) increased renewable and cleaner power generation, (ii) improved quality of electricity, (iii) energy security, and (iv) reduced fiscal burden as envisaged in SAP 2019–2023. These projects are in the energy sector and have similar due diligence requirements and implementation arrangements. The TA facility 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 facility will reduce the transaction costs and time by reducing the resources required of stand-alone transaction TA.

B. Outputs and Activities

9. **Output 1: Survey and assessment to identify optimal liquefied natural gas facility and site completed.** Activities include survey and analysis to identify the type of LNG facility and suitable site for LNG infrastructure development with support from various experts. Based on the survey and assessment undertaken, technical report on type and capacity of LNG facility, technical specifications, engineering estimates, and other relevant details for potential LNG infrastructure will be prepared.

10. **Output 2: Power system planning, and detailed technical assessment of projects enhanced.** Activities include basic survey to ascertain the condition of existing network, network planning to optimize the network configuration, and determine transmission expansion requirements based on generation development scenarios and the demand forecast. Based on the network survey planning and simulation exercise, guidelines will be developed for the utility in conducting power system planning incorporating load flow and short circuit analysis, switching studies, protection coordination, and other related assessments, to ensure reliability of the power system.

11. **Output 3: Technical, procurement, financial, environment and social safeguards assessments completed.** Expertise for conducting due diligence for technical, procurement,

[10] ADB. 2019. *Maldives: Country Operations Business Plan (2020–2022)*. Manila. The TA facility was formerly named as Greater Malé Liquefied Natural Gas Feasibility Study Project in Maldives COBP 2020–2022 approved in July 2019.

financial, environment and social safeguards will be provided to support preparation and implementation of energy sector projects. Activities will include assistance for (i) technical study and analysis; (ii) procurement assessment; (iii) financial and economic analysis; (iv) preparing safeguards documents on environmental, involuntary resettlement, and indigenous peoples; and (v) designing climate adaptation, mitigation and disaster risk reduction measures.

12. **Output 4: Technical capacity of the executing and implementing agencies improved.** Technical expertise and capacity building will be provided to executing and implementing agencies with ongoing or ensuing projects, to enhance overall energy investments implementation and sustainability. Support will be provided through consultants, focusing on enhancing quality of project design by supporting surveys/studies, project monitoring by assisting in supervision, seminars, workshops, and on-the-job training activities benefiting staff of executing and implementing agencies of three projects supported under this proposed TA.

C. Cost and Financing

13. The TA facility is estimated to cost $550,000, of which $500,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-6). The key expenditure items are listed in Appendix 1.

14. 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. The government was informed that approval of the TA does not commit ADB to finance any ensuing project.

D. Implementation Arrangements

15. The Ministry of Finance, Government of Maldives will be the executing agency, and the Ministry of Environment (MOE) will be the implementing agency of the TA facility. The TA does not require logistical support and undertaking from MOE. TA activities for an ensuing project will start only after ADB approves the project concept paper on the ensuing project.

16. 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 executing and implementing agencies, including consent for recruiting the consultants for project preparation and implementation. The implementation arrangements are summarized in Table 1.

Table 1: Implementation Arrangements

Aspects	Arrangements		
Indicative implementation period	November 2020–October 2022		
Executing agency	Ministry of Finance		
Implementing agency	Ministry of Environment		
Consultants	To be selected and engaged by IA and ADB		
	ICS (international)	(20 person-months)	$200,000
	ICS (national)	(24 person-months)	$60,000
Disbursement	The TA resources will be disbursed following ADB's *Technical Assistance Disbursement Handbook* (2020, as amended from time to time).		

Aspects	Arrangements
Asset turnover or disposal arrangement upon TA completion	The assets purchased under this TA will be handed over to the Ministry of Environment upon TA completion.

ADB = Asian Development Bank, IA = implementing agency, ICS = individual consultant selection, TA = technical assistance.
Source: Asian Development Bank.

17. **Consulting services.** The TA facility will provide an initial 44 person-months of consulting services (20 person-months international and 24 person-months national)[11] in the field of LNG design, renewable energy studies, power system planning, and due diligence support for procurement, financial management, financial analysis, economic analysis, environment and social safeguard assessment, and climate change assessment, and climate risk and vulnerability assessment. The TA will also support the required survey, purchase of software and simulation required for energy sector project preparation and capacity building activities. It is expected that the consultants will be recruited using individual consultant selection method and deployed based on the requirements during project preparation and implementation. ADB will engage the consultants following the ADB Procurement Policy (2017, as amended from time to time) and its associated project administration instructions and/or staff instructions. Except for the survey activities for LNG,[12] individual consultant selection is appropriate in this instance because the TA facility involves multiple activities that are not necessarily interdependent and will require a varied range of consultants and services. However, where suitable, recruitment through a firm might be considered.

E. Governance

18. Since ADB will administer the TA facility, the financial management, procurement capacity, and integrity risks during TA facility 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 facility.

II. THE PRESIDENT'S DECISION

19. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of $500,000 on a grant basis to Maldives for Strengthening Capacity to Design and Implement Energy Sector Projects, and hereby reports this action to the Board.

[11] TA facility savings may be utilized for additional consultant inputs, as may be necessary.
[12] The offshore survey and hydrodynamic study require specialized equipment, and trained equipment operators and technicians. Hence, it is recommended to engage a firm with experience working in ocean waters to carry out this marine survey assignment.

COST ESTIMATES AND FINANCING PLAN

($'000)

Item	Amount
A. Asian Development Bank	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	200.0
ii. National consultants	60.0
b. Out-of-pocket expenditures	
i. International and local travel	35.0
ii. Report and communications	3.0
iii. Miscellaneous administration and support costs[a]	2.0
2. Surveys[b]	110.0
3. Goods (network planning, modelling, analysis software, license and IT equipment)[c]	50.0
4. Training, seminars, and conferences	20.0
5. Contingencies	20.0
Total	500.0

IT = information technology

Note: The technical assistance is estimated to cost $550,000 of which contributions from the Asian Development Bank (ADB) 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 account for 10% of the contribution from ADB.

[a] This will be used for purchase of office supply items for national consultants stationed at the executing agency's office.

[b] The site selection for liquefied natural gas (LNG) infrastructure development requires offshore survey and hydrodynamic studies to ascertain technical parameters required for LNG power generation infrastructure and its associated facilities. Therefore, it is recommended to engage a firm with expertise, equipment, and experience in working in ocean waters to carry out this marine survey assignment. The cost estimates are for survey and assessment for two sites, and the details of the survey, number of sites, scope of survey will be prepared by the LNG expert hired under this TA, hence cost estimate is expected to be revised as per expert assessment.

[c] This software will be required for the analysis of distribution network, planning and design of 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]** complex	**Project 2[b]** low risk	**Project 3[c]** low risk
A. International[d]	**20.0**	**12.0**	**2.0**	**6.0**
Gas Sector Expert (Team Leader)[e]	2.0	2.0	0.0	0.0
Power Sector Specialist (Transmission & Generation)	2.0	1.0	0.5	0.5
Marine Expert	1.5	1.5	0.0	0.0
LNG Commercial Expert	2.5	2.0	0.0	0.5
LNG Transmission Design Expert	1.0	1.0	0.0	0.0
Renewable Energy Expert	3.5	0.0	1.5	2.0
Energy Economist	2.0	1.0	0.0	1.0
Financial Management Specialist	2.0	1.0	0.0	1.0
Environmental Specialist	2.0	1.5	0.0	0.5
Social Development Specialist	1.5	1.0	0.0	0.5
B. National	**24.0**	**14.0**	**2.5**	**7.5**
Project Manager	9.0	6.0	0.0	3.0
Social and Gender Specialist	5.0	3.0	1.0	1.0
Environmental Specialist	5.0	3.0	1.0	1.0
Power System Specialist	5.0	2.0	0.5	2.5
Total	**44.0**	**26.0**	**4.5**	**13.5**

LNG = liquefied natural gas

[a] Project 1: Greater Malé Energy Sector Project (pipeline project).

[b] Project 2: Preparing Outer Islands for Sustainable Energy Development (POISED) Project (ongoing project).

[c] Project 3: POISED Project – Additional Financing (approved in October 2020).

[d] The ongoing POISED project has a well-established PMU and team leader.

[e] The team leader is only responsible for overall guidance and coordination with the technical and commercial experts (power sector specialist, marine expert, LNG commercial expert, and LNG transmission design expert) supporting LNG project preparation.

Source: Asian Development Bank.

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

($'000)

Item Indicative risk category	**Total**	**Project 1**[a] complex	**Project 2**[b] low risk	**Project 3**[c] low risk
Surveys	110.0	90.0	0.0	20.0
Training, seminars, and conferences	20.0	10.0	5.0	5.0
Network planning, modelling, analysis software, license and IT equipment	50.0	30.0	10.0	10.0
Total	**180.0**	**130.0**	**15.0**	**35.0**

IT = information technology

[a] Project 1: Greater Male Energy Sector Project (pipeline project).

[b] Project 2: Preparing Outer Islands for Sustainable Energy Development (POISED) Project (ongoing project).

[c] Project 3: POISED Project – Additional Financing (pipeline project).

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/LinkedDocs/?id=54131-002-TAReport

1. Terms of Reference for Consultants
2. Approved Report and Recommendation of the President: Proposed Grant and Administration of Grant to the Republic of Maldives for the Preparing Outer Islands for Sustainable Energy Development Project
3. Approved Report and Recommendation of the President: Proposed Loan and Grant for Additional Financing to the Republic of Maldives for the Preparing Outer Islands for Sustainable Energy Development Project