



# Report and Recommendation of the President to the Board of Directors

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Project Number: 46122-005  
October 2020

## Proposed Loan and Grant for Additional Financing Republic of Maldives: Preparing Outer Islands for Sustainable Energy Development Project

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Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 30 July 2020)

Currency unit	–	rufiyaa (Rf)
Rf1.00	=	\$0.06
\$1.00	=	Rf15.40

## ABBREVIATIONS

ADB	–	Asian Development Bank
COVID-19	–	coronavirus disease 2019
GAP	–	gender action plan
GDP	–	gross domestic product
MOE	–	Ministry of Environment
MOF	–	Ministry of Finance
MW	–	megawatt
PAM	–	project administration manual
PMU	–	project management unit
STELCO	–	State Electricity Company Limited

## NOTE

In this report, "\$" refers to United States dollars.

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## PROJECT AT A GLANCE

1. Basic Data		Project Number: 46122-005	
Project Name	Preparing Outer Islands for Sustainable Energy Development Project - Additional Financing	Department/Division	SARD/SAEN
Country	Maldives	Executing Agency	Ministry of Finance (formerly Ministry of Finance and Treasury)
Borrower	Maldives		
Country Economic Indicators Portfolio at a Glance	<a href="https://www.adb.org/Documents/LinkedDocs/?id=46122-005-CEI">https://www.adb.org/Documents/LinkedDocs/?id=46122-005-CEI</a> <a href="https://www.adb.org/Documents/LinkedDocs/?id=46122-005-PortAtaGlance">https://www.adb.org/Documents/LinkedDocs/?id=46122-005-PortAtaGlance</a>		
2. Sector		ADB Financing (\$ million)	
✓ Energy	Subsector(s) Energy efficiency and conservation Renewable energy generation - solar		2.97 7.50
		Total	10.47
3. Operational Priorities		Climate Change Information	
✓ Addressing remaining poverty and reducing inequalities		GHG reductions (tons per annum)	4,501
✓ Accelerating progress in gender equality		Climate Change impact on the Project	Low
✓ Tackling climate change, building climate and disaster resilience, and enhancing environmental sustainability			
✓ Strengthening governance and institutional capacity			
		ADB Financing	
		Adaptation (\$ million)	2.65
		Mitigation (\$ million)	7.82
		Cofinancing	
		Adaptation (\$ million)	0.00
		Mitigation (\$ million)	0.00
Sustainable Development Goals		Gender Equity and Mainstreaming	
SDG 5.b		Effective gender mainstreaming (EGM)	✓
SDG 7.3			
SDG 9.1			
SDG 12.2			
SDG 13.a			
		Poverty Targeting	
		General Intervention on Poverty	✓
4. Risk Categorization:		Low	
5. Safeguard Categorization		Environment: C Involuntary Resettlement: C Indigenous Peoples: C	
6. Financing			
Modality and Sources		Amount (\$ million)	
ADB		10.47	
Sovereign Project grant: Asian Development Fund		2.73	
Sovereign Project (Concessional Loan): Ordinary capital resources		7.74	
Cofinancing		0.00	
None		0.00	
Counterpart		0.53	
Government		0.53	
Total		11.00	
Currency of ADB Financing: US Dollar			

## I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan and a proposed grant, both to the Republic of Maldives for the additional financing of the Preparing Outer Islands for Sustainable Energy Development Project.<sup>1</sup>

2. The project finances the replacement of inefficient diesel-based power generation grids in 160 outer islands of Maldives and in Malé with renewable-energy-ready grid systems (solar photovoltaic–battery–diesel hybrid generation), energy management systems, and upgraded distribution grids. The proposed additional financing will scale up and change the scope of the current project by (i) scaling up renewable-energy-ready grid systems<sup>2</sup> in additional outer islands;<sup>3</sup> (ii) introducing disaster-resilient project components and gender-inclusive livelihood activities; and (iii) accelerating the pace of reform initiatives introduced in the current project through pilot projects and policy measures.

## II. THE PROJECT

### A. Rationale

3. Maldives is one of the world's most geographically dispersed countries with 1,192 islands spread across 800 kilometers of ocean. This dispersion and the small size of most inhabited islands make it extremely challenging to generate electricity centrally and distribute it through a comprehensive grid network to realize economies of scale. The generation costs are estimated at \$0.30–\$0.70 per kilowatt-hour (depending on the island),<sup>4</sup> and this required government subsidies of \$58 million or 1% of gross domestic product (GDP) in 2019. Fossil fuel imports account for about 10% of the country's GDP, about half of this is for electricity generation, followed by about 40% for the transport sector.<sup>5</sup> The heavy diesel dependence of Maldives also makes its carbon emissions per unit of electricity among the highest in the region. As a low-lying archipelago, with an average elevation of 1.5 meters above sea level, Maldives is one of the most vulnerable countries globally to climate and disaster risks. Maldives consistently faces risk of small-scale and recurrent hazards, such as excessive precipitation, cyclonic winds, storm surges, saltwater intrusion, and coastal flooding. It is estimated that Maldives may face an annual loss of up to a 2.3% of GDP by 2050 because of the impacts of climate change.<sup>6</sup>

4. To improve energy security, the government has committed to increase the use of renewable energy and promote energy efficiency. The current project has played a vital role in escalating the penetration of renewable energy in Maldives from less than 0.1 megawatt (MW) in 2008 to more than 21.5 MW in 2020. The project was approved by the Asian Development Bank (ADB) Board of Directors on 29 September 2014, financed through a grant from the ADB Special Funds resources (Asian Development Fund) not exceeding \$38.0 million, and a grant from the Strategic Climate Fund, administered by ADB, of \$12.0 million. The first additional cofinancing was approved on 19 March 2015 and consisted of a grant of \$5 million from the Japan Fund for

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<sup>1</sup> The design and monitoring framework is in Appendix 1.

<sup>2</sup> Diesel generators are not financed under this additional financing.

<sup>3</sup> Outer islands are the islands in the atolls outside the Greater Malé region.

<sup>4</sup> Estimated during the feasibility studies of ongoing POISED project by Project Management Unit (PMU) under Ministry of Environment.

<sup>5</sup> Being a marine nation, whose territory is 90% water, Maldives is heavily dependent on sea transport for accessing services as well as trading goods and for commuting. The consumption of diesel in sea transport has grown from 149,000 tons in 2017 to 195,000 tons in 2019.

<sup>6</sup> Asian Development Bank (ADB). 2014. [\*Assessing the Costs of Climate Change and Adaptation in South Asia\*](#). Manila.

Joint Crediting Mechanism, administered by ADB. The current project and the first additional financing remain ongoing, with the grants expected for closure in the first quarter of 2021.<sup>7</sup> The objective of the current project is a shift towards clean and cost-effective energy sources. The current project finances the replacement of inefficient diesel-based power generation grids in 160 outer islands of Maldives and in Malé with renewable-energy-ready grid systems, energy management systems, and upgraded distribution grids. These interventions will contribute to reducing the cost of electricity, the subsidy burden on the government budget, and emissions, and will diversify the power generation mix. The project has two outputs: (i) renewable-energy-ready grid systems developed for outer islands and the Greater Malé region; and (ii) capacity of the Ministry of Environment (MOE) and the utilities—the State Electricity Company Limited (STELCO) and FENAKA Corporation Limited<sup>8</sup>—to implement renewable energy grid interventions enhanced.

5. The current project has installed more than 9.5 MW of solar photovoltaic capacity, 5.6 megawatt-hours of battery storage, and 11.6 MW of energy-efficient diesel generators and associated investments covering 70 outer islands across eight atolls. Also, the project supported the government in developing a low-carbon development road map<sup>9</sup> for the energy sector; initiating regulatory reforms; and improving the capacity of the MOE, FENAKA, and STELCO focusing on renewable energy. The additional financing will be prioritized in providing optimal renewable-energy-based solutions targeting islands (i) operating purely on inefficient diesel generators; (ii) with heavy demand for ice to support fisheries; and (iii) pilot testing innovative components which have potential for future replication.

6. **Strengthening climate and disaster resilience.** The low elevation combined with the narrow width of the islands makes power system infrastructure vulnerable to flooding and other natural hazards. At the community level, Maldives' high exposure to natural hazards and extreme weather together with vulnerabilities in fisheries (the main economic activity for the outer islands) presents significant challenges. Frequent rough seas and inclement weather during the northeast monsoon (December–March) and the southwest monsoon (May–November), insufficient power supply and frequent power outages, and the limited availability of ice-making plants for cold storage on outer islands prevent fishers from transporting their catch to larger islands for processing and sale. Strengthening energy security, together with cold storage capacity, is needed to enhance the resilience of livelihoods and, by extension, the wider community on outer islands.

7. **Eligibility for additional financing.** The project meets the eligibility criteria for additional financing. The project components to be supported through additional financing are (i) technically feasible, economically viable, and financially sound; (ii) accorded as high priority by the government; (iii) consistent with the project's development objectives; and (iv) aligned with ADB's country partnership strategy.<sup>10</sup> The implementation of the current project is progressing well with

<sup>7</sup> The original closing date for Grant 0409-MLD and Grant 0410-MLD was 30 June 2020, extended until 31 March 2021. The original closing date of Grant 0429-MLD was 31 December 2019 and is on its second extension with a closing date of 31 March 2021.

ADB. 2014. [\*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\*](#). Manila.

<sup>8</sup> STELCO and FENAKA are the main electricity utilities responsible for supplying electricity to the communities of inhabited islands in Maldives.

<sup>9</sup> Though the road map was approved by the ministry in May 2019, there was a request from the new government to revise the road map to align with the Strategic Action Plan 2019–2023. Revision is in progress and the road map is expected to be published by October 2020.

<sup>10</sup> ADB's country partnership strategy, 2020–2024 is yet to be approved by the Board.

total commitments of \$52.36 million (95.20%) and disbursements of \$45.61 million (82.93%) as of 9 July 2020.<sup>11</sup> The project has commissioned renewable-energy-ready grid systems, including energy management system and grid upgrades in 70 islands. The project is on track to meet the expected outputs and is compliant with ADB's Safeguard Policy Statement (2009) requirements. The project has been rated *satisfactory* in the project performance ratings since 2016, and the identified risks of the project have been managed adequately.<sup>12</sup> Hence, the current project is rated *performing well*. Additional financing is assessed as the suitable modality for this support considering the strong links with the current project design, reform initiatives, and well-established implementation agreements, which promise large efficiency gains.

8. **COVID-19 impact.** The global pandemic resulting from the novel coronavirus disease (COVID-19) has significantly impacted the country's economy. The energy sector has not been spared, with the finances of the utilities detrimentally affected by reduced demand from remunerative industrial and commercial consumers. Coupled with poor bill collection rates,<sup>13</sup> this is expected to create significant cash flow shortfalls through the 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 fallen to historic low values because of 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, which can be achieved by facilitating renewable energy investments as envisaged by the project.

9. **Alignment with ADB and government priorities.** The additional financing is well-aligned with ADB's Strategy 2030<sup>14</sup> operational priorities of (i) tackling climate change and building climate and disaster resilience by reducing carbon dioxide emissions using indigenous renewable generation and climate-adaptive and disaster risk reduction investments to improve resilience, (ii) accelerating progress in gender equality by creating gender-equal and socially inclusive income-generation activities using renewable mini grids in remote islands, and (iii) promoting development of remote islands by introducing sustainable energy sources and creating economic opportunities in rural areas. The investment will support the achievement of nationally determined contributions<sup>15</sup> targets and is also aligned with the country's Strategic Action Plan 2019–2023<sup>16</sup> by expanding the renewable energy subsector and improving energy security through diversification of sources of energy production. The project will support Sustainable Development Goals 5 and 7 by providing affordable and clean energy; improving efficiency through distribution grid upgrades, energy management systems, and battery storage; and creating gender-equal and socially inclusive income-generation opportunities. The current project and the additional financing are well-

<sup>11</sup> Total commitment is \$35.77 million for Grant 0409-MLD and \$4.59 million for Grant 0429-MLD. Disbursements achieved for Grants 0409 and 0429 are at \$32.65 million and \$0.96 million. Grant 0410-MLD (\$12 million) has been fully disbursed and was financially closed on 31 July 2019.

ADB. 2014. [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](#). Manila.

<sup>12</sup> The project has been meeting financial requirements, such as timely submission of audited project financial statements with unqualified audit opinions on project financial statements, however there are qualified opinions on the submitted audited entity financial statements of STECLO and FENAKA and some of the financial covenants are to be met. These are being addressed through initiatives in the current project.

<sup>13</sup> The bill collection rates were reduced to 60% from 90% based on data from STELCO and FENAKA.

<sup>14</sup> ADB. 2018. [Strategy 2030 Achieving a Prosperous, Inclusive, Resilient, and Sustainable Asia and the Pacific](#). Manila.

<sup>15</sup> The Maldives' nationally determined contributions submitted to the United Nations Framework Convention on Climate Change established the country's intention to reduce its emissions by 10% from business as usual by 2030 unconditionally and by 24% with international support.

<sup>16</sup> Government of Maldives. 2019. [Strategic Action Plan \(2019-2023\)](#). Malé.

coordinated with the current and planned renewable energy interventions of other development partners.<sup>17</sup>

## B. Project Description

10. The impact and outcome of the overall project remain the same as defined in the current project design. Following the current project, the additional financing will finance selected subprojects on the basis of eligibility criteria agreed between ADB and the government. The additional financing will scale up and change the scope of outputs 1 and 2 (paras. 11–12).

11. **Output 1: Renewable-energy-ready grid systems developed for outer islands and the Greater Malé region.** The additional financing will scale up this output by introducing renewable-energy-ready grid systems with grid upgrades, energy management systems, and supervisory control and data acquisition (SCADA) systems in additional 12 outer islands. The output's scope will also be expanded to include (i) installation of solar-photovoltaic-based ice-making machines for four outer islands to support fisheries (the main economic activity in the outer islands), (ii) development of a climate- and disaster-resilient distribution system<sup>18</sup> in one outer island, and (iii) pilot testing of a renewable-energy-operated ferry<sup>19</sup> for transport of 30–40 passengers propelled by a combination of solar-photovoltaic panels and batteries, which has high potential for future replication.

12. **Output 2: Capacity of the Ministry of Environment, State Electricity Company Limited, and FENAKA to implement renewable energy grid interventions enhanced.** The additional financing will continue to support the project management unit (PMU) within the MOE to ensure close project monitoring and implementation of the overall project.<sup>20</sup> Capacity building support to the MOE will be included for project monitoring and implementation, along with assistance for planning, designing, and implementing disaster-resilient project components.

## C. Value Added by ADB

13. ADB has broad experience in Maldives through the current project, previous projects such as the Outer Island Electrification (Sector) Project,<sup>21</sup> support in meeting electricity demand in the capital of Malé, and various technical assistance programs. ADB has experience in financing hybrid mini grids in rural and island-based communities in South Asia and Pacific countries.<sup>22</sup>

<sup>17</sup> The World Bank's Accelerating Sustainable Private investments in Renewable Energy Project was concentrating purely on solar photovoltaic installations through the private sector in the Greater Malé region, and its planned intervention is similar to the project design focusing on hybrid systems.

<sup>18</sup> The climate- and disaster-resilient distribution system intervention supports the replacement of disaster-prone old radial distribution systems with a ring system, introducing flow meters for generators, smart metering with automatic metering infrastructure, filters, and lightning protection devices to improve reliability and monitoring and allow high penetration of renewable energy.

<sup>19</sup> The population in outer islands and tourist resorts is heavily dependent on sea transport for commuting between islands. Approximately 20% of the important fossil fuels is used for passenger ferries and boats, which also makes sea transport expensive.

<sup>20</sup> The \$50 million loan financed by the European Investment Bank, one of the cofinanciers, was made effective by the government only on 21 November 2019. The support for the PMU through additional financing will ensure implementation of the entire project.

<sup>21</sup> 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.

<sup>22</sup> The following are some of the similar interventions in South Asia and Pacific regions: ADB. 2016. [Report and Recommendation of the President to the Board of Directors: Proposed Loan to the Democratic Socialist Republic of Sri Lanka for the Supporting Electricity Supply Reliability Improvement Project](#). Manila (Loan 3409-SRI, supported



ADB will be able to share the lessons learned and experiences gained and translate these experiences into robust project design and implementation. ADB's experience in developing mini grid interventions using available indigenous energy resources to support gender-inclusive livelihood activities will also be explored, particularly through the introduction of ice-making machines to support fisheries. Innovative project components such as climate- and disaster-resilient distribution systems (footnote 17), a renewable-energy-operated ferry, and enhanced hybrid lithium-ion batteries<sup>23</sup> will be introduced into the mini grid systems to adapt to extreme weather conditions and improve the emergency preparedness of the outer islands. This will also increase the capability of the government to support essential services, such as health care, water supply, and communications, during emergency situations such as COVID-19 and extreme weather where outer islands are isolated from the Greater Malé region. These proposed interventions are identified in the road map prepared for low-carbon development of the energy sector of Maldives under the current project and will add value in responding to crisis situations such as COVID-19 by improving community and system resilience. The action plan developed during processing of this additional financing will set out key reforms with milestones to support institutional strengthening and policy enhancement.

#### D. Summary Cost Estimates and Financing Plan

14. The overall project is estimated to cost \$130 million (Table 1). Detailed cost estimates by expenditure category and by financier are included in the project administration manual (PAM).<sup>24</sup>

**Table 1: Summary Cost Estimates**  
(\$ million)

Item	Current Amount <sup>a</sup>	Additional Financing <sup>b</sup>	Total
<b>A. Base Cost<sup>c</sup></b>			
1. Renewable-energy-ready grid systems developed	101.4	9.3	110.7
2. Capacity enhanced	4.9	0.6	5.5
<b>Subtotal (A)</b>	<b>106.3</b>	<b>9.9</b>	<b>116.2</b>
<b>B. Contingencies<sup>d</sup></b>	<b>11.0</b>	<b>1.0</b>	<b>12.0</b>
<b>C. Financing Charges During Implementation<sup>e</sup></b>	<b>1.7</b>	<b>0.1</b>	<b>1.8</b>
<b>Total (A+B+C)</b>	<b>119.0</b>	<b>11.0</b>	<b>130.0</b>

<sup>a</sup> Refers to the original amount and first additional financing. Despite additional financing being processed, the total cost decreased from \$129 million to \$119 million because of reallocation of \$10 million from the Islamic Development Bank.

<sup>b</sup> Includes the goods and service tax of \$0.4 million to be financed by the government and excludes the import duties of 15% to be exempted by the government.

<sup>c</sup> In mid-2020 prices as of July 2020 for the additional financing.

<sup>d</sup> For the additional financing, physical contingencies are computed at 6.2% of the base cost. Price contingencies are computed at 1.6%–1.7% on foreign exchange costs and 1.2% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

<sup>e</sup> The interest rate for the concessional ordinary capital resources loan for the additional financing has been computed at 1% per year.

Source: Asian Development Bank estimates.

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hybrid energy systems in Sri Lanka's northern islands JFPR 9196, supported reverse osmosis seawater desalination plant in Nainativu); ADB. 2009. *Technical Assistance for Effective Deployment of Distributed Small Wind Power Systems in Asian Rural Areas*. Manila (TA 7485-REG); ADB. 2013. *Report and Recommendation of the President to the Board of Directors: Proposed Grant to the Kingdom of Tonga for the Outer Island Renewable Energy Project*. Manila; and ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Proposed Loan to Cook Islands for the Renewable Energy Sector Project*. Manila.

<sup>23</sup> Advanced lithium-ion chemistries using lithium titanite will be considered to provide a long lifetime, adapt to extreme weather, and allow additional penetration of renewable energy.

<sup>24</sup> Project Administration Manual (accessible from the list of linked documents in Appendix 2).

15. The government has requested (i) a concessional loan in various currencies equivalent to SDR5,502,000 (\$7.74 million) from ADB's ordinary capital resources, and (ii) a grant not exceeding \$2.73 million from ADB's Special Funds resources (Asian Development Fund) to help finance the project. The concessional loan will have a 32-year term, including a grace period of 8 years; an interest rate of 1.0% per year during the grace period and 1.5% per year during the amortization period; and such other terms and conditions set forth in the concessional loan and project agreements.

16. The summary financing plan is in Table 2. ADB will finance the expenditures in relation to works, equipment, consulting services, and contingencies. The government will finance taxes and duties and interest during implementation. The government has assured that it will meet any financing shortfall to ensure that project outputs are fully achieved.

**Table 2: Financing Plan**

Source	Current <sup>a</sup>		Additional Financing		Total	
	Amount (\$ million)	Share of Total (%)	Amount (\$ million)	Share of Total (%)	Amount (\$ million)	Share of Total (%)
Asian Development Bank						
Ordinary capital resources (concessional)	0.0	0.0	7.74	70.2	7.74	6.0
Special Funds resources (grant)	38.0	31.9	2.73 <sup>b</sup>	24.8	40.73	31.3
ADB Strategic Climate Fund	12.0	10.1	0.00	0.0	12.00	9.2
Japan Fund for the Joint Crediting Mechanism	5.0	4.2	0.00	0.0	5.00	3.8
European Investment Bank	50.0	42.0	0.00	0.0	50.00	38.5
Islamic Development Bank	0.0	0.0	0.00	0.0	0.00	0.0
Government of Maldives	14.0	11.8	0.53	5.0	14.53	11.2
<b>Total</b>	<b>119.0</b>	<b>100.0</b>	<b>11.00</b>	<b>100.0</b>	<b>130.00</b>	<b>100.0</b>

<sup>a</sup> Refers to the original amount and any previous additional financing and withdrawal of Islamic Development Bank loan.

<sup>b</sup> To be financed by the Asian Development Fund 12 disaster risk reduction funding.

Source: Asian Development Bank estimates.

17. Climate mitigation is estimated to cost \$7.82 million, and climate adaptation is estimated to cost \$2.65 million. The entire ADB financing of \$10.47 million will support mitigation and adaptation costs. The investments are designed to withstand small-scale and recurrent hazards, such as excessive precipitation, cyclonic winds, storm surges, saltwater intrusion, and coastal flooding.

## **E. Implementation Arrangements**

18. The overall implementation arrangements of the additional financing will remain the same as for the current project. The Ministry of Finance (MOF) will be the executing agency. The MOE, FENAKA, and STELCO will be the key implementing agencies. The MOE will administer the loan and grant proceeds and will be responsible for procurement and implementation. The activities of FENAKA and STELCO will be financed through counterpart funds. A PMU within the MOE, comprising officials from the implementing agencies, has been set up to coordinate the project activities with experts in the areas of finance, technology, and contract management. The PMU will continue to organize training programs to build the institutional capacity of FENAKA and STELCO in the remaining islands,<sup>25</sup> and will be responsible for monitoring the implementation. The project departments of FENAKA and STELCO will continue to support the PMU as project implementation units in reviewing feasibility studies and designs, bid evaluation as team

<sup>25</sup> The PMU will support the project implementation of the additional financing and the European Investment Bank loan to cover the project implementation in 160 islands.

members, and project supervision during implementation. The PMU will also be responsible for overall intra-agency coordination. The project implementation units will provide project implementation support to contractors and will liaise with the islands where the project will be implemented. The procurement packages in the additional financing were identified under the current project and the procurement arrangements of the current project will be followed by the additional financing.<sup>26</sup>

19. The implementation arrangements are described in detail in the PAM (footnote 20).

**Table 3: Implementation Arrangements**

Table of Implementation Arrangements			
Aspects	Arrangements		
Implementation period	November 2020–March 2024		
Estimated completion date	30 September 2023		
Estimated loan and grant closing date	31 March 2024		
Management			
(i) Oversight body	Project steering committee chaired by MOE and comprising members from MOE, MOF, and the Ministry of National Planning housing and Infrastructure of the Government of Maldives, head of the Maldives Energy Authority, and senior management staffs from FENAKA and STELCO		
(ii) Executing agency	MOF, Government of Maldives		
(iii) Implementing agencies	MOE, FENAKA, and STELCO		
(iv) Implementation unit	Project management unit located at MOE with support from FENAKA and STELCO		
Procurement	International competitive bidding	3 contracts	\$9.75 million
Consulting services	Competitive (individual consultants)	84 national person-months, 40 international person-months	\$0.55 million
Retroactive financing and/or advance contracting	ADB has approved advance contracting. Retroactive financing is permissible up to 20% of the loan and grant amount for expenditures incurred prior to loan and grant effectiveness for works and consulting services, but not earlier than 12 months before the signing of the loan agreement.		
Disbursement	The loan and grant proceeds will be disbursed following ADB's <i>Loan Disbursement Handbook</i> (2017, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

ADB = Asian Development Bank, FENAKA = FENAKA Corporation Limited, MOE = Ministry of Environment, MOF = Ministry of Finance, STELCO = State Electricity Company Limited.

Source: ADB estimates.

### III. DUE DILIGENCE

#### A. Technical

20. ADB staff undertook technical due diligence to establish the need for the additional financing in the context of supporting the government to attain Strategic Action Plan 2019–2023 goals. ADB supported the MOE in conducting the feasibility studies and simulation to ascertain that the project components provide the optimal solution for the investments. The technology and design selected is proven in Maldives, including its compatibility with local conditions, through ongoing projects where similar installations were successfully commissioned in 70 outer islands.

<sup>26</sup> The procurement will follow the current project and will be undertaken in conformity with ADB's Procurement Guidelines (2015, as amended from time to time) and ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).

The project design has incorporated measures and elements to address climate change, increase climate and disaster resilience, and enhance environmental sustainability.

## **B. Economic and Financial Viability**

21. **Economic viability.** The economic analysis was carried out in accordance with ADB's Guidelines for the Economic Analysis of Projects.<sup>27</sup> Without the project, power demand would be served through existing inefficient diesel-based energy mini grids, which have additional costs associated with diesel-based generation, transport cost of fuel to remote islands, capital replacement, spare parts, and lubrication oil. The hybrid renewable energy systems with relatively low operating costs will displace diesel generators. Benefits identified are (i) avoided fuel costs when diesel-based generation is offset by equivalent amounts of renewable generation and (ii) the environmental benefits from reduced carbon dioxide emissions. The economic analysis indicates an economic internal rate of return of 17.7% in constant 2020 prices. Given a hurdle rate of 9%, the project is deemed economically viable based on risk and sensitivity analyses.<sup>28</sup>

22. **Financial viability.** A financial cost–benefit analysis was conducted in accordance with ADB's Guidelines on the Financial Management and Analysis of Projects.<sup>29</sup> The project will improve financial and operational performance of the power utilities through reduction in fuel and other variable costs such as repairs, maintenance, and replacement of parts. Without the project, the power utilities would continue to pay for expensive fuel and incur high operating costs. Project cash flows are calculated by subtracting projected cash flows for the without-project scenario from projected cash flows for the with-project scenario. Diesel price is the most sensitive inputs for the project. Although the analysis used the current historically low price as a base price, the result still shows that the project is financially viable. The results indicate a financial internal rate of return of 7.51%, which is above the weighted average cost of capital of 2.29%; therefore, the project is deemed financially viable (footnote 25).

## **C. Sustainability**

23. The government provides two-way subsidies, through electricity tariffs and fuel costs, to reduce the cost of electricity for consumers. The energy subsidy remains a large burden on public expenditure and adds to Maldives' fiscal burden. Under the adverse impact of COVID-19, the government's financing needs are expected to increase, further weakening the fiscal position. The development of renewable energy is expected to improve the country's fiscal situation by reducing both the volume of fossil fuel imports as well as the fiscal uncertainty arising from fuel price volatility. In this context, harnessing renewable energy is more critical with the COVID-19 pandemic situation, as that will increase sustainability and financial health.

24. The power subsector in the Maldives has inherent constraints that hinder its financial sustainability. Most electricity is generated and distributed by two power utilities, STELCO and FENAKA, which operate diesel-based power stations in small and remote inhabited islands. They have been financially burdened by expensive fuel costs and resultant high operation and maintenance costs from inefficient diesel generators. However, their profitability has increased from 2017 to 2019, mainly because of continuous improvement in operational efficiency, in which the current project played a vital role. STELCO and FENAKA will continue to benefit from scaling up renewable energy with lower generation costs and improved energy efficiency measures.

<sup>27</sup> ADB. 2017. [Guidelines for the Economic Analysis of Projects](#). Manila.

<sup>28</sup> Economic and Financial Analysis (accessible from the list of linked documents in Appendix 2).

<sup>29</sup> ADB. 2005. [Guidelines on the Financial Management and Analysis of Projects](#). Manila.

## **D. Governance**

25. The pre-mitigation financial management risk associated with the project is assessed *substantial*. The project funds will be managed solely by the PMU in the MOE, which has reasonably strong financial management and reporting systems in place. However, the assessed risk is mainly because of weaknesses in financial management as well as the financial sustainability of STELCO and FENAKA, the implementing agencies and ultimate custodians of the assets created out of the project finances. The key risks identified for both STELCO and FENAKA include lack of appropriate fixed-asset record keeping and physical verifications, persistent unresolved audit observations, noncompliance with financial covenants included in the current project, lack of an enterprise resource planning (ERP) system at STELCO, and significant delays in finalizing audited financial statements at FENAKA. The MOF, MOE, STELCO, and FENAKA have agreed on a comprehensive financial management action plan to address the identified risks. Key mitigation measures include basing FENAKA fiscal year 2019 financial statements on recently concluded fixed-asset verifications and revaluations, fast-tracking STELCO fixed-asset verifications and revaluations, installing an ERP system at STELCO (currently in progress), and the MOF approving and implementing a financial restructuring plan.

26. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government.

## **E. Poverty, Social, and Gender**

27. Poverty reduction and social issues were reviewed for subprojects during the project preparatory technical assistance. The project will provide several direct benefits to communities: (i) renewable energy sources available on islands; (ii) sustainable energy and economic development; (iii) energy supply to homes and for productive energy use; (iv) livelihood development through poverty reduction and improvement in the quality of life; (v) capacity development opportunities for women's groups; and (vi) development of a gender-equality-responsive plan for outer island transition to renewable energy.

28. Gender equality issues and opportunities for mainstreaming were considered in the preparation of the project based on the due diligence carried out for the five sample islands. The additional financing is classified as effective gender equality mainstreaming. A gender action plan (GAP), which integrates indicators and targets in the project design and monitoring framework, has been prepared. The GAP has the following key outputs: (i) creating a household demand-side management program to improve energy efficiency, targeting female household consumers who will link up with and further develop FENAKA's community outreach program; (ii) creating an enabling environment for developing women's microenterprises; (iii) promoting women's employment and training during subproject construction and operation and maintenance of the electricity assets on the islands; (iv) training FENAKA and STELCO staff in gender-inclusive community outreach approaches; and (v) designing and implementing a gender equality mainstreamed management system. The island women's development committees will be mobilized for community outreach and awareness-raising activities. Social development specialist services in gender and development will continue to be utilized to support the utilities in implementing the GAP. The overall project will promote and advocate a socially inclusive, gender equitable, and nondiscriminatory work environment and practices. Practices will be consistent with core labor standards. The overall project will minimize the risk of HIV/AIDS through continued information dissemination campaigns in project areas. The MOE, through the PMU, will coordinate all gender-related activities through a gender focal point.

## F. Safeguards

29. In compliance with ADB's Safeguard Policy Statement, the project's safeguard categories are as follows.

30. **Environment (category C).** The additional financing is classified environment category C as the incremental activities are likely to have minimal or no adverse environmental impacts. There are four new indicators in the additional financing: ice-making machines, a renewable-energy-operated ferry, a disaster-resilient distribution system, and capacity building.<sup>30</sup> The ice-making machines are not plant scale but are small warehouse-type facilities and are expected to be installed at four locations along with solar photovoltaic systems. In a pilot test, the machines did not cause any environmental issues except minor vegetation clearing to locate them. The renewable-energy-operated ferry to be purchased is for local transportation of 30–40 passengers, and it does not need any ballast water management. The climate-change-resilient distribution system is the same as in the existing distribution intervention, but only adopting improved equipment in the system. Though the incremental risk is low, environmental due diligence during the implementation will cover these additional interventions as well as the existing ones in the original scope. The current project is classified category B and it has been implemented in accordance with the environmental assessment and review framework and ADB's Safeguard Policy Statement with submission of required initial environmental examinations and monitoring reports. A necessary covenant which cross-references the safeguards covenants of the original grant agreement is included in the grant agreement of the additional financing. The initial environmental examinations required by the environmental assessment and review framework of the current project will be continuously prepared for both existing and additional activities, and monitoring reports covering the implementation status of both the current project and the additional financing will also be provided semiannually.

31. **Involuntary resettlement (category C) and indigenous peoples (category C).** The additional financing is classified category C for involuntary resettlement and C for indigenous peoples. Due diligence conducted on sample subprojects showed no resettlement impacts and no adverse impacts on indigenous groups. The current project is classified category B for involuntary resettlement and category C for indigenous peoples. Due diligence finds the project to be in compliance with involuntary resettlement safeguards requirements. A resettlement framework has been prepared for the overall project. If any changes or additional land requirements or involuntary resettlement impacts emerge during implementation of a subproject, a resettlement plan will be prepared or modified according to the applicable laws referred to in the resettlement framework. ADB's approval will be obtained before implementation of the subproject continues. The social and environmental safeguards will be conducted by FENAKA and STELCO, assisted by the PMU.

## G. Summary of Risks and Mitigating Measures

32. Significant risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.<sup>31</sup>

<sup>30</sup> For solar photovoltaic–battery–diesel hybrid systems in an additional 12 outer islands under output 1, the intervention has been included in the original scope, but only locations are added. Thus, it is regarded as an existing activity.

<sup>31</sup> Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

**Table 4: Summary of Risks and Mitigating Measures**

<b>Risks</b>	<b>Mitigating Measures</b>
Extreme climate events such as excessive precipitation, cyclonic winds, storm surges, salt intrusion, and/or coastal flooding damage project assets during the construction and operation phases.	The design standards of renewable hybrid generation systems have been strengthened to withstand heavy rainfall, high wind speeds, and salt intrusion. The project assets are sited at locations to avoid any damage from coastal flooding. Project components such as disaster-resilient distribution networks and livelihoods using renewable energy to adapt to extreme weather and mobile substations to emergency supply have been incorporated in the contracts.
Under the adverse impact of COVID-19, reduced demand and delayed payment have led STELCO and FENAKA to face more significant cash shortfalls, and their liquidity position could worsen.	The government announced a recovery package including providing a subsidy of 40% on electricity bills for April–May 2020 and reduced the oil price to power utilities. In addition, STELCO and FENAKA have taken various measures to improve collection efficiency to reduce any cash shortfall and will further review options and adopt a plan to address and reduce outstanding accounts receivable to improve their liquidity positions.
Weak financial management and financial sustainability of STELCO and FENAKA.	Both STELCO and FENAKA have undertaken significant reform measures in improving financial management. These include completion of fixed-asset verifications and revaluations, installation of an ERP (for FENAKA), development of policies and procedures manuals, appropriate staffing, and improvements in internal audit functions. Further improvements are under way which are likely to result in improved financial management and fewer audit observations. Appropriate financial covenants are included in the legal agreements, and a comprehensive financial management action plan has been agreed to ensure implementation of agreed reform initiatives.

COVID-19 = coronavirus disease 2019, STELCO = State Electric Company Limited.

Source: Asian Development Bank.

#### **IV. ASSURANCES**

33. The government has assured ADB that implementation of the project shall conform to all applicable ADB requirements, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, financial management, and disbursement as described in detail in the PAM, and loan and grant documents.

34. The government has agreed with ADB on certain covenants for the project, which are set forth in the loan agreement and grant agreement.

#### **V. RECOMMENDATION**

35. I am satisfied that the proposed loan and grant would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve

- (i) the loan of SDR5,502,000 to the Republic of Maldives for the additional financing of the Preparing Outer Islands for Sustainable Energy Development Project, from ADB's ordinary capital resources, in concessional terms, with an interest charge at the rate of 1.0% per year during the grace period and 1.5% per year thereafter; for a term of 32 years, including a grace period of 8 years; and such other terms and conditions as are substantially in accordance with those set forth in the draft loan agreement presented to the Board; and

- (ii) the grant not exceeding \$2,730,000 to the Republic of Maldives from ADB's Special Funds resources (Asian Development Fund) for the additional financing of the Preparing Outer Islands for Sustainable Energy Development Project, on terms and conditions that are substantially in accordance with those set forth in the draft grant agreement presented to the Board.

Masatsugu Asakawa  
President

6 October 2020



## REVISED DESIGN AND MONITORING FRAMEWORK

Impact the Project is Aligned with			
More sustainable energy sector based on renewable resources (Strategic Action Plan 2019–2023) <sup>a</sup>			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
<b>Outcome</b> <b>Current project</b>  Shift towards clean and cost-effective energy sources	By <del>2019</del> <u>2024</u> :  a. Gradual reduction in diesel consumption to 0.1–0.3 liters/kWh on outer islands. (2012 baseline: 0.45–0.70 liters/kWh consumed on outer islands) (OP 3.1)  b. Electricity tariffs on average improve to cover closer to 100% of costs (2011 baseline: Present retail tariffs on average cover less than 50% of costs) (OP 6.1)  c. Carbon dioxide emissions reduced by <del>40,000</del> <u>44,501</u> tons in the power subsector. (2019 baseline forecast: Nil) (OP 3.1)	a.–c. MOE annual report and project monitoring reports	Tariffs and/or guarantees not adequate for private sector investor interest
<b>Outputs</b>  1. Renewable-energy-ready grid systems developed for outer islands and the Greater Malé region	By <del>2019</del> <u>2023</u> :  1a. <del>21</del> <u>24.5</u> MW of solar photovoltaic capacity installed by project and private sector, <del>7</del> <u>9.5</u> MWh of energy storage designed and installed, 20 MW of diesel generator sets replaced, and the distribution grids upgraded in 160 islands <sup>b</sup> (2018 baseline: 10.5 MW of solar photovoltaic, 5.0 MWh of energy storage, and 12.0 MW of diesel generator sets) (OP 3.1.4)  <u>1b. Solar-photovoltaic-based ice-making machines installed in four outer islands (2019 baseline: 0) (OP1.3.1, OP 2.1.4, OP 3.2.2, OP 5.1.1)</u>  <u>1c. Disaster-resilient distribution system installed in one island (2019 baseline: 0)</u>	1a.–d. FENAKA and STELCO annual reports or Progress report, MOE	Delays or changes in island selection by the government  Unexpected significant increase in price of raw materials and power plant components

Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting Mechanisms	Risks
	<p><u>1d. One renewable-energy-operated ferry for transport developed</u> (2019 baseline: 0) (OP 3.1.3)</p>		
2. Capacity of MOE, STELCO, and FENAKA to implement renewable energy grids enhanced	<p>2a. Road map for transition to renewable energy including procurement, project management, technical and financial management, and safeguard support <u>including the renewable energy pilots identified in road map</u> implemented (OP 6.1.1)</p> <p>2b. Up to <del>60</del> 80 FENAKA and STELCO staff (target includes at least 25% women) trained to implement the road map for renewable energy systems and to scale-up proven solutions (OP 6.1.1)</p> <p>2c. A gender-inclusive community outreach program implemented to raise awareness on renewable energy and household demand-side management, targeting island women's development committees and female household consumers in the outer islands covered under the project (at least 50% of participation in all community outreach activities are women) (OP 6.2.4)</p> <p>2d. At least two training and information sessions on reducing off-peak and/or shoulder rate tariffs for micro and small enterprises led by women conducted per project phase. (OP 6.2.4)</p>	<p>2a. MOE annual report</p> <p>2b.–d. FENAKA and STELCO annual reports or gender action plan monitoring reports</p>	Rapid turnover in PMU staff

## Key Activities with Milestones

### 1. Renewable-energy-ready grid systems developed for outer islands and the Greater Malé region

- 1.1 Issue bidding documents for phase 1, contract awards for grid and energy efficiency systems (30 June 2014–1 September 2015) (completed).
- 1.2 Commission phase 1, grid and energy efficiency systems (1 September 2015–1 February 2016) (completed).
- 1.3 Issue bidding documents for phase 1, contract awards for renewable energy systems (30 June 2014–1 September 2015) (completed).
- 1.4 Commission phase 1, renewable energy systems (1 September 2015–1 February 2016) (completed).
- 1.5 Issue bidding documents for phase 2, contract awards for energy efficiency project at Malé. (30 June 2015–1 March 2016) (completed).
- 1.6 Commission phase 2, energy efficiency project at Malé (1 May 2016–1 June 2017) (completed).
- 1.7 Issue bidding documents for phase 2 and award contracts for renewable energy project: grid-tied solar photovoltaic–diesel hybrid systems (1 March 2015–1 May 2016) (completed).
- 1.8 Commission phase 2 for renewable energy project: grid-tied solar photovoltaic–diesel hybrid systems (1 May 2016–~~4 November 2018~~ 1 October 2019) (completed).
- 1.9 Issue bidding documents for phase 3a and award contracts for renewable energy project: grid-tied solar photovoltaic–diesel hybrid systems (1 January 2016–1 March 2017) (completed).
- 1.10 Commission phase 3a (1 March 2017–~~1 September 2017~~ 31 December 2019) (completed).
- 1.11 Issue bidding documents for phase 4 and award contracts for grid systems (~~1 October 2016–1 December 2017~~ 1 June 2017–1 December 2018) (completed).
- 1.12 Commission phase 4 (~~1 December 2017–1 June 2018~~) by March 2019.<sup>c</sup>
- 1.13 Issue bidding documents for package 1, lots 1 and 2, contract awards for solar-battery hybrid renewable energy systems by June 2021.
- 1.14 Commission package 1 by March 2023.
- 1.15 Issue bidding documents for package 2, contract awards for climate-resilient distribution network system by August 2021.
- 1.16 Commission package 2 by June 2023.
- 1.17 Procure integrated renewable-energy-operated ferry by May 2023.

### 2. Capacity of MOE, STELCO, and FENAKA to implement renewable energy grids enhanced

- 2.1 Procure consulting services to support PMU, FENAKA, and STELCO on design, implementation, and project management (30 June 2014–1 March 2015) (completed).
- 2.2 Bid support for phase 1 (1 March 2015–1 September 2015) (completed).
- 2.3 Review selected design, prepare safeguards and other island-specific information for phase 2 (1 December 2014–31 March 2015) (completed).
- 2.4 Review selected design, prepare safeguards and other island-specific information for phase 3 (1 September 2015–31 December 2015) (completed).
- 2.5 Review selected design, prepare safeguards and other island-specific information for phase 4 (1 June 2016–30 September 2016) (completed).
- 2.6 Review implementation progress of the four phases periodically including implementation of road map (1 January 2015–~~31 December 2019~~ 31 March 2024).
- 2.7 Implement training program for capacity development for PMU, STELCO, and FENAKA (1 April 2015–~~31 December 2017~~ 31 March 2024).
- 2.8 Prepare quarterly progress reports and meet other reporting requirements (1 January 2015–~~31 December 2019~~ 31 March 2024).
- 2.9 Implement the gender action framework (31 March 2015–~~31 December 2019~~ 31 March 2024) (unchanged).
- 2.10 Recruit consultant to design climate and community-resilient project components (1 January 2021–30 April 2021).
- 2.11 Recruit asset valuation consultant for STELCO (1 January 2021–31 March 2021).
- 2.12 Recruit individual international consultants for design and implementation (1 March 2021–30 June 2021).

**Inputs****Grant**

ADB grant: ~~\$38.00 million~~ \$40.73 million (\$2.73 million additional financing)

ADB Strategic Climate Fund: \$12.00 million

**Loan**

Islamic Development Bank: ~~\$10.00 million~~

ADB concessional ordinary capital resources loan: (\$7.74 million additional financing)

European Investment Bank: \$50.00 million

Government of Maldives: ~~\$14.00 million~~ \$14.53 million (\$0.53 million additional financing)

ADB = Asian Development Bank, EIB = European Investment Bank, FENAKA = FENAKA Corporation Limited, kWh = kilowatt-hour, MOE = Ministry of Environment, MW = megawatt, MWh = megawatt-hour, OP = operational priority, PMU = project management unit, STELCO = State Electric Company Limited.

<sup>a</sup> Government of Maldives. 2019. *Strategic Action Plan 2019–2023*. Malé prioritizes the realistic strategic goals of the government.

<sup>b</sup> Output 1(a) includes installation of solar photovoltaic–battery–diesel hybrid systems with grid upgrades, an energy management system, and Supervisory Control and Data Acquisition (SCADA) system like the current project. Though the additional financing supports additional 12 islands, the total number of islands remains 160 due to withdrawal of Islamic Development Bank loan.

<sup>c</sup> The implementation of phase 4 is extended because of the delay in EIB loan effectiveness. The EIB loan was made effective only on 21 November 2019.

Source: ADB.

**LIST OF LINKED DOCUMENTS**

<http://www.adb.org/Documents/RRPs/?id=46122-005-3>

1. Loan Agreement
2. Grant Agreement
3. Sector Assessment (Summary): Energy
4. Project Administration Manual
5. Summary of Project Performance
6. Economic and Financial Analysis
7. Summary Poverty Reduction and Social Strategy
8. Risk Assessment and Risk Management Plan
9. Gender Action Plan
10. Resettlement Framework

**Supplementary Documents**

11. Contribution to Strategy 2030 Operational Priorities
12. Climate Change Assessment
13. Environmental Due Diligence Report
14. Financial Management Assessment
15. Financial Statement Analysis