



Report and Recommendation of the President to the Board of Directors

Project Number: 46122
September 2014

Proposed Grant and Administration of Grant Republic of the Maldives: Preparing Outer Islands for Sustainable Energy Development Project

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Asian Development Bank

CURRENCY EQUIVALENTS

(as of 15 August 2014)

Currency unit	–	rufiyaa (Rf)
Rf 1.00	=	\$0.065
\$1.00	=	Rf15.40

ABBREVIATIONS

ADB	–	Asian Development Bank
EIB	–	European Investment Bank
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
FENAKA	–	FENAKA Corporation Limited
GAF	–	gender action framework
IDB	–	Islamic Development Bank
MEA	–	Maldives Energy Authority
MEE	–	Ministry of Environment and Energy
MOFT	–	Ministry of Finance and Treasury
MW	–	megawatt
PAM	–	project administration manual
PMU	–	project management unit
SCF	–	Strategic Climate Fund
STELCO	–	State Electricity Company
TA	–	technical assistance

NOTE

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

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PROJECT AT A GLANCE

1. Basic Data		Project Number: 46122-003	
Project Name	Preparing Outer Islands for Sustainable Energy Development Project	Department /Division	SARD/SAEN
Country Borrower	Maldives	Executing Agency	Ministry of Finance and Treasury
2. Sector	Subsector(s)	ADB Financing (\$ million)	
✓ Energy	Conventional energy generation		12.00
	Energy efficiency and conservation		7.00
	Renewable energy generation - solar		19.00
		Total	38.00
3. Strategic Agenda	Subcomponents	Climate Change Information	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation (\$ million)	38.00
Environmentally sustainable growth (ESG)	Global and regional transboundary environmental concerns	CO ₂ reduction (tons per annum)	40,000
	Natural resources conservation	Climate Change impact on the Project	Medium
4. Drivers of Change	Components	Gender Equity and Mainstreaming	
Governance and capacity development (GCD)	Institutional development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions (KNS)	Organizational development		
Partnerships (PAR)	Application and use of new knowledge solutions in key operational areas		
Private sector development (PSD)	International finance institutions (IFI) Official cofinancing		
	Public sector goods and services essential for private sector development		
5. Poverty Targeting		Location Impact	
Project directly targets poverty	No	Nation-wide	High
6. Risk Categorization:	Low		
7. Safeguard Categorization	Environment: B Involuntary Resettlement: B Indigenous Peoples: C		
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		38.00	
Sovereign Grant projects: Asian Development Fund		38.00	
Cofinancing		72.00	
Strategic Climate Fund		12.00	
Islamic Development Bank		10.00	
European Investment Bank		50.00	
Counterpart		14.00	
Government		14.00	
Total		124.00	
9. Effective Development Cooperation			
Use of country procurement systems		No	
Use of country public financial management systems		No	

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on (i) a proposed grant and (ii) proposed administration of a grant to be provided by the Asian Development Bank (ADB) Strategic Climate Fund (SCF),¹ both to the Republic of the Maldives for the Preparing Outer Islands for Sustainable Energy Development Project.²

2. The project will replace inefficient diesel-based power generation grids on the islands with hybrid (renewable energy and diesel) systems and contribute to reductions in the cost of electricity, the subsidy burden on the government budget, and emissions.³

II. THE PROJECT

A. Rationale

3. The Maldives is an archipelago 750 kilometers southwest of Sri Lanka with 26 atolls⁴ and a total land area of about 300 square kilometers. About half the country's population lives on the outer islands⁵. The Maldives has about 141 megawatts (MW) of installed diesel-based generation capacity on the inhabited islands and another 105 MW on the resort islands. While the Maldives has the unique distinction of being the first and only country in South Asia with 100% access to electricity, this achievement has come at a cost. Given the geographic spread, each island is electrified with its own diesel-powered grid system, resulting in expensive and not very reliable supply. The cost of diesel power is unaffordable at 30 cents–70 cents per kilowatt-hour (depending on the island) and requires government subsidies in excess of \$40 million annually. Electricity-related subsidies are also a focus area for more robust management of government expenditures. In 2012, the Maldives spent over \$470 million on oil imports, a large share of it being fuel for electricity generation.⁶ The 100% diesel dependence of the Maldives also makes its carbon emissions per unit of electricity among the highest in the region. The State Electricity Company (STELCO) and FENAKA Corporation Limited (FENAKA) are the main electricity utilities responsible for supplying electricity to the communities of inhabited islands, except a few where island councils are still responsible for electricity supply.

4. The Maldives has significant renewable energy resources, i.e., the potential to generate solar power and, in some pockets, wind power. Energy sector studies show that the cost of energy generation from hybrid (renewable energy and fossil fuel) systems would be significantly lower than the existing options. The transition to renewable energy has a sound economic rationale. The government's effort to increase electricity production from indigenous sources, including solar and wind, to enhance energy security will reduce the pressure on the balance of payments and improve the fiscal position. The government has initiated two programs—Preparing Outer Islands for Sustainable Energy Development (POISED) and Accelerating Sustainable Private Investments in Renewable Energy (ASPIRE) to support energy efficiency and renewable energy investments.

¹ Under the Scaling Up Renewable Energy Program in Low-Income Countries financed by the Strategic Climate Fund.

² ADB provided project preparatory technical assistance (TA) for Preparing the Outer Islands for Sustainable Energy Development Project (TA 8268-MLD).

³ The design and monitoring framework is in Appendix 1.

⁴ The Maldives has 1,192 islands, of which about 194 islands are inhabited.

⁵ Outer Islands are the islands in the atolls outside the greater Male region.

⁶ The Maldives is considered one of the country's most vulnerable to oil price fluctuations, with oil imports close to 35% of gross domestic product in 2012.

5. The proposed project on the outer islands would transform the existing grids through physical investments in renewable energy, energy management and control systems, energy storage, and improvements in distribution networks, and significantly reduce the need for diesel to generate electricity. Private sector investments to support solar photovoltaic interventions on larger islands (initially planned for STELCO) are under consideration outside, and complementary to, the project. In addition, the government is expected to support a low carbon energy pathway in the private tourist islands over the medium term through policy measures and investment interventions supported by ADB's Private Sector Operations Department and the SCF. ADB will also support the utilities' demand-side management interventions through future technical assistance (TA).

6. The government has a national energy policy to support the development of the energy sector. ADB policy dialogue has been supporting development of the energy sector including the development of a medium term road map and investment plan. The capacity of institutions such as the Maldives Energy Authority (MEA), the Ministry of Environment and Energy (MEE), and the utilities is also progressively being strengthened⁷ to enable implementation. This includes MEA developing and issuing regulations to approve investment plans, operator licensing and consumer tariffs and implementing them by June 2015. Also MEA will approve a grid code to ensure successful operation of the facilities installed under the project. The governance of STELCO and FENAKA will also be improved with measures including the appointment of independent directors with technical, legal and financial expertise. The project is aligned with ADB's Midterm Review of Strategy 2020 of supporting sustainable energy growth, its Energy Policy, and its country operations business plan for the Maldives for 2013–2015.⁸ Based on the government's investment plan for the outer islands and the characteristics of the electricity systems, a sector project approach is considered best suited to support the transition of those islands that meet the eligibility criteria, as defined in the project administration manual (PAM).⁹

7. **Lessons learned from ongoing projects.** ADB's operations in the energy sector since 1985 were instrumental in meeting electricity demand in the capital of Malé and for building capacity in STELCO. From 2002, ADB supported the outer islands electrification project, which provided diesel generators and grid investments on 19 islands.¹⁰ Several lessons from earlier operations suggest the need for (i) ADB's collaboration with other development partners to leverage existing resources; (ii) detailed technical, economic, and financial appraisal of projects prior to approval; (iii) technical support to strengthen institutions such as MEA. The project design incorporates these lessons. Since the project uses a sector approach, detailed design has been carried out for a sample of five islands representing all the inhabited islands. This sample will be the first to be implemented. Parallel cofinancing has been sought from multiple partners, and the integration of outer islands into the jurisdiction of one agency will facilitate procurement as well as standard practices for financial management. Since 2012, ADB has been supporting the MEA in preparing technical codes and standards as well as regulations for the electricity sector, including renewable energy investments. A consulting firm will support the project management unit (PMU) in screening, doing surveys, preparing bidding documents,

⁷ ADB. 2011. *Technical Assistance to the Republic of the Maldives for Capacity Building of the Maldives Energy Authority*. Manila (TA 8000-MLD).

⁸ ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila; ADB. 2009. *Energy Policy*. Manila; and ADB. 2012. *Country Operations Business Plan: Maldives, 2013–2015*. Manila.

⁹ Project Administration Manual (accessible from the list of linked documents in Appendix 2).

¹⁰ ADB. 2013. *Validation Report for Maldives: Outer Islands Electrification (Sector) Project*. Manila.

selecting contractors, and overseeing construction activities. The implementation and disbursement schedules are realistic and take into account difficulties met in previous project implementation in the Maldives.

8. **Coordination with other donors.** The project has evolved from a smaller project planned under a medium-term investment plan prepared by the Maldives in 2012. Since then, several donors such as the Islamic Development Bank (IDB), the European Investment Bank (EIB), and other bilateral agencies have expressed interest in cofinancing the project alongside ADB. The project components are complementary to operations of the World Bank Group¹¹ planned for 2014 and 2015, and a proposed pilot project planned in Addu City through the new fund for Joint Crediting Mechanism of the Government of Japan.¹² The investments in the distribution grid, control systems, diesel generators, and energy storage devices financed under the project by ADB and its partners would facilitate more efficient operation and enable the utilities to achieve the proposed fuel-saving targets.

B. Impact and Outcome

9. The impact of the project will be a more sustainable energy sector based on renewable resources, to be achieved by 2022. The outcome will be a shift towards clean and cost-effective energy sources by 2019.¹³

C. Outputs

10. The project has two outputs: (i) renewable-energy-ready grid systems developed for outer islands and greater Male region; and (ii) enhanced capacity of MEE, STELCO, and FENAKA to implement renewable energy grid interventions.

11. Output 1 includes the design and installation of equipment for solar–diesel hybrid grids on about 160 islands. It will begin in the second half of 2014 with investments in five sample subprojects and a control center, to be scaled up to other islands according to eligibility criteria. Capacity building under output 2 covers roadmap implementation including procurement, project management, technical and financial management, gender and safeguard support, and training; this will start in 2014 and last for the duration of the project.

D. Investment and Financing Plans

12. The project is estimated to cost \$124 million (Table 1). Detailed cost estimates by expenditure category and by financier are in the PAM (footnote 9).

¹¹ The World Bank is supporting the initial phase of a private sector solar photovoltaic investment on four islands in Greater Malé and designing a partial risk guarantee product for private sector investment in renewable energy.

¹² ADB. 2014. *Establishment of the Japan Fund for Joint Crediting Mechanism*. Manila. This is a new trust fund to support deployment of advanced low-carbon technologies.

¹³ Diesel reduction will be achieved by replacing inefficient diesel generators, upgrading distribution systems, and gradually replacing diesel generation with renewable energy and storage solutions.

Table 1: Project Investment Plan
(\$ million)

Item	Amount ^a
A. Base Cost ^b	
1. Renewable-energy-ready grid systems developed for islands	106.6
2. Capacity of the Ministry of Environment and Energy, State Electricity Company, and FENAKA Corporation Limited to implement renewable energy grids strengthened	3.6
Subtotal (A)	110.2
B. Contingencies ^c	12.0
C. Financing Charges During Construction	1.8
Total (A+B+C)	124.0

^a Renewable energy projects are exempted from import duties. Any taxes or duties, if applicable, would be financed from government sources.

^b In mid-2014 prices.

^c Physical contingencies computed at 5% for equipment and materials. Price contingencies computed at 1.4% on foreign exchange costs and 4.5% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

Source: Asian Development Bank estimates.

13. The Government of the Maldives has requested a grant¹⁴ not exceeding \$38.0 million from ADB's Special Funds resources to help finance part of output 1 and output 2 of the project. The financing plan is in Table 2. The ADB SCF¹⁵ will provide grant cofinancing equivalent to \$12 million, to be administered by ADB. The government will provide these funds to STELCO and FENAKA on terms and conditions acceptable to ADB. IDB¹⁶ and EIB¹⁷ have expressed interest in cofinancing the project on a parallel basis.¹⁸ IDB is expected to provide a loan in the amount of \$10 million, for a period of 20 years with an administrative charge not exceeding 2% during project implementation. EIB is expected to provide a loan in the amount of \$50 million for 15 years at an interest rate of 61 basis points over the London interbank offered rate. IDB and EIB loans will be onlent by the government to STELCO and FENAKA on terms and conditions acceptable to these agencies for investments in the islands. The government will provide \$14 million of counterpart financing to procure and install efficient diesel generation sets and distribution networks as well as cover applicable taxes and duties.

¹⁴ A country's eligibility for Asian Development Fund (ADF) grants under the revised grant framework is determined by its risk of debt distress. The latest debt sustainability analysis determined that the Maldives has a high risk of debt distress and is therefore eligible to receive 100% of its ADF allocation as grants.

¹⁵ Under the Scaling Up Renewable Energy Program in Low-Income Countries financed by the Strategic Climate Fund. Administered by ADB. In 2012, the SCF endorsed the investment plan submitted by the Government of the Maldives requesting a \$12.0 million grant to be administered by ADB for the project. The project preparatory TA received \$0.7 million of grant financing in 2012 from the SCF to develop the components. In accordance with established Climate Investment Fund procedures, SCF approval for the project was received in July 2014 after ADB's staff review meeting on the project.

¹⁶ In 2012, IDB and ADB signed minutes of meetings to work together to support a renewable energy sector project in the Maldives. This was further discussed in 2014 during the IDB country programming mission to Maldives.

¹⁷ In 2013, EIB indicated interest in cofinancing the project and channeling the funds through the Bank of Maldives. A communication in this regard was sent from EIB to the Ministry of Finance and Treasury in the Maldives.

¹⁸ On 7 May 2014, the Cabinet of the Republic of the Maldives expressed interest in receiving loans from EIB and IDB for the project. This will enable processing of these loans. The Parliament of the Maldives will need to give final approval to any borrowings.

Table 2: Financing Plan

Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank (ADB)	38.00	31.0
ADB Strategic Climate Fund ^a	12.00	10.0
Islamic Development Bank ^b	10.00	8.0
European Investment Bank ^c	50.00	40.0
Government of the Maldives	14.00	11.0
Total	124.00	100.0

^a Under the Scaling Up Renewable Energy Program for Low-Income Countries financed by the Strategic Climate Fund. Administered by the Asian Development Bank.

^b Parallel financing for future subprojects starting in 2015.

^c Financing expected to be routed through the Bank of Maldives to subprojects starting in 2015.

Source: Asian Development Bank's fact-finding mission in April 2014 and staff review meeting in May 2014.

E. Implementation Arrangements

14. The Ministry of Finance and Treasury (MOFT) will be the executing agency. A PMU comprising officials from MEE, FENAKA, and STELCO has been set up to coordinate project activities. MEE, FENAKA, and STELCO will be the key implementing agencies. Project agreements will be entered into with FENAKA and STELCO. The PMU will be strengthened with external experts in the areas of finance, technology, and contract management. The PMU will be responsible for organizing training programs to build the institutional capacity of FENAKA and STELCO and will be responsible for monitoring the implementation. The project departments of FENAKA and STELCO, headed by project directors, will act as the project implementation units (PIUs) with adequate staff to assist in preparing and implementing the overall implementation plan, bid management, and budgeting. The project implementation units will also be responsible for overall intra-agency coordination. PIUs will provide project implementation support to contractors and will liaise with the islands where the project will be implemented.

15. The project will be implemented in four phases. Feasibility studies of five sample subprojects for the islands of S. Addu, B. Goidhoo, Th. Buruni, Ga. Vilingili, and Lh. Khurendhoo have been completed. These will be the first subprojects for which procurement and implementation will start in late 2014 (under phase 1). The PMU team has been established in 2014 and functional experts in technical, financial management, procurement, social and environmental safeguards will also be identified to support the PMU for the review of the design and the implementation of the solar–diesel hybrid grids on the five islands. Implementation of subprojects under subsequent phases will involve replacement of diesel generator sets and grids, as well as installation of solar photovoltaic and energy storage equipment, and would be done atoll by atoll based on the proposed eligibility and selection criteria. Bid document preparation for phase 2 will start in 2015, for phase 3 in 2016, and for phase 4 in 2017. An atoll-by-atoll approach is preferred for future subprojects as it allows better planning and implementation efficiencies (footnote 10). ADB's Procurement Guidelines (2013, as amended from time to time) would be followed for procurement of ADB-financed and ADB-administered subprojects.¹⁹ The implementation arrangements are summarized in Table 3 and described in detail in the PAM (footnote 9).

16. The World Bank supported ASPIRE program will provide partial risk guarantees to private sector investors in solar photovoltaic systems in the Maldives and is expected to be rolled out in 2015 starting with the area serviced by STELCO. In addition, the World Bank is also

¹⁹ On 18 March 2013, the ADB Board of Directors approved a blanket waiver of member country procurement eligibility restrictions in cofinanced ADF operations.

designing a project to support solar photovoltaic installations in the Greater Malé region serviced by STELCO. The readiness of the existing grid on STELCO islands may need to be enhanced to successfully integrate solar energy and reduce diesel consumption and required coordination with the World Bank project program would be taken up by the PMU. Further, ongoing capacity development TA to MEE and MEA (footnote 7) to support the formulation of key regulations, facilitate private sector investment, and meet key sector objectives will continue with support from the SCF.²⁰

Table 3: Implementation Arrangements

Aspects	Arrangements		
Implementation period	June 2014–December 2019		
Estimated completion date	31 December 2019		
Management			
(i) Oversight body	Project steering committee comprising state ministers (finance and treasury, environment and energy, economic development) of the Government of the Maldives, Head of Maldives Energy Authority; and Managing Directors of FENAKA and STELCO		
(ii) Executing agency	Ministry of Finance and Treasury, Government of the Maldives		
(iii) Key implementing agencies	MEE, FENAKA, and STELCO		
(iv) Implementation unit	Project management unit located at MEE, seven staff proposed; project implementation units at STELCO and FENAKA		
Procurement	International competitive bidding	Six contracts (under ADB) EIB and IDB to follow own procurement guidelines	\$44 million
	National competitive bidding	none	
Consulting services	QCBS	Firm-based contract	\$3 million
Retroactive financing and/or advance contracting	Retroactive financing to be requested for eligible expenditure on equipment, civil works, and implementation services, not exceeding the amount of 20% of the estimates, incurred before grant effectiveness but not earlier than 12 months before the signing of the grant agreement. Advance contracting was approved in July 2014		
Disbursement	The grant proceeds will be disbursed in accordance with ADB's <i>Loan Disbursement Handbook</i> (2012, as amended from time to time) and detailed arrangements agreed upon between the government and ADB.		

ADB = Asian Development Bank, EIB = European Investment Bank, FENAKA = FENAKA Corporation Limited, IDB = Islamic Development Bank, MEE = Ministry of Environment and Energy, QCBS = quality- and cost-based selection, STELCO = State Electricity Company.

Source: Asian Development Bank estimates.

17. The PMU staff will be responsible for screening and due diligence on whether proposed subprojects meet the eligibility criteria for the project and will report to ADB. The government has been advised that ADB's approval of advance contracting and retroactive financing in principle does not commit ADB to finance the project.

²⁰ The SCF approved about \$0.4 million in 2014 to support MEE and MEA in periodic updates of the sector road map and investment plan, environmental management guidelines, private sector investment support, and productive energy end use.

III. DUE DILIGENCE

18. The project is considered viable based on due diligence and an assessment of the costs, benefits, and impacts. It will benefit the islands of the Maldives with the availability of cheaper, cleaner, and more reliable power. It also will reduce the subsidy burden on the government and allow more financing of key social priorities. The main benefit to the country's economy will be accrued in the form of reduced diesel imports, which will have a significant positive impact on the country's balance of payments.

A. Technical

19. The government has a national energy policy and a sector road map to convert islands' electricity grids to hybrid (renewable energy and diesel) systems. Islands are classified based on the existing cost of electricity and economic level of renewable energy penetration. Detailed studies were conducted for a representative sample of islands using an energy planning model that optimizes the use of different energy sources for electricity generation, including renewable energy such as wind and solar power.²¹ Also, the analysis has been extrapolated to cover the entire group of inhabited islands in the Maldives. An investment plan has been developed for islands covered by FENAKA and for some of those covered by STELCO that could have interventions under the project. The road map is viable, and technologies have been selected based on operational requirements, local conditions, and capacity for operation and maintenance on remote islands. The procurement and implementation experience from the project's first set of islands in 2015 will provide useful information for the structuring of future procurement.

B. Economic and Financial

20. The project has been analyzed for economic viability using a with- and without-project approach in accordance with ADB's Guidelines for the Economic Analysis of Projects.²² The project is economically viable with benefits outweighing the costs. The economic internal rates of return (EIRRs) of the five sample subprojects range from 14.00% to 40.17%, while the benefit–cost ratios range from 1.06 to 1.40. The combined sample has an EIRR of 31.32%. Sensitivity analysis shows that the project returns are robust against changes in critical variables, with a minimum EIRR of 11.5% in the worst-case scenario of 20% escalation in capital costs.²³ The project components will support reduced diesel consumption per unit of electricity sold by replacing diesel generation sets and grids on nearly 160 islands and generating 21 MW of solar power. The project will support a reduction of 40,000 tons of carbon dioxide by 2019 against the baseline emissions in the energy sector.

21. Financial analysis of the project was carried out in accordance with ADB's Financial Management and Analysis of Projects.²⁴ All financial costs and benefits are expressed in constant 2014 prices. The weighted average cost of capital was estimated at 1.2% (in after-tax real terms). Based on conservative assumptions adopted for the base-case analysis—a 1.39%

²¹ HOMER, originally designed at the National Renewable Energy Laboratory in the United States, is a computer model that simplifies the task of designing microgrids that combine traditionally generated power, renewable power, energy storage and load management. Its optimization algorithm allows evaluation of the economic and technical feasibility of a large number of technology options and to account for variations in technology costs and energy resource availability.

²² ADB. 1997. *Guidelines for the Economic Analysis of Projects*. Manila.

²³ Economic Analysis (accessible from the list of linked documents in Appendix 2).

²⁴ ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

increase in diesel costs²⁵ and a periodic increase in fuel surcharges to reflect the fuel cost increases—the financial internal rate of return for the sample projects exceeds the weighted average cost of capital for all sample subprojects and ranges from 4.9% to 11.7%. Sensitivity analysis shows that the project returns are robust against changes in critical variables and exceed the WACC.

C. Governance

22. Financial management, procurement, anticorruption, policy and legal, capacity, and other institutional issues and mechanisms were assessed during the project preparatory TA. The PMU will report to an interministerial technical steering committee comprising the state ministers of finance and treasury, environment and energy, and economic development. The financial management risk is rated high, and a road map for the rollout of the project—including investment planning, institutional development, governance, and financial management—has been agreed with the government. ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government, STELCO, and FENAKA. The specific policy requirements and supplementary measures are described in the PAM (footnote 9).

D. Poverty and Social

23. Poverty reduction and social issues were reviewed for subprojects during the project preparatory TA. The project will ensure several direct benefits to communities: (i) use of 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, and (v) capacity development opportunities for women groups.

E. Gender Development

24. Gender issues and opportunities for mainstreaming were also considered in the preparation of the project based on the due diligence carried out for the five sample islands. The project is designed to be classified as effective gender mainstreaming. A gender action framework (GAF), which integrates indicators and targets in the project design and monitoring framework, has been prepared. The GAF has the following key outputs: (i) household demand-side management program to improve energy efficiency, targeting women household consumers who will link up with and further develop FENAKA's community outreach program; (ii) creation of an enabling environment for developing women's microenterprises; (iii) promotion of women's employment and training during subproject construction, and operation and maintenance of the electricity assets on the islands; (iv) training for FENAKA and STELCO staff in gender-inclusive community outreach approaches; and (v) a gender-mainstreamed management system to be designed and implemented. 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 be recruited to support the utilities in implementing the GAF. The 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 project will minimize the risk of HIV/AIDS through information dissemination campaigns in project areas. MEE, through the PMU, will determine a gender focal point to coordinate all gender-related activities.

²⁵ World Energy Outlook current scenario.

F. Safeguards

25. **Environment.** The project is classified as environment category B. An environmental assessment and review framework, and an initial environmental examination with an environmental management plan (EMP) for the sample subprojects were prepared according to ADB's Safeguard Policy Statement (2009) and in line with OM/F1,²⁶ the government's environmental impact assessment guidelines, and related national policies and legislation. The activities proposed under the project will result in limited environmental impacts, restricted mostly to construction and operation. Adequate mitigation measures have been incorporated into the EMP. Public consultation and information disclosure requirements have been met. Measures for the executing agency's and the implementing agencies' capacity enhancement for implementation of the EMP are also included in the initial environmental examination. The solar photovoltaic systems financed by the project will be mounted on structures of 3 meter–4 meter height, and other project facilities are expected to be resilient to climate change through compact and preassembled systems resistant to extreme weather conditions.

26. **Involuntary resettlement and indigenous peoples.** The project is classified as category B 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. A resettlement framework has been prepared for the 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. Risks and Mitigating Measures

27. The overall benefits of the project and its positive impact on the country's development efforts including the contribution to climate change mitigation are expected to outweigh the investment costs. The project has incorporated measures to overcome all the major risks during project implementation. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.²⁷

Table 4: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
More than expected increase in electricity demand could offset the diesel savings achieved through renewable energy	Demand-side energy-efficiency measures to be supported, such as through ongoing sources of bilateral funding. The proposed solutions are modular and scalable to meet increased demand.
FENAKA's financial management and governance are not strong	Utility accounts have been finalized for FENAKA and a roadmap agreed on including audits financial restructuring and periodic tariff resets. Covenants on financial management and governance have been included including a steering committee comprising state ministers to guide the PMU. External expertise in financial management and procurement to be provided to the PMU.
Implementation delays could result in time and cost overruns	Implementation is planned atoll by atoll. Adequate contingencies are provided and advance procurement is being initiated. Strong project management unit support and timely guidance from the

²⁶ ADB. 2013. Safeguard Policy Statement (Date of Issue: 1 Oct 2013). *Operations Manual*. OM F1/BP. Manila.

²⁷ Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigating Measures
	interministerial technical steering committee will support the project.
Lack or limited interest in private sector participation in renewable energy generation on the islands	Phased approach to private sector participation on the islands, starting with public sector investments supported by the Asian Development Bank in 2014 and followed by possible private investments supported by the planned World Bank guarantee in 2015. The sector project approach is flexible, and periodic reviews will assess implementation and the need for course corrections.
Rapid turnover in project management unit staff	The PMU will be supported by a specialist team over the implementation period.
Risks related to climate change	The project will provide solar photovoltaic systems, which will be mounted on structures of 3 meter–4 meter height. Other project facilities will have resilience to climate change through compact and preassembled systems resistant to extreme weather conditions. The project will not be affected by sea level rise.

FENAKA = Fenaka Corporation Limited, PMU = project management unit
Source: Asian Development Bank.

IV. ASSURANCES AND CONDITIONS

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

29. The government, MOFT, MEE, STELCO, and FENAKA have agreed with ADB on certain covenants for the project, set forth in the grant agreement and project agreement.

V. RECOMMENDATION

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

- (i) the grant not exceeding \$38,000,000 to the Republic of the Maldives from ADB's Special Funds resources, for 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 and project agreements presented to the Board; and
- (ii) the administration by ADB of a grant not exceeding the equivalent of \$12,000,000 to the Republic of the Maldives for the Preparing Outer Islands for Sustainable Energy Development Project to be provided by the ADB Strategic Climate Fund.

Takehiko Nakao
President

8 September 2014

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>Impact More sustainable energy sector based on renewable resources.</p>	<p>By 2022: Increase contribution of renewable energy in the supply mix of the Maldives to 25% (2009 baseline: less than 1%)</p> <p>All islands initiate electricity sector decarbonization and the reduction of CO₂ emissions to 0.6 kg of CO₂/kWh (2009 baseline: 0.9 kg of CO₂/kWh).^a</p>	<p>Ministry of Energy and Environment annual report</p> <p>Ministry of Energy and Environment annual report</p>	<p>Assumption The project can be replicated on other islands (including resort islands) on a commercial basis, based on trends in renewable energy costs.</p> <p>Risks Sudden unexpected changes to world oil prices</p> <p>Electricity demand growing beyond forecast, leading to increased diesel-based generation beyond expected levels</p>
<p>Outcome Shift towards clean and cost-effective energy sources</p>	<p>By 2019: 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)</p> <p>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)^b</p> <p>CO₂ emissions reduced by 40,000 tons in the power sector (2019 baseline forecast: 400,000 tons)</p>	<p>Ministry of Energy and Environment annual report</p> <p>Maldives Energy Authority annual report</p> <p>Ministry of Energy and Environment annual report</p>	<p>Assumptions Private sector partial risk guarantee from the World Bank introduced in a timely manner to facilitate private renewable energy investments in the islands</p> <p>Electricity grid and diesel generator sets with necessary control systems prepared adequately to facilitate timely private sector investment in solar photovoltaic systems</p> <p>Risk Tariffs, guarantees not adequate for private sector investor interest</p>
<p>Outputs Renewable-energy-ready grid systems developed for outer islands and greater Male region.</p>	<p>By 2019: 21 MW of solar photovoltaic, 7 MWh of energy storage designed and installed; 20 MW of diesel generator sets</p>	<p>FENAKA and STELCO annual reports</p>	<p>Assumption Cofinancing from the Islamic Development Bank and the European Investment Bank approved in time</p>

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p>Enhanced capacity of MEE, STELCO, and FENAKA to implement renewable energy grid interventions</p>	<p>replaced; and the distribution grids upgraded in 160 islands</p> <p>By 2019:</p> <p>Road map for transition to renewable energy including procurement, project management, technical and financial management and safeguard support implemented</p> <p>Up to 60 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</p> <p>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 women household consumers in the outer islands covered under the project</p> <p>Target: at least 50% of participation in all community outreach activities are women</p> <p>Reduced off-peak and/or shoulder rate tariffs provided for women-led micro- and small enterprises</p>	<p>MEE annual report</p> <p>FENAKA and STELCO annual reports</p> <p>FENAKA and STELCO annual reports</p> <p>FENAKA and STELCO annual reports</p>	<p>Risks</p> <p>Delays or changes in island selection by the government</p> <p>Unexpectedly significant increase in price of raw materials and power plant components</p> <p>Assumptions</p> <p>Timely nomination of staff for capacity-building activities in FENAKA, STELCO, and PMU</p> <p>Selection criteria for islands under the project are well designed and factor in community support for such investments</p> <p>Risk</p> <p>Rapid turnover in PMU staff</p>

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	Target: At least two training and information sessions per project phase		
<p>Activities with Milestones</p> <p>1. Renewable-energy-ready grid systems developed for islands</p> <p>1.1 Issue bidding documents for phase 1, contract awards for grid systems (30 Jun 2014–1 Sep 2015)</p> <p>1.2 Commission phase 1 (1 Sept 2015–1 Feb 2016)</p> <p>1.3 Issue bidding documents for phase 2 and award contracts for grid systems (1 Mar 2015–1 May 2016)</p> <p>1.4 Commission phase 2 (1 May 2016–1 Nov 2016)</p> <p>1.5 Issue bidding documents for phase 3 and award contracts for grid systems (1 Jan 2016–1 Mar 2017)</p> <p>1.6 Commission phase 3 (1 Mar 2017–1 Sep 2017)</p> <p>1.7 Issue bidding documents for phase 4 and award contracts for grid systems (1 Oct 2016 –1 Dec 2017)</p> <p>1.8 Commission phase 4 (1 Dec 2017 –1 Jun 2018)</p> <p>2. Capacity of MEE, STELCO, and FENAKA to implement renewable energy grids strengthened</p> <p>2.1 Procure consulting services to support PMU, FENAKA, and STELCO on design, implementation, and project management (30 Jun 2014–1 Mar 2015)</p> <p>2.2 Bid support for phase 1 (1 Mar 2015 –1 Sep 2015)</p> <p>2.3 Review selected design, prepare safeguards and other island-specific information for phase 2 (1 Dec 2014 –31 Mar 2015)</p> <p>2.4 Review selected design, prepare safeguards and other island-specific information for phase 3 (1 Sep 2015–31 Dec 2015)</p> <p>2.5 Review selected design, prepare safeguards and other island-specific information for phase 4 (1 Jun 2016 –30 Sep 2016)</p> <p>2.6 Review implementation progress of the four phases periodically including implementation of road map (1 Jan 2015–31 Dec 2019)</p> <p>2.7 Implement training program for capacity development for PMU, STELCO, and FENAKA (1 Apr 2015–31 Dec 2017)</p> <p>2.8 Prepare quarterly progress reports and meet other reporting requirements (1 Jan 2015–31 Dec 2019)</p> <p>2.9 Implement the gender action framework (31 Mar 2015–31 Dec 2019)</p>		<p>Inputs</p> <p>Grant</p> <p>ADB: \$38.0 million</p> <p>ADB Strategic Climate Fund: \$12.0 million</p> <p>Loan</p> <p>Islamic Development Bank: \$10.0 million</p> <p>European Investment Bank: \$50.0 million</p> <p>Government: \$14.0 million</p>	

ADB = Asian Development Bank, CO₂ = carbon dioxide, FENAKA = FENAKA Corporation Limited, kg = kilogram, kWh = kilowatt-hour, MEE = Ministry of Environment and Energy, MW = megawatt, MWh = megawatt-hour, PMU = project management unit, STELCO = State Electricity Company.

^a Through energy efficiency and renewable energy.

^b Tariffs are about 45% of cost coverage for domestic consumers (Scaling Up Renewable Energy Project Investment Plan, 2012).

Source: Asian Development Bank fact-finding mission (March 2014).

LIST OF LINKED DOCUMENTS

<http://adb.org/Documents/RRPs/?id=46122-003-2>

1. Grant Agreements
2. Project Agreements
3. Sector Assessment (Summary): Energy
4. Project Administration Manual
5. Contribution to the ADB Results Framework
6. Development Coordination
7. Financial Analysis
8. Economic Analysis
9. Country Economic Indicators
10. Summary Poverty Reduction and Social Strategy
11. Gender Action Plan
12. Initial Environmental Examination
13. Environmental Assessment and Review Framework
14. Resettlement Framework
15. Risk Assessment and Risk Management Plan

Supplementary Documents

16. Due Diligence Reports of Sample Islands: Summary
17. Financial Projections and Debt Sustainability Analysis