



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

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Project Number: 46122  
May 2014

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

Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 30 April 2014)

Currency unit	–	Rufiyaa (Rf)
Rf .00	=	\$ 0.0649
\$1.00	=	Rf 15.41

## ABBREVIATIONS

ADB	–	Asian Development Bank
EIRR	–	economic internal rate of return
FIRR	–	financial internal rate of return
IsDB	–	Islamic Development Bank
MEE	–	Ministry of Environment and Energy
MOFT	–	Ministry of Finance and Treasury
MW	–	Megawatt
PIU	–	project implementation unit
PMU	–	project management unit
POISED	–	Preparing Outer Islands for Sustainable Energy Development
PPA	–	power purchase agreement
SCF	–	Strategic Climate Fund
SREP	–	Scaling Up Renewable Energy Project
STELCO	–	State Electricity Company

## NOTE

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

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## PROJECT AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number: 45122-003</b>	
<b>Project Name</b>	Outer Islands for Sustainable Energy Development	<b>Department /Division</b>	SARD/SAEN
<b>Country</b>	Maldives	<b>Executing Agency</b>	Ministry of Finance and Treasury
<b>Borrower</b>	Maldives		
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>ADB Financing (\$ million)</b>	
✓ Energy	Conventional energy generation		12.00
	Energy efficiency and conservation		7.00
	Renewable energy generation - solar		19.00
		<b>Total</b>	<b>38.00</b>
<b>3. Strategic Agenda</b>	<b>Subcomponents</b>	<b>Climate Change Information</b>	
Inclusive economic growth	Pillar 1: Economic opportunities, including jobs, created and expanded Global and regional transboundary environmental concerns Natural resources conservation	Mitigation (\$ million)	30.00
Environmentally sustainable growth		CO <sub>2</sub> reduction (tons per annum)	40,000
		Climate Change Impact on the Project	Medium
<b>4. Drivers of Change</b>	<b>Components</b>	<b>Gender Equity and Mainstreaming</b>	
Governance and capacity development	Institutional development	Effective gender mainstreaming (EGM)	✓
Knowledge solutions	Organizational development		
	Application and use of new knowledge solutions in key operational areas		
Partnerships	International finance Institutions (IFI)		
Private sector development	Official cofinancing		
	Public sector goods and services essential for private sector development		
<b>5. Poverty Targeting</b>		<b>Location Impact</b>	
Project directly targets poverty	No	Nation-wide	High
<b>6. Risk Categorization:</b>	Low		
<b>7. Safeguard Categorization</b>	Environment: B Involuntary Resettlement: B Indigenous Peoples: C		
<b>8. Financing</b>			
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>	
<b>ADB</b>		<b>38.00</b>	
Sovereign Grant: Asian Development Fund		38.00	
<b>Cofinancing</b>		<b>62.00</b>	
Islamic Development Bank		10.00	
European Investment Bank		40.00	
Strategic Climate Fund		12.00	
<b>Counterpart</b>		<b>14.00</b>	
Government		14.00	
<b>Total</b>		<b>114.00</b>	
<b>9. Effective Development Cooperation</b>			
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) a proposed administration of a grant to be provided by the ADB Strategic Climate Fund (SCF)<sup>1</sup>, both to the Republic of the Maldives for the Preparing Outer Islands for Sustainable Energy Development Project.<sup>2</sup> The Project will replace inefficient fossil fuel based power generation grids on the islands with renewable energy hybrid systems contributing to reductions in the cost of electricity, subsidy burden on the government budget and emission reductions.

## II. THE PROJECT

### A. Rationale

2. The Maldives, located 750 km south west of Sri Lanka, is an archipelago consisting of 26 atolls<sup>3</sup> and a total land area of about 300 sq. km. About half the country's population lives on the outer islands. The Maldives has about 100 MW of installed diesel generation capacity on the inhabited islands and another 100 MW on the tourism islands. While the Maldives has the unique distinction of being the first and the only country in South Asia with 100% access to electricity, this achievement has come at a cost. Given the geographic location of islands, each island is electrified with its own diesel powered mini grid system resulting in expensive and not very reliable supply. The cost of diesel power is unaffordable at 30-70 cents/kWh and requires government subsidies in excess of \$40 million annually. Electricity sector subsidies are also one of identified areas for government expenditure management. In 2012, Maldives spent over \$470 million for oil imports of which fuel imports for electricity generation contributes significantly.<sup>4</sup> The 100% diesel dependence of Maldives also makes its carbon emissions per unit of electricity among the highest in the region. State owned STELCO and Fenaka are the main electricity utilities responsible for supplying electricity to the communities in inhabited islands except a few where Island Councils are still responsible for the supplies.

3. The Maldives has significant renewable energy resources namely solar power and in some pockets wind power. Energy sector studies reveal that the cost of energy generation based on renewable energy and fossil fuel hybrids would be significantly lower compared to existing options. The transition to renewable energy based systems has sound economic rationale. The Government's effort to increase electricity production from indigenous sources, including solar and wind power, to enhance energy security will reduce the pressure on the balance of payments and improve the fiscal position. The Government has initiated two programs – one for the Greater Male region to increase renewable energy generation and the other on the Outer Islands to support energy efficiency and renewable energy investments.

4. The proposed project on the outer islands would transform the existing mini grids through physical investments in renewable energy, energy management and control systems, storage and improvements in distribution networks and significantly reduce the requirement for diesel to generate electricity. Private sector investment projects to support solar photovoltaic investments on larger islands (initially planned for STELCO) are under consideration outside

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<sup>1</sup> Under the Scaling Up Renewable Energy Programs in Low-Income Countries financed by the Strategic Climate Fund

<sup>2</sup> Asian Development Bank (ADB) provided project preparatory technical assistance (PPTA) for Preparing the Outer Islands Sustainable Energy Development Project TA 8268.

<sup>3</sup> The Maldives has 1192 islands of which 194 islands are inhabited.

<sup>4</sup> The Maldives is considered one of the most oil vulnerable countries with oil imports close to 35% of GDP in 2012.

and complementary to the Project In addition, de-carbonization of the private tourist islands is expected to be supported over the medium term by the Government through policy measures as well investment interventions supported by ADB's Private Sector Operations Department and the Strategic Climate Fund. ADB will also support the utilities on demand-side-management (DSM) interventions targeting household and other sectors through ongoing technical assistance.

5. The Maldives has a sector roadmap for de-carbonization of the nearly 160 outer islands that are currently serviced by the utilities The Government has a national energy policy to support the development of the electricity sector including a sector roadmap and investment plan for implementation. Capacity at institutions including the Maldives Energy Authority (MEA), the Ministry of Environment and Energy (MEE) and the utilities are being progressively enhanced for achieving the roadmap. The project is aligned to ADB's Strategy 2020 of supporting sustainable energy growth, Energy Policy 2009 and is a part of the Maldives COBP for 2013-2015. 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 the islands that meet the eligibility criteria<sup>5</sup>.

6. **Lessons learned from on-going projects.** ADB's operations in the power sector since 1985 were instrumental in meeting electricity demand in the capital of Male and for building capacity in STELCO. Subsequently, since 2002 ADB supported the outer island electrification project that provided diesel generators and grid investments in 19 islands. There were several lessons from earlier programs include (i) ADB collaborating with other development partners to leverage existing resources, (ii) requirement for detailed technical, economic, financial appraisal of projects prior to approval, (iii) the need for technical support to strengthen institutions such as MEA etc. The proposed project design incorporates the lessons from those projects. Since the project is based on a sector approach, detailed design has been carried out for a sample of 5 islands representing all the inhabited islands. This sample will be the first to undergo the proposed investments. Co-financing has been sought from multiple partners on a parallel basis and the integration of outer islands into 1 agency will facilitate procurement as well as standard practices for financial management. Since 2012, ADB has been supporting the MEA in preparation of technical codes and standards as well as regulations for the electricity sector including preparing for renewable energy investments. A consulting firm will support the project management unit (PMU) for screening, surveys, prepare bidding documents, for selection of contractors and to oversee construction activities. The implementation and disbursement schedules are realistic and take into account difficulties encountered into project implementation in Maldives.

7. **Coordination with other donors.** The POISED project has evolved from a smaller program planned under a medium term investment plan prepared by the Maldives in 2012. Since then, several donors including the Islamic Development Bank (IsDB), the European Investment Bank (EIB) and other bilateral agencies have expressed interest in co-financing with ADB for POISED. The project components are complementary to operations of the World Bank Group<sup>6</sup> planned in 2014 and 2015. The public sector investments in the distribution grid, control systems, diesel generators and energy storage devices being financed under the Project by ADB and its partners would facilitate more efficient operations and enable the utilities to achieve the proposed fuel saving targets.

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<sup>5</sup> Identified in the Project Administration Manual

<sup>6</sup> The World Bank is supporting a private sector solar PV investment program for 4 islands in Greater Male in the initial phase and a proposed partial risk guarantee product for private sector investment in renewable energy that is under design.

## B. Impact and Outcome

8. The impact of the proposed project would be enhanced renewable based sustainable energy sector in the Maldives to be achieved by 2022. The outcome would be the reduction of diesel usage for electricity generation in outer islands of the Maldives to be achieved by 2019.<sup>7</sup>

## C. Outputs

9. The project outputs are (i) renewable energy ready mini grid systems developed for outer islands; and (ii) enhanced capacity of MEE, STELCO and Fenaka to implement renewable energy mini grids. Output 1 includes detailed design and installation of equipment for solar diesel hybrid mini grids for about 160 medium and small outer islands. It will commence in 2014 with investments on 5 sample sub-projects and a control center to be scaled up to other islands using an eligibility criteria. Capacity building under output 2 would include procurement; project management, technical; financial management; gender and safeguard support and training that would commence in 2014 for the duration of the project.

## D. Investment and Financing Plans

10. The project is estimated to cost \$114 million (Table 1). Detailed cost estimates by expenditure category and detailed cost estimates by financier are included in the project administration manual.

**Table 1: Project Investment Plan**  
(\$ million)

Item	Amount <sup>a</sup>
<b>A. Base Cost<sup>b</sup></b>	
1. Output 1	100.3
2. Output 2	4.0
<b>Subtotal (A)</b>	<b>104.3</b>
<b>B. Contingencies<sup>c</sup></b>	<b>8.1</b>
<b>C. Financing Charges During Construction</b>	<b>1.6</b>
<b>Total (A+B+C)</b>	<b>114.0</b>

<sup>a</sup> Renewable energy projects are exempted from import duties. Any taxes or duties, if applicable, would be financed from government resources

<sup>b</sup> In mid-2014 prices.

<sup>c</sup> 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: ADB Staff Estimates

11. The government of the Maldives has requested a grant<sup>8</sup> 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 Strategic Climate Fund<sup>9</sup> (SCF) will provide a grant co-

<sup>7</sup> Diesel reduction to be achieved through replacement of existing inefficient diesel generators, distribution system upgrades, and the replacement of diesel power by renewable energy and storage solutions in a phased manner

<sup>8</sup> A country's eligibility for ADF grants under the revised grant framework is determined by its risk of debt distress. The latest debt sustainability analysis determined that Maldives has a high risk of debt distress and was therefore eligible to receive 100% of its ADF allocation as grants.

<sup>9</sup> Under the Scaling Up Renewable Energy Program in low income countries financed by the Strategic Climate Fund (SCF). Administered by the Asian Development Bank. In 2012, the SCF endorsed the Investment Plan submitted by Government of Maldives requesting \$ 12.0 million grant to be administered by ADB for the project. The PPTA

financing of \$12 million, to be administered by ADB. These funds will be on lent to STELCO and Fenaka by the Government as local currency loans for a period of 20 years including 5 years of grace at an interest rate of 2%. IsDB<sup>10</sup> and EIB<sup>11</sup> have expressed interest in co-financing POISED on a parallel basis<sup>12</sup>. IsDB 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 \$40 million, for 15 years at an interest rate of 61 basis points over LIBOR. IsDB and EIB loans will be on lent by the Government to STELCO and Fenaka on terms and conditions acceptable to these agencies for investments in the Outer 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.

**Table 2: Financing Plan**

Source	Amount (\$ million)	Share of Total (%)
Asian Development Bank	38.00	33.3
Strategic Climate Fund <sup>a</sup>	12.00	10.7
Islamic Development Bank <sup>b</sup>	10.00	8.8
European Investment Bank <sup>c</sup>	40.00	35.1
Government of Maldives	14.00	12.1
<b>Total</b>	<b>114.00</b>	<b>100.0</b>

<sup>a</sup> Under the Scaling up Renewable Energy Program for low income countries financed by the Strategic Climate Fund administered by Asian Development Bank.

<sup>b</sup> Parallel financing for future sub-projects starting 2015.

<sup>c</sup> Financing expected to be routed through Bank of Maldives to sub-projects starting 2015.

Source: Fact Finding Mission in April 2014 and staff review meeting in May 2014

## E. Implementation Arrangements

12. The executing agency (EA) will be the Ministry of Finance and Treasury (MOFT). A Project Management Unit (PMU) comprising the officials from MEE, MOFT, Fenaka and STELCO has been setup for coordination of activities under the project. The implementing agencies (IA) would include MEE, Fenaka and STELCO. Project agreements would be entered into with Fenaka and STELCO. The PMU will be strengthened with external experts in the areas of finance, procurement, and contract management. Project Implementation Units (PIU) with adequate staff will be established in FENAKA and STELCO to assist in preparing an overall implementation plan, contract packing and annual budgets. PIUs will also be responsible for overall intra-agency and intra-department coordination; bid management, project management, plan implementation, monitoring and evaluation of project outputs and results. It will provide project implementation support to contractors and will liaise with the islands where project is to be implemented. It will also be responsible for organizing training programs for building institutional capacity of FENAKA and STELCO.

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received \$750,000 of grant financing from SCF to develop the components. In accordance with established CIF procedures, SCF approval for the project will be received after staff review meeting prior to grant negotiations.

<sup>10</sup> In 2012, Islamic Development Bank and ADB signed a minutes of meetings to work together to support a renewable energy sector project in the Maldives.

<sup>11</sup> In 2013, European Investment Bank (EIB) indicated interest to co-finance POISED and to channel the funds through the Bank of Maldives. A communication in this regard was sent out from EIB to the Ministry of Finance and Treasury in the Maldives.

<sup>12</sup> On 7 May 2014, the Cabinet of the Republic of the Maldives has expressed interest in receiving loans from EIB and IsDB for POISED. This will enable processing of these loans. The Parliament of the Maldives will need to provide final approval for any borrowings.

13. The project will be implemented in four phases. Feasibility studies of 5 sample projects the islands of S. Addu, B. Goidhoo, Th. Buruni, Ga. Vilingili and Lh. Khurendhoo were completed. These will be the first projects to be taken up during 2014 for implementation as Phase 1. An implementation team including functional experts in technical, procurement, financial management, social and environmental safeguards will be established in 2014 to provide support the PMU to review the final design and for implementation of the solar diesel hybrid mini grids in the 5 islands. The sub-projects in subsequent phases will include diesel genset and grid replacement as well as solar PV and energy storage and would be taken up starting 2015 using an atoll wise approach based on the proposed eligibility criteria. An atoll wise approach is preferred<sup>13</sup> for future sub-projects for better planning and implementation efficiencies. ADB Procurement Guidelines would be followed for procurement of ADB financed and administered components.<sup>14</sup>The implementation arrangements are summarized in Table 3 and described in detail in the project administration manual.<sup>15</sup>

14. The World Bank is planning a program to provide partial risk guarantees to private sector solar PV investors in the Maldives. This is expected to be rolled out in 2015 starting with STELCO. In addition, the World Bank will provide support for solar PV on 4 islands in STELCO. Based on past experience including in the 6 island solar PV project in the Maldives, the efficacy of solar PV investments to reduce diesel consumption would depend on the readiness level of the mini-grid to manage the intermittency of solar PV injections. Coordination with the World Bank program is therefore critical and would be taken up by the PMU under the project. Further, ongoing capacity development technical assistance to MEE and MEA<sup>16</sup> to support development of key regulations, facilitate private sector investment and meet key sector objectives will continue with support from SCF.<sup>17</sup>

**Table 3: Implementation Arrangements**

Aspects	Arrangements		
Implementation period	June 2014 – December 2019		
Estimated completion date	31 December 2019		
Management			
(i) Oversight body	Inter-ministerial steering committee comprising ministers from Finance and Treasury, Environment and Energy, Economic Development Government of Maldives		
(ii) Executing agency	Ministry of Finance and Treasury, Government of Maldives		
(iii) Key implementing agencies	MEE, Fenaka and STELCO		
(iv) Implementation unit	Project Management Unit (PMU) located at MEE, 7 staff proposed. Project Implementation Units (PIU) at STELCO and FENAKA		
Procurement	International competitive bidding	6 contracts (under ADB) EIB, IsDB to follow own procurement guidelines	\$ 44 million
	National competitive bidding	none	

<sup>13</sup> Based on a review of the Outer Island Electrification Project (2002).

<sup>14</sup> On 18 March 2013, the Board approved a blanket waiver of member country procurement eligibility restrictions in co-financed ADF operations.

<sup>15</sup> Project Administration Manual (accessible from the list of linked documents in Appendix 2).

<sup>16</sup> TA 8000: Capacity Building of the Maldives Energy Authority.

<sup>17</sup> About 0.4 million USD is being provided by the Strategic Climate Fund to support MEE and MEA for periodic updates of the sector roadmap and investment plans, environmental management guidelines, private sector investment support and productive energy end usage.

Aspects	Arrangements
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
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.

EIB = European Investment Bank, IsDB = Islamic Development Bank, MEE = Ministry of Environment an Energy, PIU = project implementation unit, PMU = project management unit, STELCO = state electricity company  
Source: ADB Staff Estimates.

15. The PMU staff will be responsible for screening and due diligence on whether proposed sub-projects meet the eligibility criteria for POISED and would 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

### III. DUE DILIGENCE

16. The project is considered viable after the completion of due diligence and an assessment of the costs, benefits and impacts. It will benefit the Outer Islands of the Maldives with the availability of cheaper, cleaner and more reliable power. It will also reduce the subsidy burden on the government permitting financing of key social priorities of the government. 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 country's balance of payments.

#### A. Technical

17. The Government has a national energy policy and a sector roadmap to convert outer islands to renewable energy hybrid mini grids. 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 which optimizes the use of different energy sources for electricity generation including renewable energy such as wind and solar power<sup>18</sup>. 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 under Fenaka and some of the STELCO islands that could have interventions under POISED. The roadmap is viable and technology has been selected based on the operational requirements, local conditions and capacity for operation and maintenance in remote islands. The procurement and implementation experience from the first set of islands implemented in 2015 would provide useful information for the structuring of future procurement.

<sup>18</sup> HOMER, originally designed at the National Renewable Energy Laboratory in the United States, is a computer model that simplifies the task of designing hybrid renewable micro-grids. 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.

## B. Economic and Financial

18. 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 (1997). The project is economically viable with benefits outweighing the costs. The EIRRs of the 5 sample projects range from 14% to 40.17% while the benefit to cost ratios range from 1.06 to 1.4. The combined sample has an EIRR of 31.32%. Sensitivity analysis shows that the project returns are robust against changes to critical variables with a minimum EIRR of 11.5% in the worst case scenario of 20% escalation in capital costs.<sup>19</sup> The project components will support reduced diesel consumption per unit of electricity sold through replacing diesel generation sets and grids on nearly 160 islands and 21 MW of solar power generation. The project will support the reduction 40,000 tons of CO<sub>2</sub> in 2019 against the baseline emissions in the power sector.

19. Financial analysis of the project was carried out in accordance with ADB's Financial Management and Analysis of Projects.<sup>20</sup> All financial costs and benefits are expressed in constant 2014 prices. The weighted average cost of capital was estimated at 1.2% (in post-tax real terms). Based on conservative assumptions adopted for base case analysis<sup>21</sup>, a 1.39% increase in diesel costs<sup>22</sup> and periodic increase in fuel surcharges to reflect the fuel cost increases, the FIRR for the sample projects exceeds the WACC for all sample sub-projects. Sensitivity analysis shows the project returns are robust against changes in critical variables.

## C. Governance

20. Financial management, procurement, anticorruption, policy and legal, capacity, and other institutional issues and mechanisms were assessed during the PPTA. The PMU would report to an inter-ministerial Steering Committee comprising State Ministers of Finance and Treasury, Environment and Energy and Economic Development. The financial management risk is rated high and a roadmap on the roll out of the program 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 project administration manual.<sup>23</sup>

## D. Poverty and Social

21. Poverty reduction and social issues were reviewed for sub-projects during the PPTA. The project will ensure several direct benefits to communities, which are as follows (i) support to use renewable energy sources available in outer islands; (ii) support 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 groups.

<sup>19</sup> Economic Analysis (accessible from the list of linked documents in Appendix 2)

<sup>20</sup> ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

<sup>21</sup> In the base case, the only independent hydropower projects that were considered for evacuation of power by the project facilities were those with signed power purchase agreements and 20% of those to which survey licenses have been issued.

<sup>22</sup> World Energy Outlook current scenario

<sup>23</sup> Project Administration Manual (accessible from the list of linked documents in Appendix 2).

## **E. Gender Development**

22. Gender issues and opportunities for mainstreaming were also considered in the preparation of the project based on the due diligence carried out for the 5 islands. The project has been 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. GAF includes the following key outputs: (i) household demand-side-management program to improve energy efficiency, targeting women household consumers, which will link up with and further develop Fenaka's community outreach program; (ii) creating an enabling environment for women's microenterprise development, (iii) promoting women's employment and training during project construction and subsequent systems operation and maintenance in the outer islands, (iv) training for Fenaka and STELCO staff in gender inclusive community outreach approaches, and (v) a gender mainstreamed management system 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 for to support the utilities to implement the GAF. The project will promote and advocate for a socially inclusive, gender equitable and non-discriminatory 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 at project areas.

## **F. Safeguards**

23. **Environment.** The project is classified environment category B. An environmental assessment and review framework (EARF) has been prepared and the initial environment examination (IEE) with environmental management plan (EMP) for the sample projects were prepared following ADB's Safeguard Policy Statement (2009) and as per OM/F1, 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 the construction and operation phase. Adequate mitigation measures have been incorporated into the EMP. Public consultation and information disclosure requirements have been met. Measures for EA's and IAs' capacity enhancement on implementation of EMP are also included in the IEE. The solar PV systems financed by the project will be mounted on the structures above 3-4 m height and other project facilities are expected to be resilient to climate change through compact and preassembled systems resistant to extreme weather conditions.

24. **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 brought out no resettlement impacts and no adverse impacts on indigenous groups. A resettlement framework has been prepared for the project. For all the subsequent subprojects that have resettlement impacts, resettlement plans will be prepared in accordance with the safeguard provisions in the resettlement framework. If any changes or additional land requirements or involuntary resettlement impacts are identified during implementation, a resettlement plan will be prepared or modified according to the applicable laws referred to in the resettlement framework. ADB's prior approval will be obtained before further implementation of the relevant subproject. The social and environmental safeguards will be conducted by Fenaka/STELCO, assisted by the PMU.

## G. Risks and Mitigating Measures

25. Major risks and mitigating measures are summarized in Table 4 and described in detail in the risk assessment and risk management plan.

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

<b>Risks</b>	<b>Mitigating Measures</b>
Expected reduction in diesel use and government subsidy through renewable energy would be offset by increases in demand.	Demand side energy efficiency measures to be supported including through ongoing sources of bilateral funding. The proposed solutions are modular and scalable to meet increased demand.
Financial management and governance aspects to be strengthened in Fenaka	Utility accounts have been finalized for Fenaka and external audits to be completed in 2014. Covenants on financial management proposed. External expertise in financial management and procurement to be provided.
Implementation delays could result in time and cost over runs.	Implementation is planned on an atoll wise basis. Adequate contingencies are provided and advance procurement being initiated. Strong Project Management Unit support and timely guidance from the inter-ministerial steering committee will support the project.
Lack or limited interest in private sector participation in renewable energy generation on the outer islands.	A phased approach towards private sector participation on the outer islands would be followed starting with public sector investments supported by ADB in 2014 followed by possible private investments supported by the planned WB guarantee in 2015. The sector project approach is flexible and periodic reviews will assess implementation and need for course corrections.
Rapid turnover in PMU staff.	The PMU will be supported by a specialist team over the implementation period.
Risks related to Climate Change	The project will provide solar PV systems which will be mounted on the structures above 3-4 m. Other project facilities will be with resilience to climate change through compact and preassembled systems resistant to extreme weather conditions. Therefore the project will not be affected by the change in sea level rise.

PV = photovoltaic, WB = World Bank  
Source: Asian Development Bank

## IV. ASSURANCES AND CONDITIONS

26. 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 project administration manual and grant documents.

27. The government, MEE, STELCO and Fenaka have agreed with ADB on certain covenants for the project, which are set forth in the grant agreement and project agreement.

## V. RECOMMENDATION

28. 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 Island Sustainable Energy Development Project, on terms and conditions that are substantially in

accordance with those set forth in the draft grant and project agreement(s) presented to the Board.

- (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 Island Sustainable Energy Development Project to be provided by the ADB Strategic Climate Fund.

Date

President

### DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks <sup>a</sup>
<p><b>Impact</b> Enhanced renewable-based sustainable energy sector in the Maldives.</p>	<p><b>By 2022:</b> Increase contribution of renewable energy in the supply mix of Maldives to 25% (2009 Baseline: Less than 1%)</p> <p>All outer islands initiate electricity sector de-carbonization and the reduction of CO2 emissions to 0.6 kg of CO2/kWh<sup>1</sup> (2009 Baseline: 0.9 kg of CO2/kWh).</p>	<p>Ministry of Energy and Environment annual report</p> <p>Ministry of Energy and Environment annual report</p>	<p><b>Assumptions</b> Project can be replicated to other islands (including resort islands) on a commercial basis based on trends in RE costs.</p> <p><b>Risks</b> Sudden unexpected changes to world oil prices</p> <p>Electricity demand growing beyond the forecast leading to increased diesel based generation beyond expected levels</p>
<p><b>Outcome</b> Reduction of diesel usage for electricity generation in outer islands of the Maldives.</p>	<p><b>By 2019:</b> Transition to reduce specific diesel consumption to 0.1-0.3 liters/kWh consumed on outer islands (2012 Baseline: 0.45-0.70 liters/kWh consumed on outer islands)</p> <p>Electricity tariffs on average improve to closer to 100% of the cost</p> <p>(2011 Baseline: Present retail tariffs cover under 50% of cost on average<sup>2</sup>)</p> <p>CO2 emission reduced by 40,000 tonnes in the power sector</p> <p>(Baseline forecast - 400,000 tonnes in 2019)</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><b>Assumptions</b> Private sector partial risk guarantee from IDA introduced in a timely manner to facilitate private RE investments in the islands.</p> <p>Electricity grid and diesel gen sets with necessary control systems prepared adequately to facilitate private sector investment in Solar PV in a timely manner.</p> <p><b>Risks</b> Tariffs, guarantees not adequate for private sector investor interest.</p>

<sup>1</sup> Through energy efficiency and renewable energy

<sup>2</sup> Tariffs are about 45% of cost coverage for domestic consumers (SREP Investment Plan 2012).

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks <sup>a</sup>
<p><b>Outputs</b></p> <p>Renewable energy ready mini grid systems developed for Outer Islands</p>	<p><b>By 2019:</b></p> <p>21 MW of solar PV, 7 MWh of energy storage installed; 20 MW of diesel gensets replaced; and the distribution grids upgraded in 160 islands</p>	<p>Fenaka and STELCO Annual Reports</p>	<p><b>Assumptions</b></p> <p>Co-financing from IsDB and EIB approved in time</p> <p><b>Risks</b></p> <p>Delays/changes in island selection by Government. Unexpected significant increase in price of raw materials and power plant components.</p>
<p>Enhanced capacity of MEE, STELCO, Fenaka to implement RE mini grids</p>	<p><b>By 2019</b></p> <p>Roadmap for outer island transition to renewable energy developed.</p> <p>Up to 60 Fenaka and STELCO staff [Target includes at-least 25% women] trained to implement the roadmap for renewable energy mini grid systems and 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% women's participation in all community outreach activities</p> <p>Reduced off-peak and/or shoulder rate tariffs provided for women-led micro and small enterprises (MSME).<sup>i</sup></p> <p>Target: At least 2 training and information sessions per project phase.</p>	<p>MEE Annual Report</p> <p>Fenaka and STELCO Annual Report</p> <p>Fenaka and STELCO Annual Report</p> <p>Fenaka and STELCO Annual Report</p>	<p><b>Assumptions</b></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><b>Risks</b></p> <p>Rapid turnover in PMU staff</p>

<p><b>Activities with Milestones</b></p> <p><b>1. Renewable energy ready mini grid systems developed for Outer Islands</b></p> <p>1.1 Issuance of bidding documents for Phase 1, contract awards for mini grid systems (30 Jun 2014 - 1 Dec 2014)</p> <p>1.2 Commissioning Phase 1 (1 Sept 2015 - 31 Dec 2015)</p> <p>1.3 Issuance of bidding documents for Phase 2 and contract awards for mini grid systems (31 Mar 2015 - 30 Sept 2015)</p> <p>1.4 Commissioning Phase 2 (30 Jun 2016 - 30 Sept 2016)</p> <p>1.5 Issuance of bidding documents for Phase 3 and contract awards for mini grid systems (31 Mar 2016 -30 Sept 2016)</p> <p>1.6 Commissioning Phase 3 (30 Jun 2017 -30 Sept 2017)</p> <p>1.7 Issuance of bidding documents for Phase 4 and contract awards for mini grid systems (31 Mar 2017 - 30 Sept 2017)</p> <p>1.8 Commissioning Phase 4 (30 Jun 2018 - 30 Sept 2018)</p> <p><b>2. Enhanced capacity of MEE, STELCO, Fenaka to implement RE mini grids</b></p> <p>2.1 Procurement of consulting services to support PMU, Fenaka and STELCO on design, implementation and project management to commence (30 June 2014 – 31 Dec 2014)</p> <p>2.2 Bid evaluation for Phase 1 (30 Sep 2014 - 31 Dec 2014)</p> <p>2.3 Review of the identified design, preparation of safeguards and other island specific information for Phase 2 (30 Sept 2014- 31 Mar 2015)</p> <p>2.4 Review of the identified design, preparation of safeguards and other island specific information for Phase 3 (30 Sept 2015 - 31 Mar 2016)</p> <p>2.5 Review of the identified design, preparation of safeguards and other island specific information for Phase 4 (30 Sept 2016 - 31 Mar 2017)</p> <p>2.3 Periodic review of implementation progress of the four phases (30 Jun 2014 – 31 Dec 2019)</p> <p>2.5 Training program for capacity development for PMU, STELCO, Fenaka implemented (1 Apr 2015 – 31 Dec 2017)</p> <p>2.6 Preparation of quarterly progress reports and to meet other reporting requirements (1 Jan 2015-31 Dec 2019)</p> <p>2.7 Implementation of the Gender Action Framework (31 Mar 2015-31 Dec 2019)</p>	<p><b>Inputs</b></p> <p><b><u>Grant</u></b></p> <p><b>ADB: \$ 38.0 million</b></p> <p><b>ADB Strategic Climate Fund: \$ 12.0 million</b></p> <p><b><u>Loan</u></b></p> <p><b>Islamic Development Bank : \$ 10.0 million</b></p> <p><b>European Investment Bank: \$ 40.0 million</b></p> <p><b>Government: \$ 14.0 million</b></p>
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ADB = Asian Development Bank; EA = Executing Agency; GoM = Government of Maldives; kV = kilovolt; kW = kilowatt; MEE = Ministry of Environment and Energy; MEA = Maldives Energy Authority; RE = renewable energy; SCF = Strategic Climate Fund; STELCO = State Electricity Company

Source: Discussions during fact finding mission in March 2014.

**LIST OF LINKED DOCUMENTS  
[WWW....]**

1. Grant Agreement
2. Project Agreement
3. Power Sector Assessment
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 Framework
12. Initial Environmental Examination
13. Environmental Assessment and Review Framework
14. Resettlement Framework
15. Risk Assessment and Risk Management Plan

**Supplementary Documents**

16. Summary of the due diligence reports of sample islands
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