

**PROJECT INFORMATION DOCUMENT (PID)  
IDENTIFICATION/CONCEPT STAGE**

Report No.: PIDC23161

<b>Project Name</b>	Small Islands ASPIRE Supplement
<b>Region</b>	SOUTH ASIA
<b>Country</b>	Maldives
<b>Sector(s)</b>	Other Renewable Energy (100%)
<b>Theme(s)</b>	Climate change (60%), Other Private Sector Development (40%)
<b>Lending Instrument</b>	Lending Instrument
<b>Project ID</b>	P155126
<b>Borrower Name</b>	Ministry of Finance and Treasury, MoFT
<b>Implementing Agency</b>	Ministry of Environment and Energy, MEE
<b>Environment Category</b>	B - Partial Assessment
<b>Date PID Prepared</b>	12-May-2015
<b>Estimated Date of Approval</b>	19-Jul-2016
<b>Initiation Note Review Decision</b>	The review did authorize the preparation to continue

## **I. Introduction and Context**

### **Country Context**

The Maldives is among the most geographically dispersed countries; spread over 900 kilometers, with only 188 of its 1,192 islands being inhabited. 105 of them are self-contained tourist resorts and 21 are used for commercial activities. In the early 1980s, the Maldives had a population of 156,000 and was one of the world's 20 poorest countries. With a population of over 341,000, it is now a middle-income country with GDP per capita of US\$3,930.1 (refer <http://planning.gov.mv/yearbook2013/yearbook/National%20Accounts/16.1.pdf>). Compared to other countries in South Asia, Maldives ranks first in terms of per-capita GDP and it is second only to Sri Lanka based on the Human Development Index ranking. Poverty rates, as measured by the headcount ratio at 15 Rufiyaa per person per day, have fallen steeply, from 21% in 2003, to 15% in 2010. Other human development indicators - infant mortality, maternal mortality, or educational attainment - have registered similar improvements. The country had achieved 5 out of 8 Millennium Development Goals (MDGs) by 2007, but progress has been relatively slower towards ensuring environmental sustainability (MDG7) and developing a global partnership for development (MDG8). While poverty has declined sharply overall in recent years, vulnerability and inequality are a concern, as a significant number of people fell back into poverty during the recent crisis, and the disparities between remote islands with small populations and the capital Male' region remain substantial.

Maldives is largely dependent on tourism and fisheries and vulnerable to external shocks as witnessed by the economic recession following the tsunami of December 2004. Tourism accounts directly for around 30 percent of nominal GDP (relative to GDP at basic prices), and has accounted for about 28% of real GDP growth between 2002 and 2013. But while tourism accounts for about a

third of the country's GDP, it only contributes to 7% of the employment in the country. As opposed to tourism, fisheries accounts for a very small contribution to GDP (1.7%) but a larger share of employment (10.5%) (in 2010). Since 2008, tourism has taken a hit from weaker demand from Europe, the country's largest market, which along with political instability and loose fiscal policy have deteriorated the country's fiscal position and made macro-management difficult. The share of European tourists to Maldives has dipped from about 73% in 2008 to 54% in 2012. Fortunately, tourism demand has picked up and the growing Chinese tourist segment is compensating for the weaker volume of arrivals from Europe. The share of Chinese tourists has increased from little over 6% in 2008 to almost 24% in 2012 (refer <http://planning.gov.mv/yearbook2013/yearbook/Tourism/10.1.pdf>).

Expenditure trends over the past five years show an increasing gap between revenues and expenditures, financed by unsustainable levels of public debt. In 2013, total expenditures were above 42.6% of GDP, while total revenue collection stood at about 32.8% of GDP (the highest in South Asia Region (SAR)). The fiscal deficit increased from around 11.3% of GDP (including grants) in 2008 to 13.5% of GDP in 2012 - purely in cash terms and closed at 9.8% for 2013. When one includes payment arrears, the deficit is considerably higher by over 3% of GDP. This is the result of higher-than-budgeted expenditures from increased subsidies (including electricity subsidies to end consumers), social welfare payments, and transfers to state-owned enterprises (SOEs). Consequently, the public sector debt dynamics worsened, reaching over 86% of GDP in 2013.

The country lacks land based natural and mineral resources. As a result virtually all economic production is highly dependent on imports, creating a heavy dependence on foreign exchange earnings. Intensive agricultural production is limited because of the poor quality of soil and the limited availability of fresh water. Increasing the quality of service provision to a standard commensurate with the country's income levels is a challenge in this environment.

The country has no conventional resources of energy. Providing electricity to the dispersed islands is overwhelmingly dependent on imported diesel fuel oil, and therefore vulnerable to fuel price volatility. Island-based distributed generation is the only viable option for most of the islands, while some level of grid integration across the more populated islands near the capital is feasible. Diesel fuel oil accounts for bulk of the energy supply in the country (about 82.5% in 2009). Further, imported fossil fuel generates more than 80% of the Maldives' emissions. The country spends over US\$240 million per year importing fossil fuels (equivalent to 16% of GDP) in 2010. One-third of the country's population is in the capital, Malé. The transport of goods and people between islands is fuel-intensive, and it is not possible to gain scale and efficiency through a countrywide electrical grid system. Small, dispersed electric generators provide electricity to each island's grid. Until now the data on renewable energy has been limited but research and investment into renewables has been growing since announcement of the Country to turn carbon neutral by 2020, two years ago. Maldives is pinning its hopes principally on solar power, with a target for delivering 60% of the country's electricity from solar panels by 2020. The effort by the Government includes researching about the appropriate technologies that are suitable for different parts of the country and then deploying them as cheaply as possible through incentives like import duty exemption for renewable energy products. The cost for the package of low-carbon measures is estimated to be about US\$110 million a year for 10 years. The scheme should pay for itself quite quickly, because Maldives will no longer need to import oil products for electricity generation, transport and other functions. If the oil price were at US\$100 per barrel, the payback period would be as short as 11 years. Although

climate change leadership is the key driver behind the Maldives' plan, the government is keen to emphasize the broader benefits of switching to renewables in terms of cost and energy security.

### **Sectoral and Institutional Context**

As mentioned above, almost all of the Country's current power needs are met through diesel fired generation. The cumulative installed electricity capacity in Maldives was approximately 245 Mega Watt (MW) in 2012. Of this, 105 MW (43% of installed capacity) is located in resort islands which run their systems independent of state-owned utilities. The fuel has to be imported and transported to the dispersed generating locations, adding to the cost and difficulty of maintaining reliable power operations. As a result, the Maldives has among the highest cost of electricity generation in South Asia - 30-40 US\$ cents per kilo Watt-hour (kWh) in the larger islands, and even higher in the remote small islands. Despite these challenges, access to electricity is universal in the Maldives, and the Government of Maldives (GoM) is constitutionally obligated to ensure the provision of electricity to every inhabited island at a reasonable standard.

The 2010 National Energy Policy and Strategy (NEPS 2010) is centered on creating an enabling environment for the growth of a reliable and sustainable energy sector. NEPS 2010 focuses on making energy supply secure and affordable and reversing the increasing dependence on diesel powered electricity generation in the Country amongst other objectives. The targets set under this strategy are to become carbon neutral in energy sector by 2020, ensuring 50% of the electricity is from renewable energy sources by 2015, achieving a 50% reduction in energy sector Green House Gas (GHG) emissions by 2015 compared to 2000, and reaching a saving of 7.5% of final energy consumption over 10 years until 2020 through efficiency.

The main energy sector stakeholders in Maldives are Ministry of Energy and Environment (MEE), Maldives Energy Authority (MEA), and the two state owned utilities – State Electric Company Limited (STELCO) and FENAKA. STELCO and FENAKA are responsible for generation and distribution of electricity in the country. STELCO is the largest utility and was established in 1949 to provide electricity in eight islands as well as the capital, Male, serving around 43% of the Country. STELCO has a total installed capacity of 80 MW with about 62 MW of installed capacity in Male itself. For serving rest of the islands, in 2009, six new utility companies were formed to provide affordable and quality utility services to six regions of the Maldives. These utilities were later merged into one utility 'FENAKA Corporation Ltd.' in June 2012 as a public company with 100% Government share with a mandate to provide island communities (except the greater Male' region) with not only electricity but also water, sewerage and waste treatment. The objective behind formation of FENAKA was better management and sharing of scarce technical man-power and resources. FENAKA currently operates in 150 islands and is responsible for about 54 MW of total generation (22% of the installed generation capacity of the Maldives). As the proposed Project is to be implemented in the smaller islands, the key off-taker of power generated for the Project will be FENAKA.

A financial analysis of STELCO and FENAKA reveals a financial position burdened by a high fuel price component in electricity generation. The tariff (which includes a fuel surcharge) is subsidized but remains high for consumers, and varies from island to island. As per Schematic Country Diagnostics of Maldives, “Due to high costs of domestic electricity production and distribution, the country has a long history of subsidized energy prices. The current system of explicit electricity subsidies was introduced in 2009 in parallel with the reform of electricity tariffs. While the

electricity tariff reform was meant to curb utility providers' losses by allowing a cost-recovering pricing, the contemporaneous introduction of subsidies had the effect of transferring the cost of the electricity tariff reform and of any future increase in fuel prices onto the government's budget. Over the last four years, spending on electricity subsidies increased 9 times, escalating from 0.3 percent of GDP in 2010 to 2.7 percent in 2014." In absolute terms, the subsidy remains a large burden on public expenditure absorbing US\$26 million in 2011, representing about 5 US cents per kWh. The subsidy amount is growing as demand for electricity grows (about 8-11% per annum) and oil prices remain volatile. Electricity tariffs are approved by MEA. Tariff reform undertaken in 2009, cut subsidies and increased the electricity tariff charged by STELCO by an average of 25% (without accounting for the fuel surcharge component). MEA's tariff fixing mechanism is evolving; and this process is being supported by ADB, which is helping to implement a more rigorous methodology based on cost recognition and recovery. Ongoing tariff reforms with upcoming initiatives supported by development partners addressing T&D performance and system integration of renewable energy would position Maldives favorably to enhance its energy outlook. FENAKA being a new company has a limited profitability at a net profit margin of just below 3% and needs backstopping and assistance for growth. FENAKA would benefit from a power generation technology with more stable and lower cost of production, such as photovoltaic based electricity, and from improved energy efficiency measures.

The World Bank is currently supporting the GoM in transitioning to renewable energy through the Accelerating Sustainable Private Investments in Renewable Energy Project (ASPIRE). The ASPIRE project is an offshoot of the Scaling-Up Renewable Energy Program in Low Income Countries (SREP) Investment Plan (IP) that was developed by Ministry of Environment and Energy (MEE), Government of Maldives with an objective to support the scaling up of renewable energy (RE) development in the Country. The SREP IP estimated that just rooftop space of individual households and public buildings could meet as much as 30% of the electricity demand in some islands, and as much as 80% in some other islands. The development objective of ASPIRE is to increase solar photovoltaic (PV) generation in Maldives through private sector investment.

The proposed Project of US\$1 million, funded by SIDSDOCK (ESMAP), focuses on expanding the solar energy usage and attracting private sector investment as the solar space is largely dominated by private sector. The cost of power is much higher in outer islands due to their remote location and hence, putting a higher subsidy burden on the Government's exchequer. Further, traditionally, the outer islands have been receiving the 100% grant funding for setting up infrastructural facilities, especially energy and hence it's difficult to have a market driven system altogether. Thus, the proposed Project aims to reduce the subsidy burden on the Government along with introduction of market mechanism partly together with grant money to let the market mature gradually and sustainable in the long run.

#### **Relationship to CAS/CPS/CPF**

The proposed Project is in line with the Bank's Interim Strategy Note (ISN) objective of deepening the Bank Group's support in the area of environmental and natural resource management. The Project will support the government's agenda to move to a carbon neutral economy by using SIDSDOCK funding as financial leverage to mobilize private investment in renewable energy generation.

Further, as noted in the Schematic Country Diagnostic (SCD), "the cost of electricity generation in

Maldives is the highest in South Asia especially in the atolls. Power is supplied by diesel generators through isolated, island specific grids, spread over 900 sq km. The country relies almost entirely on imported fossil fuel to supply the generators, costing about 15 percent of GDP in 2013. Furthermore, due to the high costs of domestic electricity production and distribution, the country has a long history of subsidized energy prices which has contributed to over-consumption on the demand side and has limited incentives opportunities to invest in alternative and environmentally sustainable renewable energy sources. The cumulative installed photovoltaic (PV) based generation capacity is less than 2 MW, spread across several islands and programs. Key constraints to adoption of renewable energy include vested interests and high demand from the resorts.” The proposed Project, to be implemented in the smaller and more remote islands of Maldives, will contribute directly to the objectives of ISN, SCD and NEPS 2010 through increase of renewable energy while avoiding the carbon emissions from diesel based generation. Records show that diesel fueled generation on the outer islands is less efficient than on Male’ and the larger islands (and hence consumes more diesel per unit generated). Since these islands are more remote, transport of fuel to these locations is more expensive, as is the maintenance of the engines. Thus, this Project, along with ASPIRE project, contributes towards greater energy self-sufficiency, minimizing emissions and bringing down the nation’s exposure to global petroleum price volatility. Further, the SCD aims at finding means to reform universal subsidies going to electricity sector to such that the benefits of the same are targeted at the poorest segment of the population. Switching from a high cost diesel-based energy production to a lower cost PV energy production could also allow reductions in tariff benefiting consumers in the medium to long term. Also as the targeted islands under the proposed Project are remote islands, the benefits of the Project are likely to be available to the poorest segment of Maldives.

## II. Project Development Objective(s)

### Proposed Development Objective(s)

As the proposed Project will be using the ASPIRE framework, the project development objective is same as for ASPIRE project. The project development objective is “to increase PV generation in Maldives through private sector investment”. The funding from the proposed Project will go towards the outer and remote islands and will not be funding the same islands as under ASPIRE project making the two projects complementary to each other.

### Key Results

The key results are divided into two categories:

1. Final Results Indicators:
  - 1.1. Increase (through new solar projects) or enhancement (of existing solar projects) in Annual Electricity Output from Solar Energy
  - 1.2. Private Capital Mobilized
  - 1.3. Annual Reduction in Bulk Power Cost in Project Areas
2. Intermediate Results Indicators:
  - 2.1. Mobilization of funding for preparing pipeline of PV projects

## III. Preliminary Description

### Concept Description

#### A. INVESTMENT FRAMEWORK FOR PROPOSED PROJECT:

Currently, Maldives has a cumulative installed PV based generation capacity of around 2 MW, spread across several islands and programs. Under ASPIRE project, IDA and SREP resources are being used to develop and implement an appropriate investment framework that will result in the deployment of PV systems through private sector investments. The investment framework has already been developed and appraised taking into account government and institutional considerations and informed by feedback from potential private investors based on market sounding exercise. The ASPIRE Project has three main components through which the investment framework is operationalized: (1) Technical Assistance Support to GoM for institutional capacity building and preparation of prospective subprojects for offering to private investors, (2) Structuring and Delivery of Tariff Buy Down for subprojects, and (3) Security Package to cover payment shortfalls and termination payments. The components are targeted to make strategic use of the different funding sources (IDA Guarantee, grants, GoM, and private sector funding) to push for increasing private sector investments and risk taking in the PV sector. During appraisal of ASPIRE, it was acknowledged that investment framework will be supplemented with the other funding sources as the ASPIRE Project develops a pipeline and based on a track record.

The PV subprojects in remote islands under the proposed Project will receive support from the provision of tariff buy down funded through SIDSDOCK grant and support from ASPIRE through a security package consisting of an IDA Guarantee and additional payment security funded through SREP grant. The proposed Project will not only look at the new solar projects for investments but also look at the existing solar projects where the utilization of the already installed capacity could be used efficiently, may be by adding storage.

As mentioned above, the proposed Project will use ASPIRE's investment framework as per which it is expected that the key parameters of the subprojects supported by SIDSDOCK including technology, economic and financial outcomes and environmental and social aspects will be materially similar to ASPIRE subprojects. Use of ASPIRE's investment framework also implies that the proposed Project will have similar design, contractual arrangements, and institutional arrangement. Further to that, there is a necessity to create awareness and build technical capacity within the utility/operator to efficiently use solar wherever available. For instance, in case of Thinadhoo Island, the operators are backing down solar instead of diesel when the load is less. For this, the proposed Project will benefit from technical assistance to GoM that will allow the continued development of a pipeline of PV subprojects.

The design and structure of each subproject under the investment framework will be materially similar, given the underlying and relatively simple roof or ground mounted solar PV generation. Moreover, the proposed Project will benefit from lessons from the initial ASPIRE subprojects and technical assistance provided through ASPIRE. As of now, the first subproject under ASPIRE project is in process to be bid out.

Based on ASPIRE project, the proposed Project will fund tariff buy down with allocated funding (of US\$ 1 million) for subprojects in remote islands. The subprojects will be identified and prepared for bidding by MEE and will be under the FENAKA. The subprojects will be bid out to the private sector developers, who will be investing in and operating PV generations. The tariff buy down mechanism in ASPIRE project has been provisioned to provide capital subsidy per installed MW to the developer (and through him, to the utility) so that the Power Purchase Agreement (PPA) price offered by the developer is in the range desired by the off-taking utility. Please note that the end-user tariff is not being affected since that is determined independently, and is currently heavily

subsidized. The tariff buy down will go directly towards reduction in cost of power being purchased by the utilities (STELCO/FENAKA). The actual tariff buy down level may be different, including complete elimination of tariff buy down - based on market assessment for different subprojects. Tariff buy down for larger island subprojects under ASPIRE was estimated to need a maximum of \$300,000/MW; but for the smaller islands where higher solar penetration may be targeted (than larger islands) cost of storage has to be factored in, so a higher tariff buy down may be needed. We estimate that the US\$1 million SIDSDOCK grant will support about 1 MW of capacity. Depending on project details, and where the bids come in, the funding could stretch to more or less capacity additions. As mentioned previously, the available funds under the proposed Project may also be used for promoting efficient utilization of the already installed solar energy capacity (say by adding storage). Disbursements under the Project could be linked to implementation milestones achieved by the developer, such as, upon achieving financial closure, upon commissioning, upon first year of successful operation, etc. This will be developed further based on the lessons learned from experience of first set of sub-projects under ASPIRE.

The proposed Project will be administered by the Project Management Unit (PMU), within the MEE, that has been created and already operating for ASPIRE project. The tariff buy down is expected to be delivered in 1-3 installments either upon commissioning, or towards the end of the construction of a particular subproject (i.e. after the rest of the investment has been completed). The lessons from the initial subproject under ASPIRE will be built into the design of the subprojects under the proposed Project.

Apart from the tariff buy down funded by SIDSDOCK and enhancing the existing installed solar energy capacity, the proposed Project will also depend heavily on the security package as well as capacity building assistance under ASPIRE as explained below. Further, it should be noted that the funding from the proposed Project will go towards the outer and remote islands and will not be funding the same islands as under ASPIRE project, implying that the two projects will be complementary to each other and not competing with each other.

#### B. BUILDING ON ASPIRE PROJECT:

The security package under ASPIRE targets to develop 20 MW given the corpus of funds available under the security package. The same security package under ASPIRE will be made available for about 1 MW of installations under the proposed Project, as appropriate to mobilize private sector investment.

The security package under ASPIRE mobilizes US\$3.9 million of SREP resources alongside US\$16 million of IDA Guarantee exposure to provide a total of US\$19.9 million in security cover. It will function as a combination of a funded escrow account and an IDA Guarantee to (i) backstop short term payment delays by STELCO/FENAKA under Power Purchase Agreements (PPA), as well as (ii) termination events caused by defaults for which either STELCO/FENAKA or GoM are responsible. A US\$3.9 million escrow amount is expected to cover up to 6 months of payments for 20 MW of installations and US\$16 million of the IDA Guarantee will partially cover termination payments for around 8 MW. In reality, it is expected that the level of support needed will taper down over time; hence more MWs may be covered including the 1 MW installation under the proposed Project.

The proposed Project will also build on the technical assistance component that is part of ASPIRE

project under which US\$1.75 million is available to GoM for the following activities:

a. **TA for Enabling Private Investing in PV:** This includes activities are creating an appropriate environment for private investments and reducing preliminary subproject development costs. This includes working with agencies such as MEE and the Maldives Energy Authority (MEA) on follow-up work to implement the private sector policy and regulatory framework for RE subprojects, as well as developing arrangements to guide both off-taker utilities and private sector investors. Such guidance will help the subproject stakeholders negotiate partnerships, agree on and comply with standard contracts such as PPAs and rooftop leasing contracts, and reduce possibilities of conflict, thus enabling the smooth execution of transactions in this energy sub-sector. Standard contracts developed with ASPIRE support will also be used in the proposed Project.

b. **Institutional Capacity Building and Knowledge Sharing:** This support is building local institutional capacity for planning, implementing, operating, and monitoring power systems that are able to absorb increasing amounts of renewable energy. In addition, Maldives is witnessing a sharp increase in demand, and this initiative will address the need to provide necessary information, training and knowledge sharing in the area of renewables and energy efficiency, so that electricity production and use can be optimized. Since the stakeholders are same across the two projects – the proposed Project and ASPIRE project – this component will directly benefit this Project.

c. **Development of Pipeline:** An ongoing exercise to identify and prepare pipeline of subprojects also covers potential subprojects in remote islands. Such islands are focus regions for the proposed Project.

Identification of appropriate subproject sites, resource assessment, pre-feasibility work, as well as aggregation of opportunities into saleable subproject bundles, which can be offered to private sector through competitive bidding, is being supported.

d. **Project Management and Implementation Support:** Provision of operational support for project management, supervision, and monitoring will help in implementing the proposed Project.

#### IV. Safeguard Policies that Might Apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01		x	
Natural Habitats OP/BP 4.04		x	
Forests OP/BP 4.36		x	
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11		x	
Indigenous Peoples OP/BP 4.10		x	
Involuntary Resettlement OP/BP 4.12		x	
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	
Projects in Disputed Areas OP/BP 7.60		x	

#### V. Financing (in USD Million)

Total Project Cost:	1.00	Total Bank Financing:	0.00
Financing Gap:	0.00		
<b>Financing Source</b>			<b>Amount</b>
Borrower			0.00



Energy Sector Management Assistance Program	1.00
Total	1.00

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