



Ministry of Finance
Republic of Maldives

Preparing Outer Islands for Sustainable Energy Development Project - Additional Financing

Project Reference: (IUL)13-K/13/2021/98

Q&A Pre-Bid Meeting REPORT

for

**Procurement of Design, Supply and Installation of Grid-tied Solar PV-Diesel Hybrid Power
Generation Plants in 26 inhabited islands of Raa and Baa Atolls in Maldives**

[TES/2021/G-004]

Client:

Ministry of Environment, Climate Change and Technology

Financing By:

European Investment Bank (EIB)

May 16, 2021

**National Tender
Ministry of Finance
Republic of Maldives**

1 Introduction

The Ministry of Environment has received loan from European Investment Bank (EIB) to finance the cost of implementing the **Preparing Outer Islands for Sustainable Energy Development Project**. It is intended that part of the proceeds of this grant be used for eligible payments for **Procurement of Design, Supply and Installation of Grid-tied Solar PV-Diesel Hybrid Power Generation Plants in 26 inhabited islands of Raa and Baa Atolls in Maldives**, for which these bids have been invited.

A pre-bid meeting was held virtually on **1300 hours 26th April 2021 (Maldivian Time)**. Potential bidders attended the pre-bid meeting through Microsoft Teams®).

2 Clarifications

Some general clarifications are provided here. For specific clarifications, see attachment

2.1 Free Field mounting structure

The free field mounting structure should have a minimum height of 3 m and it should adapted to Maldivian weather conditions. A drawing is provided for reference (see attachment)

2.2 Kmz files for locations

kmz files with the location of the proposed buildings and ground mount zones is provided (see attachment)

2.3 D-hybrid central SCADA located in Male

The Maldives Central SCADA Database is a tool for time and event based logging and analysis data. The following features are available:

With its server-client architecture, it is able to continuously collect data on the multiple project islands and make it available in a centralized database which is located on Malé. All data can be retrieved from the database in form of exports or automatic reports, in daily, monthly or annual intervals. This data include: Island data (Island area, population, no. of consumers), Nominal capacities, Operational data and readings, Energy, PV, Diesel generator, Fuel meters, Power quality meters, Efficiency data (CO₂ and fuel savings, plant and fuel efficiency, Measurement variables taken from the project sites, Island data (Island area, population, no. of consumers, Nominal capacities, Operational data and readings, Energy, PV, Diesel generator, Fuel meters, Power quality meters, Efficiency data (CO₂ and fuel savings, plant and fuel efficiency.

Following requirements are there for a system architecture:

1. Decentralized clients are installed on the project islands

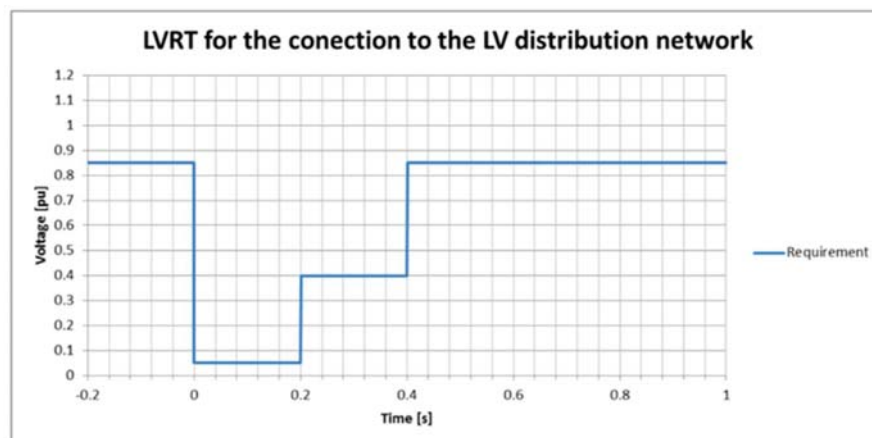
2. TCP/IP network connection between the project islands and the Central SCADA Database has to be implemented

Given its open standards in data exchange, the database is platform independent. Connection via OPC, OPC UA, DDE, ODBC, ASCII, CSV is possible – as well as the integration via of industrial standard protocols, such as Ethernet or Industrial Ethernet, or manufacturer-specific PLC protocols (e.g. iFIX, atvise). GE: Proficy iFIX, GE – Cimplicity. Certec: atvise web HMI. Schneider: InTouch. Copadata: ZenOn. USDATA: Factory Link. Axeda: Wizcon. Gossen Metrawat: ECS. ABB: Sattgraph. Universal: OPC DA/AE/HAD. OPC UA ODBC File import CSV/TXT/XML. Others can be requested. Depending on the selected communication protocol, the database interface can be adapted.

Further information will be provided at detailed engineering stage

2.4 Low-Voltage Ride Through (LVRT) requirement

The proposed solar PV plants shall contribute to overall power system stability by providing also immunity towards dynamic voltage changes. The PV generating plant shall be capable to stay connected to the low voltage network as long as the voltage at the point of connection remains above the voltage-time diagram of figure below. The voltage is relative to the nominal voltage at the point of connection. The smallest phase to phase voltage shall be evaluated. The compliance to such Low-Voltage Ride Through (LVRT) requirement shall apply to all equipment within a solar PV generating plant that might cause its disconnection. After the voltage returned to the voltage range, the pre-disturbance operating conditions (active & reactive power) shall be resumed as fast as possible and with a tolerance of $\pm 10\%$ of the generating plant rated power



2.5 On System Architecture for Type B islands

Type B islands system architecture should also provide the option to run the system where BESS is providing grid-forming capabilities (instead of grid supporting services).