



هيئة تنظيم الكهرباء - عمان
AUTHORITY FOR ELECTRICITY REGULATION, OMAN

Request for
Expressions of Interest
to provide an
Integrated System
for *SAHIM 2*
Rooftop PV Initiative



Introduction

1. The Authority for Electricity Regulation, Oman ("the Authority") invites Expressions of Interest ("EOI") from suitably qualified entities of the indicative cost of providing and operating an integrated system of automated risk management with the following non-exhaustive list of capabilities: information storage and retrieval, remote metering and monitoring of multiple rooftop PV systems, weather corrected performance evaluations, performance reports of sufficient quality to support invoicing and contract payments, high-level storage redundancy and data security, and other requirements stipulated by the Authority relevant to the life cycle management of privately financed rooftop PV system assets (collectively the "**Integrated System**").
2. The "**Integrated System**" has been identified by the Authority as the principal instrument of operational management and risk mitigation for the **SAHIM 2** rooftop PV initiative.
3. This EOI describes the **SAHIM 2** initiative and the functionality and scope of services required of the **Integrated System**. The EOI also identifies experience requirements expected of an entity the Authority will appoint to act on its behalf (the "Authority's Agent") for **SAHIM 2**. The Authority's Agent will be responsible for procuring, funding, installing, commissioning, operating and maintaining the **Integrated System** for **SAHIM 2** for period of not less than 20 years.

Minimum Experience Requirements

4. The Authority invites EOI from entities with the following experience requirements:
 - a. A track record of operating an existing proven platform managing portfolios of private sector funded domestic rooftop PV systems over full asset life cycles (experience of domestic PV is a specific requirement as opposed to industrial or utility scale solar);
 - b. A successful track record of operating a secure platform and high security data centre with high levels of redundancy and embedded data security with:
 - i. Minimum 5-years experience of delivering services with >99.99% availability;
 - ii. Minimum 5-years experience of providing metering and data collection services for portfolios of at least 1,000 domestic rooftop PV systems; and
 - iii. Minimum 5-years experience of providing performance reports and invoices for the purposes of contact settlement.
 - c. Experience and demonstrated track record of compliance management and automation capability covering fraud detection, incomplete processes, incorrect documentation, erroneous solar generation claims, etc;



- d. Operating a secure platform that supports multiple stakeholders with different permissions, roles and actions over the lifecycle of assets and generating KPI reports at regular intervals;
 - e. Experience of various PV solar technologies and systems, weather compensation and correction, performance monitoring and measurement, and KPI reporting;
 - f. Experience of private financing and contracting models for domestic rooftop PV;
 - g. Experience of monitoring O&M contracts for large portfolios of domestic rooftop PV systems;
 - h. A track record of providing in house customer support by a team with extensive experience of technical analysis and performance monitoring, with the capability to :
 - i. Remotely identify and resolve systemic equipment failure (e.g. mass failure of inverters);
 - ii. Remotely evaluate performance issues to avoid unnecessary site visits and related costs;
 - iii. Supervise commissioning tests and confirm successful completion to facilitate adoption of new compliant PV rooftop systems and compile and maintain retrievable records for each PV system component to provide complete and accurate 'asset registers' for each PV system; and
 - iv. Undertake performance audits and KPI reporting at (i) portfolio level (ii) and sub-portfolio levels.
 - i. Experience of managing sensor networks (not just meter data collection) and various communications types (not just GSM);
 - j. Demonstrated track record of reactive approach to product development, and ability to provide software releases and system enhancements as and when required; and
 - k. Have a dedicated in house team of highly experienced hardware, software, communications and algorithm developers.
5. The Authority's Agent will commit to establish a corporate presence in Oman.



Requested Information

6. Respondents to the EOI are required to provide the following:
 - a. Confirmation of the experience requirements listed above with other supporting information considered relevant to the assessment of experience;
 - b. References for asset owners and Customers for whom services are provided. The Authority will confirm references and will wish to view the operation and performance of relevant systems and services; and
 - c. An indication of the indicative cost of providing the **Integrated System** and related services outlined in the EOI with fee proposals that may take the form of:
 - i. An annual fixed charge; or
 - ii. A charge per PV system covered by the **Integrated System**; or
 - iii. A fee structure proposed by the respondent.
7. Responses to the EOI should be submitted to consultations@aer-oman.org by 6 June 2018.



SAHIM 2 Initiative

8. In May 2017 the Authority launched a series of renewable energy initiatives to better utilise Oman's abundant year-round solar resource. SAHIM, which means 'contribute' in Arabic, will drive the installation of rooftop solar panels on buildings across Oman.
9. The objectives of SAHIM include:
 - i. To **promote renewable energy** in Oman through the deployment of a clean, sustainable and efficient technology (photo voltaic) at residential and other Premises;
 - ii. To **promote demand reduction**, particularly at times of system peak demand, and thereby reduce quantities of electricity supplied from the Main Interconnected System sourced from centrally dispatched gas plant;
 - iii. To **promote distributed generation** and thereby reduce the magnitude and cost of Transmission and Distribution System losses; and
 - iv. To deliver long term **reductions in electricity subsidy**.
10. SAHIM is structured in two phases:
 - i. SAHIM 1 has already commenced and allows larger households and businesses who install rooftop PV solar systems, at their own cost, to be compensated for PV electricity exported to a licensed system at the relevant approved Bulk Supply Tariff ("BST");
 - ii. **SAHIM 2** will aim to drive the wide-scale deployment of small PV systems (3kWp – 5kWp) at between 10% to 30% of residential Premises in Oman. Unlike SAHIM 1, the costs of procuring, installing, operating and maintaining **SAHIM 2** residential PV systems will not be met by Customers but will be met by private sector entities who will recover related costs through contracts with Licensed Suppliers.
11. The costs and benefits of **SAHIM 2** were evaluated in Consultation Paper 03/2017 issued by the Authority in May 2017 (available for review on www.aer-oman.org). The general framework of **SAHIM 2** is as follows:
 - i. Private entities ("**PV System Providers**") will compete to fund, procure, install, own, operate and maintain **qualifying PV systems** at residential Premises designated by the Authority – procurement, installation and PV system operation will be closely supervised by the Authority's Agent. The performance of all **qualifying PV systems** will be independently monitored over their operational lives;
 - ii. Licensed Suppliers will enter long term performance based contracts with **PV System Providers** to remunerate investment costs (including investment returns) and the costs of installing, commissioning, operating and maintaining **qualifying PV systems**. The Authority's Agent will provide performance data to support these transactions;



- iii. Licensed Supplier costs will be eligible for inclusion in the generality of costs considered by the Authority when calculating subsidy pursuant to Article 18 of RD 78/2004. The Authority's Agent will provide performance data to support subsidy calculations;
 - iv. Participating Customers will make a Contribution to participate in **SAHIM 2** based on expected electricity bill savings. Customers will have no ownership right over **qualifying PV systems** but will benefit from lower bills over the full life of **qualifying PV systems**;
 - v. **SAHIM 2** incorporates principles successfully applied to Oman's IWPP program including private sector participation, property rights, performance incentives, and risk allocation.
12. The Authority has developed a legal, transactional and operational framework for **SAHIM 2**. The initiative will be implemented through new regulations issued pursuant to Article 38 of RD 78/2004. **PV System Providers** will be authorised by the Authority to conduct their activities.
13. Having identified key project risks and considered how best they might be managed, the Authority identified a framework of risk mitigation activities and processes to be undertaken by the Authority's Agent.



Role of Authority's Agent & System Requirements

14. The Authority's Agent will provide an **Integrated System** to facilitate the following non-exhaustive list of functions (in each case for each individual PV system):
- A. **Following confirmation of award to successful bidders:** compile and maintain a register of awarded contracts including: participating premises, number and types of PV systems, configurations of PV systems to be installed at each premise, details of PV System Providers and contractors responsible for PV System installations at specified premises and subsequent o&m;
 - B. **During installation:** monitor and register all required approvals and consents (e.g. Municipality). Confirm only approved and correct components are installed at stipulated premises and maintain a database including photographic records of installed components at each premise. Maintain complete auditable records of verified consents easily retrievable by authorised persons;
 - C. **Commissioning:** determine if PV systems can commence commissioning tests (subject to confirmation of all necessary consents and approvals);
 - D. **Commissioning phase:** monitor commissioning tests of all PV systems to confirm: complete installation of specified PV system; compliance with approved design and components; that PV system output accords with manufacturer design specifications given actual local weather conditions at time of commissioning; confirm satisfactory completion of commissioning tests or indicate why commissioning failed and actions required to retest. Confirmation that commissioning tests have been successfully completed are a condition precedent for the commencement of contract payments by Licensed Suppliers to PV System Providers;
 - E. **PV System operation:** monitor PV system performance and identify required interventions including remedial O&M. When necessary facilitate retrieval of warranties and performance guarantees. Remote download of agreed interval metering for each PV system and conduct analysis to confirm PV system performance (given local weather conditions) in respect of:
 - i. PV system availability;
 - ii. kWh output;
 - iii. PV System performance factors assessed against relevant benchmarks; and
 - iv. Statistical analyses of the performance of 'manufacturer type' components to confirm suitability for inclusion in next phase of **SAHIM 2** or otherwise to identify systematic failings;



- F. **Reporting & Settlement:** produce and circulate detailed reports to facilitate:
- i. Settlement of Licensed Supplier contracts with PV System Providers;
 - ii. Settlement of PWP contracts for Spill (if applicable);
 - iii. License Supplier / PWP analysis to confirm system demand reduction;
 - iv. Authority subsidy reporting and periodic evaluations of **SAHIM 2** to compare outturn costs and benefits against expectations (such evaluations will be critical to confirming approval to proceed with subsequent **SAHIM 2** phases).
- G. The **Integrated System** of the Authority's Agent will facilitate remote access through web-interface for the Authority, Municipalities provide installation consents, Licensees and other persons. Restrictions on access rights will be configured to specific needs of each user - in most cases this will be 'read only' with the ability to amend existing data and records in the system strictly prohibited. Web-interface access will facilitate entry (not withdrawal or cancellation) of consents and approvals.
- H. In due course the Authority's Agent may provide a 'live feed' to Licensee control rooms to facilitate monitoring of PV system output and flows (Spill) onto licensed systems.



Other Responsibilities

15. In addition to the above the Authority's Agent will work closely with the Authority's Technical Advisor on the following non exhaustive list of issues:
- i. Preparation of RfP for each stage of **SAHIM 2** including evaluations of the performance of installed PV systems against expectations;
 - ii. Preparation of approved lists of component makes and manufactures for inclusion with RfP;
 - iii. Training for persons using system terminals to ensure the functionality of the system is properly used and to its full effect.

Authority for Electricity Regulation, Oman

16 May 2018