Concept Paper
On-line Training on HOMER or Similar Software

Background:

Globally, the market for distributed energy resources (DER) and micro-grid is growing due to decreasing cost of solar PV and energy storage technologies. These types of systems have huge potential for application in villages, islands, telecom sites, hospitals, university campuses, offices, homes etc. Globally, the cost of renewable energy technologies (including solar PV and wind) has also declined by up to 90% and storage technologies by over 50%[1].

HOMER (Hybrid Optimization of Multiple Energy Resources) is the global standard for optimizing micro-grid design in all sectors, from village power and island utilities to grid-connected campuses. The HOMER micro-grid software navigates the complexities of building cost effective and reliable micro-grids that combine traditionally generated and renewable power, storage, and load management. This software evaluates different technologies on the basis of economic optimization modelling. The evaluation which includes sensitivity analysis is conducted based on factors such as available resources, size and variability of loads, equipment prices, performance of technology, grid availability, and on ground conditions.

The user feeds in technical data such as project location, electric load requirement, renewable energy type, inverter and storage technology etc. The software also requires user to give financial inputs such as discount rate, inflation rate, capital cost and O&M costs. The software runs thousands of simulations and then shows optimum results (with sensitivity analysis) for that project. The software with its cutting-edge algorithms can optimize solar, storage, and more which can help to reduce overall energy costs of a project.

Introduction:

The SAARC region has significant renewable energy resources. If properly developed, these could greatly reduce dependence on imported fuel and lower the high electricity costs. Achieving high shares of solar PV and wind generation requires energy storage, flexible generators or other measures to compensate for the variable nature of solar and wind resources. However, significant PV and wind generation can also be deployed without these measures through installation of specific combination of technologies that can best support high shares of renewables. The HOMER software with its versatility and flexibility offers a better energy solution.

This On-line training has been requested by the Government of Maldives. This activity is thus, proposed as a special project by SEC under its thematic area of "Programme to Successfully Implement Technology Transfer (POSIT)". This training shall be conducted by SEC through online mode for the SAARC professionals working in renewable energy sector. The activity shall feature presentations, interactive discussion sessions and practical exercises led by resource person(s) from

[1] Electricity Storage and Renewables: Costs and Markets to 2030, October 2017

HOMER or similar software firm. The professionals from the Member States will attend this training online from their workspace.

Objectives:

The objective of this training is to introduce the design and functionality of this software program to the professionals, and consequently to enhance their capacity on using these software programs. This online training shall provide information and tools on the key parameters of these software associated with design and simulation of Renewable Energy projects.

Major Aspects to be Covered:

This training will cover, but is not limited to the following aspects:

1. Introduction to HOMER software and its user interface.
2. Simulation-optimization-sensitivity analysis paradigm.
3. Existing options such as diesel generators and/or grid.
4. Islanded systems with multiple generators of different technologies.
5. Micro-grid control in HOMER.
6. Solar PV, wind and advanced storage options.
7. Design for high renewable penetration and grid extension.
8. Specific equipment and control strategies.
9. Thermal loads and other custom components.
10. Case studies and practical exercises etc.

Venue of the Online Training:

The Online training shall be broadcasted from the office of SEC.