

Concept Paper

SAARC Webinars on “Solar PV System Design and Simulation Using Appropriate Software”

Tuesday, April 23 and Thursday, April 25: 1000-1130 hrs Pakistan Standard time (PKT)

Background:

The quest for sustainable energy sources has become one of the biggest challenges for our time, due to the exhaustion of fossil fuels and global warming. Renewable energy sources, in particular Solar Photovoltaic technology is one of the most promising one and is expected to develop quickly than others. This requires development of Solar PV technology in a sustainable way using the best technical and economical solution.

Solar PV performance is dependent on the local climatic conditions and availability of solar radiation. The Solar radiation assessment and estimation is important for proper design of solar energy conversion systems. As the angle of incidence of sun rays fluctuates throughout the day and over the year, therefore, various parameters need to be considered for optimizing the performance. Moreover, rooftop solar modules need to be arranged in a limited space. Hence, the complexity of performing the assessment increases.

Globally, there are many professional softwares for designing Solar PV systems that allow the users to accurately analyze different configurations and to evaluate the results and identify the best possible solution. There are many softwares in the market which are extensively used by industry and researchers for designing/simulation of Solar PV systems. These softwares include extensive meteorological data for different cities and PV systems components databases, as well as general solar energy tools. These softwares are geared to meet the needs of architects, engineers, researchers and are helpful for educational training.

Introduction:

SAARC Energy Centre shall conduct two webinars of 80-90 minutes duration each, and will be aimed towards enhancing the capacity of the PV system design professionals in the SAARC region. These two webinars will cover sections with basic and intermediate level training on using the softwares. The expert(s) will demonstrate the functionality of these powerful softwares, and will help the participants understand the modeling, assessments, performance evaluation and cost estimation techniques.

Before installation of a Solar PV system, there are various design parameters which have to be considered and evaluated in the planning phase. The most important parameters include local meteorological data, critical electrical load of the building, Land area required for Solar PV panels, orientation and tilt angle of Solar PV Panels and installed capacity of total system. These parameters are difficult to be evaluated without using professional Solar PV software.

Objectives:

The objective of these webinars is to introduce the system design and simulation softwares and to enhance the capacity of the SAARC professionals on using these softwares. These webinars shall provide information and tools on the key parameters of softwares associated with design and planning of solar PV system.

Major Aspects /Topics to be covered during the Webinars:

The webinars shall cover, but not limited, to the below mentioned parameters of the softwares:

- a) Database of manufacturers
- b) Meteorological data
- c) PV array characteristics
- d) Shading effects
- e) Annual Energy Production [MWh/y]
- f) Performance Ratio of the system
- g) Capacity Factor of system
- h) PV system payback period
- i) PV system losses

Potential Professional Resource:

The expert(s) from software companies and from outside market shall be engaged during the webinars. They shall deliver their presentations during the webinars and respond to questions by the participants.

Venue of the Webinars:

The Webinars shall be broadcasted from the office of SAARC Energy Centre.