Maxx solar online academy

Solar Advanced Course – On-grid - 2MWp

Content and Learning Goals

Overview

1. Renewable energy sector update and recap
2. Software tool overview
3. Power and energy optimisation of rooftop and ground mount systems.
4. Cost and financial performance optimisation consideration
5. Practical design session

1. Renewable energy sector update and recap

Purpose/Objective: The participant is given a refresher and recap of what has been taught in the Basic course.

Learning Goal for participants: Be reminded of the key concepts of solar PV technology as shared during the Basic course and inform the participant of what their anticipated level of understanding should be.

Content:

- Status of world renewables progress
- Projections for 2030
- Latest on solar PV products
- Key aspects of solar PV modules and inverters from the intermediate course
- Financial evaluation: Time value of money, simple payback, NPV

2. Software tools overview

Purpose/Objective: Getting a broad overview of the software tools existing and being able to choose the right one depending on the requirements of the solar project and personal budget.

Learning Goal for participants: The learners will know what tools and resources are available online. Furthermore, they know which design and simulation tools to use for which application. Also, learners will know about the simulation tools that are available from specific equipment manufacturers**.**

Content:

- Solar information resources online
- Calculation and Design Tools Commercial
- Calculation and Design Tools from manufacturers

3. Power and energy optimisation of rooftop and ground mount systems.

Purpose/Objective: The participant is taken through a technical design approach for a multi-orientation solar roof and a uniform site

Learning Goal for participants: Become aware of the implications for the various choices of a technical design, be it specific yield maximisation, kWp maximisation, inter-row shading and optimisation around shading objects, PV inverter loading ratios, and cable selection.

Content:

- Maximising energy production on roofs. East/West vs North facing arrays.
- Examining the various factors that determines energy production and losses. For example, inter-row shading, Inverter loading ratio, cable diameter choice, Longer AC or DC cable runs, 1000V compared to 1500V maximum string voltage.

4. Cost and financial performance optimisation consideration

Purpose/Objective: The participants will learn about the key aspects of solar PV systems through a series of mini-case studies which highlight the financial impact on design choices and help ensure that the costing of solar PV plants can be optimised.

Learning Goal for participants: The participants will learn the financial evaluation approaches to different aspects of the design, which include pure capital cost comparison, Net Present Value comparisons as well as the use of Internal Rate of Return. Technical designs are thus supported using a cost analysis.

Content:

- Evaluation of a series of mini-case studies, including
- PV module choice given different costs
- Use of bifacial modules
- PV space limit on roofs
- Sheds vs in-plane roof-mounted PV
- DC cable cross-section to reduce V-drop losses
- PV inverter loading ratio

5. Design approach to a 2MWp ground mounted system

Purpose/Objective: The participant is presented with best practices of various aspects of a complete 2 MWp solar system design.

Learning Goal for participants: Integrate the learning from the technical and financial performance optimisation, by making design choices that are evaluated from a technical point of view (maximising kWp vs loss of specific yield) and evaluating the impact on the financial performance.

Content:

- Inverter choice
- PV modules
- Mounting structure
- DC combiner
- DC string cable management
- DC bulk cable routes in trenches
- Inverter station
- AC cables
- AC combiner box
- SLD

Practical design sessions

- Design a rooftop-based system along a set of design criteria
- Make component choices
- Maximize energy yield
- Find the lowest LCOE for different inverter loading ratios for a specific system and location.