

Selangor Human Resource Development Public Training

TITLE OF TRAINING PROGRAM

Solar PV Systems Essential

TARGET GROUP

This course is intended for people with some basic knowledge of Electricity.

OBJECTIVES

The aim of this course is to provide a good understanding of an off-grid (SAPV) and on-grid (GCPV) Solar Photovoltaic system which is used as renewable energy throughout the world. This course will help one to identify what are the basic components required to form a Solar PV system.

At the end of this course, the participants will be able to

- Have better understanding on Off-Grid and On-Grid PV systems
- Develop basic idea on designing simple Off-Grid and On-Grid PV system
- Have basic idea on fundamentals of solar irradiation and solar insolation
- Able to differentiate various kind of solar cell technologies.

TRAINING METHODOLOGY

Structured Activities

For each of the topic covered, the students are first taught the basic concepts. The principle of operation and its practical implementation are then covered.

DURATION

2 days (9am-5pm)

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TRAINING PROGRAM OUTLINE

Day 1

1. Basics of Electricity

- 1.1. Explanation of Basic Ohm's Law and Power Terminology: Resistance, Voltage, Amperes and Power
- 1.2. DC System
- 1.3. AC System
- 1.4. Comparison between AC and DC systems

2. Photovoltaics' Terminology & Connections

- 2.1. Photoelectric Effect
- 2.2. Solar cell circuit model
- 2.3. Characteristic curve: I-V curve, power curve and fill factor
- 2.4. Cells, modules & Arrays
- 2.5. STC (standard test condition)
- 2.6. NOCT (normal operating cell temperature)
- 2.7. Module efficiencies and Temperature Coefficient of Voc/Isc
- 2.8. Series or parallel connections

3. DC Solar Charge Controllers

- 3.1. PWM (pulse width modulation) Chargers
- 3.2. MPPT (maximum power point tracking) Chargers

4. DC to AC Solar Inverters

- 4.1. Off-Grid Type
- 4.2. On-Grid Type

5. Battery Storage

- 5.1. Comparison of Lead Acid versus Lithium Polymer batteries
- 5.2. DC12V, DC24V, DC36V, & DC48V

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5.3. Series / Parallel connections

5.4. Battery Sizing.

6. DC circuit breakers

6.1. Isolator Switches

6.2. MCB (main circuit breakers)

6.3. CP (circuit protectors)

6.4. Surge Protective Device (SPD)

Day 2

7. Combiner Box and Cables

8. Structures

8.1. Ground-mounted

8.2. Flat Roof

8.3. Pitched Roof (BAPV)

8.4. Building Integrated PV

9. Basics of Solar Energy

9.1. Properties of Solar Radiation

9.2. Solar Irradiation and Solar Insolation

9.3. Solar Irradiation Map

COURSE ADMINISTRATION

Date: 21-22 February 2020

Venue: SHRDC, Section 13, Shah Alam, Selangor

Fee: RM 1,908.00 per pax (Fee is inclusive SST 6%)

Please contact En Kamal for further assistance

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