**Solar Electric Technician (Level 2)**

**Module 3: Measurement of electrical and solar parameter**

**E10: Assignment - Determine solar radiation using online data**

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| **E10: ASSIGNMENT MEMO** | |
| **Date** | …. |
| **To** | Participants |
| **From** | Trainers |
| **Subject** | Determine solar radiation using online data. |
| **What** | Learn how to determine solar radiation using online data from the reliable source. |
| **Why** | The objective of the assignment is to determine and understand the solar radiation data. |
| **How** | 1. Group of 2 or 4. 2. Gather the required tools and equipment. 3. Read and carefully follow the instructions given carefully and complete the assigned task. 4. Record your findings, obtained values and any observation during the analysis. 5. Notes is also included so as to assist participants to let tally the results with the measured value or results. 6. After completing the assigned tasks, discuss your results with class and answer any related questions. |
| **Time** | 60’ |

**Task 1: List out the tools and resources available for solar radiation.**

**Answer:**

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Notes**

* PVGIS (Photovoltaic Geographical Information System) – provides free solar radiation data globally.
* SolarGIS – offers high resolution solar data and maps for many regions
* NREL’s NSRDB (National Solar Radiation Database)

**Task 2. Determine solar radiation for your current location.**

1. **Required tools/equipment**

* Laptop

1. **Instructions**

* Choose an online tool.
* Let’s use PVGIS (offers free and easy to access solar radiation data).
* Input the coordinates of the location.
* Example: Coordinates for Kathmandu = 27.7172° N, 85.3240° E
* Collect solar radiation data.
* Select the “Solar radiation” Tab: Once the location is set, choose the solar radiation option from the interface.
* Time period selection: You can select data for various time frames, such as daily, monthly, or yearly. For this example, let’s look at monthly data for a typical year.
* View data: PVGIS will generate data showing different types of solar radiation:
  + - Global horizontal irradiance (GHI): The total amount of solar radiation received per square meter on a horizontal surface.
    - Direct normal irradiance (DNI): The amount of solar radiation received per square meter on a surface that is always perpendicular to the sun's rays.
* Analyse the data.
* GHI gives a good estimate of how much solar energy a flat surface like a roof would receive.
* DNI is useful for concentrating solar power systems or for locations where panels can track the sun.

1. **Measured value**

* GHI in July: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kWh/m2/day
* DNI in July: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ kWh/m2/day

1. **Note**

* This data is applied to calculate potential energy output, size solar panels and design systems for real-world applications.