WORLD BANK GROUP

ESMAP
Energy Sector Management Assistance Program

GUIDELINE

SOLAR RESOURCE ASSESSMENT AND MAPPING

NOVEMBER 2016

1. DELIVERABLES

1.1. The vendor shall provide as final deliverables:

- 1 *ZIP folder/station storing the raw[1] measurement data
- 1 *CSV file/station storing the QC[2] measurement data
- 1 *CSV file/station with the metadata information

1.2. At the end of each month of the measurement campaign, the vendor shall prepare two files, (1) a zipped folder with the raw files and (2) a single .CSV file that will contain all the QC measurement data from the **start of the campaign** to the **current month.** Therefore, each month, the vendor shall need to re-write the zipped folder with the raw files and the *CSV file and provide an updated version of both files.

1.3. For each solar station, the vendor shall upload the three files to BOX, in a folder created for this purpose.

1.4. In the same time, the vendor shall upload the two measurement files (raw/QC) to the WBG Energydata platform (https://energydata.info) together with the metadata file. For each station, the vendor shall update the measurement files on a monthly basis with the latest versions.

1.5. The nomenclature of the files will follow the structure:

***ResourceType*-Measurements_*Country*_*NearestCity*_WB-ESMAP_Raw.zip**
***ResourceType*-Measurements_*Country*_*NearestCity*_WB-ESMAP_QC.csv**
***ResourceType*-Measurements_*Country*_*NearestCity*_WB-ESMAP_Header.csv**

1.6. The solar parameters to be recorded are specified below, in the Metadata Information section.

2. INSTRUCTIONS FOR UPLOAD

BOX

2.1. Each vendor shall receive access to a folder on Box specific to the country and resource in question where he shall upload the deliverables. At the end of each month of the measurement campaign the vendor shall upload a new version of the raw and QC files for each station, updated with the latest measurement data.

---

[1] Raw measurement data refers to the daily files produced by the data logger. If the raw data files include multiple file types, e.g. raw data files (.rwd) as well as the SDR site database (.nsd) all file types should be included.

[2] QC (Quality Controlled) data refers to data where the original values have been checked and adjusted against a series of standard quality tests, documented in the "Comments" column.

ENERGY OPEN DATA PLATFORM

2.2. The vendor shall create an account on https://energydata.info and shall receive appropriate user permissions for the upload operations from the WB project team.

2.3. The vendor shall identify the project database (created beforehand by the ESMAP team) and shall upload the raw and QC file/station as new resources together with the metadata file.

3. METADATA INFORMATION

3.1. The vendors are requested to provide the information listed below in a *CSV file for each station.

The wind measurement campaign that has generated this data was commissioned by The World Bank with funding from the Energy Sector Management Assistance Program (ESMAP). The data is made freely available under The World Bank's open data policy.									
More information at: http://www.esmap.org/RE_Mapping									
LOCATION									
Site Name	***CountryAbbrv_Resource_NearestSettlement_PartnerInstitutionAbrv*** (e.g. PK_Solar_Multan_MSNUET)								
Equipment									
Host Institution									
Elevation (m)									
Latitude (positive North, decimal degrees)									
Longitude (positive East, decimal degrees)									
TIME									
Time Zone									
Summarisation Interval	from 00:01 to 01:00 ==> 01:00 value!								
Original data temporal resolution									
SERVICE PROVIDER									
Company									
Address									
Tel									
Web									
Emails									
SENSOR SUMMARY									
Sensor manufacturer	**Height**	**Orientation**	**Sensor Type**	**Model**	**Start Date**	**End Date**	**Serial Number**	**Slope**	**Offset**

FIELDS	
time	Date and Time according to ISO8601 (YYYY-MM-DD hh:mm)
ghi_rsr	Global Horizontal Irradiance (W/m^2) from Rotating Shadowland Radiometer
dni	Direct Normal Irradiance (W/m^2)
dhi	Diffused Horizontal Irradiance (W/m^2)
air_temperature	Air Temperature (Deg C) at Xm height
relative_humidity	Relative Humidity (%) at Xm height
wind_speed	Wind Speed (m/s) at Xm height
wind_speed_of_gust	Maximum wind speed in the integration interval
wind_from_direction_st_dev	Wind direction in degrees North, counted clockwise -standard deviation
wind_from_direction	Wind direction in degrees North, counted clockwise
barometric_pressure	Mean sea level air pressure in hPa
ghi_pyr	Global Horizontal Irradiance (W/m^2) from Thermopile Pyrometer (where exists)
sensor_cleaning	1 (yes) /0 (no)
Comments[3]	
noValue	nan

[3] Column "Comments" will store wording coming from a standardized taxonomy of data exclusion types, such as: Missing Data/Erroneous/Iced/Maintenance Downtime/Suspect/Sensor Failure/etc.