GUIDELINE

WIND 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 wind mast, 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 wind 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.

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[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* (where a host institution exists) *CountryAbbrv_Resource_NearestSettlement_Province* (where there is no host, such as a field-based installation) (E.g. PK_Solar_Multan_MSNUET/ PK_Wind_DaLoan_Peshawar)
Equipment	
Host Institution	
Elevation (m)	
Latitude (positive North, decimal degrees)	
Longitude (positive East, decimal degrees)	
TIME	
Time Zone	
10 minute averaged data, computed from at least 1 Hz observations	
Original data temporal resolution	
SERVICE PROVIDER	
Company	
Address	
Tel	
Web	
Email	

SENSOR SUMMARY										
Sensor manufacturer	Height	Orientation	Sensor Type	Model	Start Date	End Date	Serial Number	Data Logger Channel	Slope	Offset

FIELDS	
time	Date and Time according to ISO8601 (YYYY-MM-DD hh:mm)
aX_wind_speed_min[3]	Min Wind Speed (m/s)
aX_wind_speed_max	Max Wind Speed (m/s)
aX_wind_speed_mean	Mean Wind Speed (m/s)
aX_wind_speed_stddev	Wind Speed (m/s) - standard deviation
dX_wind_direction_mean	Wind direction in degrees North, counted clockwise
dX_wind_direction_stddev	Wind direction in degrees North, counted clockwise-standard deviation
pX_air_pressure_mean	Mean sea level air pressure in hPa
pX_air_pressure_stddev	Mean sea level air pressure in hPa- standard deviation
hX_relative_humidity_mean	Relative Humidity (%) -mean value
hX_relative_humidity_stddev	Relative Humidity (%) -standard deviation
tX_temperature_mean	Air Temperature (Deg C)
tX_temperature_stddev	Air Temperature (Deg C)
aX_turbulence_intensity	10-minute standard deviation of the wind speed divided by the mean wind speed during that same time interval
Comments[4]	
noValue	nan

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[3] X = anemometer height (m); the entries are specific to each anemometer with X indicating its height. If two anemometers are situated at the same height, these will be differentiated by their type of sensor: T (Thies), V (Vector) or R (Risoe). E.g. **a80T_wind_speed_mean / a80V_wind_speed_mean**

[4] 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.