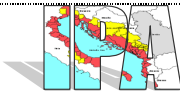





# POWERED

green energy in Adriatic sea

<b>Project Title</b>	P.O.W.E.R.E.D. - Project of Offshore Wind Energy: Research, Experimentation, Development
<b>Project Code</b>	087
<b>Programme</b>	 IPA ADRIATIC CBC PROGRAMME 2007-2013
<b>Priority</b>	2 – Natural and Cultural Resources and risk Prevention
<b>Measure</b>	2.3 – Energy saving and renewable energy resources
 Programme co-funded by the EUROPEAN UNION	

## WP 4 – Numerical and experimental evaluation of wind energy resources in the Adriatic basin

### ANNEX 4\_1 – WEATHER STATION FORM

<i>Author</i>	<i>Dissemination Level<sup>1</sup></i>	<i>Delivery Date</i>	<i>Version</i>

<sup>1</sup> Example:

**PU** = Public

**PP** = Restricted to other programme participants

**RE** = Restricted to a group specified by the consortium.

**CO** = Confidential, only for members of the consortium.



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## INTRODUCTION

This document provides a synthetic and clear view on the main features of the meteorological data source and files format. It shall be sent once, on the first transmission of documents, and eventually upgraded after any relevant alteration, such as a measurement sensor change or a different layout in data file. This form should be compiled for each Weather Station individuated and then saved in Adobe Pdf™ format (.pdf). It should be sent via e-mail at the following address:

[ricci@univpm.it](mailto:ricci@univpm.it) , [r.romagnoli@univpm.it](mailto:r.romagnoli@univpm.it) , [d.vitali@univpm.it](mailto:d.vitali@univpm.it) and [ercole.cauti@gruppometron.it](mailto:ercole.cauti@gruppometron.it)

The file name should have the syntax “XXX-NNN\_info.pdf”, where XXX-NNN is the station identification code. The station identification code is made of two parts: the first three digits are the Partner code in the project (see *Table 3*), the following three digits a progressive number. On compiling, be sure that pictures must be placed inside the relative tables to avoid align problems; the tables will resize according to picture size. You can delete the compiling examples inside the tables or add rows if necessary (by copying the existing ones).

*Table 1 Partners identification code in the Powered Project*

<b>Partner</b>	<b>Id. Code</b>
Abruzzo Region	LB
Ministry of Economy of Montenegro	B1
Veneto Agricoltura	B2
Province of Ravenna	B3
Marche Region	B4
Molise Region	B5
Apulia Region	B6
Marche Polytechnic University	B7
CETMA Consortium	B8
Micoperi marine contractors srl	B9
Italian Ministry for Environment and Land and Sea	B10
Ministry of Economy, Trade and Energy of Albania	B11
Municipality of Komiza	B12



## WEATHER STATION GENERAL INFORMATIONS

W.S. <sup>2</sup> name	TORRE METEO UNIV. ANCONA	
W.S. identification code	B7 - 001	
W.S. position (place name, address, nation, ...)	POLO DIDATTICO MONTEDAGO, VIA BRECCIE BIANCHE, ANCONA	
W.S. position (lat-long WGS84 with at least 8 digits of precision)	N 45,12345678	E 13,12345678
W.S. type	lattice wind tower	

- the weather station is governmental, from ( insert here the owner of the weather station )
- the weather station is private., from ( insert here the owner of the weather station )
- the weather station is operative from ( insert here the year or date in format DD/MM/YYYY )
- note:
- ( insert here any useful information )
- insert here images from geographical software or maps (e.g. Google Maps™ ) with the position of the W.S. highlighted.

picture 1

(please drag here the picture)

picture 2

(please drag here the picture)

---

<sup>2</sup> W.S. stands for Weather Station



## WEATHER STATION GENERAL REQUIREMENTS

- the weather station has a regular and active maintenance service from: (year)
- the weather station has meteorological data from<sup>3</sup> : (year)
- the owner is agree to give the meteorological data from the weather station for the next (year) years (10 years are welcome)
- Insert here a brief description of site and type of terrain. In particular, highlight any orographic element that could influence the weather station measurements (see the task “4.2 Setting up of the first-rate weather station network” at chapter “2 Guidelines for proper installation of the meteorological towers”).

(insert here any useful information)

- the site does not have any obstacle within 200 meters from W.S.
- the site does not have any obstacle within 100 meters from W.S.. The following obstacles are present over 100 meters distance from W.S. (see the task “4.2 Setting up of the first-rate weather station network” at chapter “2 Guidelines for proper installation of the meteorological towers”). You can delete the examples.

Table 2 Obstacles at more than 100 meters from W.S.

Type of obstacle	distance	Obstacle eighth / note	direction
single house	120 m	9 m	NNE
change of roughness	120 m	> 0.4 (grass to woodland)	SE
escarpment	180 m	15 %	S
_____	___ m	_____	__
_____	___ m	_____	__
_____	___ m	_____	__

<sup>3</sup> at least one year of available data



*Table 2 Obstacles at more than 100 meters from W.S.*

Type of obstacle	distance	Obstacle eighth / note	direction
_____	___ m	_____	__
_____	___ m	_____	__
_____	___ m	_____	__
_____	___ m	_____	__
_____	___ m	_____	__
_____	___ m	_____	__

insert here the pictures taken from the W.S. (if available, the N, NE, E, SE, S, SW, W, NW views are welcome)<sup>4</sup>.

N view

(please drag here the picture)

NE view

(please drag here the picture)

E view

(please drag here the picture)

SE view

(please drag here the picture)

S view

(please drag here the picture)

---

<sup>4</sup> The letters stand for: N = North, E = East, S = South, W = West, SE = South West and so on.



SW view

(please drag here the picture)

W view

(please drag here the picture)

NW view

(please drag here the picture)



## WEATHER STATION TECHNICAL REQUIREMENTS

- the weather station is a lattice tower of height: \_\_\_\_ meters
- the weather station is not a lattice tower. Describe the weather station type and height:  
(insert here any useful information)
- insert here images of the W. S. (if available)

picture n.3

(please drag here the picture)

picture n.4

(please drag here the picture)

picture n.5

(please drag here the picture)

- the weather station have wind speed<sup>5</sup> and direction sensor at height greater or equal to 10 meters above ground level;
- indicate the measurement instruments type, height above ground level, elaboration<sup>6</sup> period and type<sup>7</sup> present in the weather station in the *Table 3* (you can delete the example).

*Table 3 Measurements Instruments in the W.S. and their main features.*

Meteorological Variable	Instrument type	Height a.g.l.	Elaboration period (hh:mm)	Elaboration type
wind speed	cup anemometer	10 m	00: 10	Min, Ave, Max, St.dev.
wind direction	wind vane	10 m	00: 10	Ave, St.dev.

<sup>5</sup> The wind speed is the wind velocity on the horizontal plane. The vertical velocity is not taken in account.

<sup>6</sup> The elaboration period is the acquisition time interval on witch statistical elaboration, such as average value or standard deviation, are calculated. It must be 10 minutes or one hour

<sup>7</sup> The elaboration type is the statistical elaboration made on the data acquired by the instrument during the elaboration period. The main are: Min (minimum value registered), Ave (average value), Max (maximum value), Tot. (total), St.dev. (standard deviation).







## THE FILE FORMAT OF THE METEOROLOGICAL DATA

The meteorological data given by each weather station of the Powered network should be send to [ricci@univpm.it](mailto:ricci@univpm.it) , [r.romagnoli@univpm.it](mailto:r.romagnoli@univpm.it) , [d.vitali@univpm.it](mailto:d.vitali@univpm.it) and [ercole.cauti@gruppometron.it](mailto:ercole.cauti@gruppometron.it)

To avoid mistakes and facilitate the data analysis elaboration and assimilation into numerical models, it is essential to know what informations are sent and the way they are written. In this section is explained how to describe the main features of the meteorological data file taken from any Weather Station. We remember you that each file should consist of one-year data and the file name should have the syntax "XXX-NNN\_YYMMNN.txt"<sup>8</sup>. The file should be in text format (.txt), extended ASCII (8 bits encode is welcome), tab-separated value , or eventually in (.dat) format.

- The file name is: \_\_ - \_\_ - \_\_\_\_ .txt)
- The code for invalid values is (example: 999999): \_\_\_\_\_
- Indicate the time format used in the file<sup>9</sup>: \_\_\_\_\_
- The data block is standard.
- The data block is not standard: describe the structure of the data block

(insert here any useful information)\_\_\_\_\_

(insert here any useful information)\_\_\_\_\_

(insert here any useful information)\_\_\_\_\_

---

<sup>8</sup> Where XXX-NNN = weather station identification code, YY = year in two digits, MM = start month in two digits, NN = end month in two digits

<sup>9</sup> As example: MM.DD.YYYY<b>hh:mm. Pay attention to put exactly the delimiter used in the file.



- Indicate in the following table the variables header and main features in their sequential order (you can delete the example)

*Table 4 Variable header in their sequential order and main features*

Variable Header (as is in the file)	Variable Type	SI Units	Elaboration type	Data Format <sup>10</sup>	Height agl (m)
time	date and time	---	---	MM.DD.YYYY<b>hh:mm	--- m
speed 1 ds (mps)	wind speed	m/s	Average	999.99	10 m
speed 1 ds (mps)	wind speed	m/s	Standard Dev.	999.99	10 m
angle 1 (°)	wind direction	deg	Average	999	10 m
speed 2 (mps)	wind speed	m/s	Average	999.99	30 m
angle 2 (°)	wind direction	deg	Average	999	30 m
rain (mill)	rainfall	mm	Average	999	--- m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m
_____	_____	_____	_____	_____	__ m

---

<sup>10</sup> Useful to see the number of decimal digits and the decimal separation value (comma or dot) used for the variable values. The “9” is a generic number.

