Measuring-Network of Wind Energy Institutes

20PP01

Power Performance Proficiency Test

IECRE External Report_V2

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Participants identities managed by Measnet Secretariat

Contents

*This version 2 of the report explains in more detail than the previous one (released in January 2024) the process of the Proficiency Test, specially the purposes and results of Round 1 (see chapter 1). In addition, a preface by IECRE and MEASNET has been added.

Preface

IEC Conformity Assessment Systems are globally recognised as giving consumers and industry more widely the confidence that a device or system meets or exceeds international standards.

IECRE is the global system for renewable energy conformity assessment and was established in 2014. Stakeholders in the system, those delivering conformity assessment activities, have to meet exacting criteria before being approved to operate.

In IECRE we have a global network of testing laboratories —known as RETLs— who meet the criteria in ISO/IEC 17025 for best management and measurement practice. An essential element of 17025 compliance is the demonstration of competence through inter laboratory or proficiency testing. Specifically for an international system with mutual acceptance of test results and certifications, proficiency testing is an integral element fostering the mutual trust which enable acceptance. All participants within the IECRE know and have proof that the system evaluates qualification to harmonized and aligned criteria.

IECRE has been working closely with MEASNET, who is the provider of proficiency testing in the renewables sector.

IECRE and MEASNET are delighted to publish the final report for the most recent round of Power Performance proficiency testing and to make this available to all stakeholders and interested parties.

This report is the most comprehensive overview of Power Performance evaluation ever undertaken by almost every testing organization active in the renewables sector and it is hoped demonstrates that all laboratories in IECRE have proved their competence through a thorough and independent process.

We encourage the reports use in the renewables sector and welcome any comments or feedback.

Wolfram Zeitz
IECRE Executive Secretary

Alistair Mackinnon
IECRE Chair

Alejandro Martínez
MEASNET Vice Chairman

1. Introduction & Methodology

Within the framework of the MEASNET network internal quality evaluation program, the collaboration with the IECRE organization and the consideration of proficiency testing as a service offered to its customers, a Power Performance proficiency test exercise was organized and performed.

This external report is issued according to the contents described in the IECRE O.D. 551-17 [2].

Although this report has been created by the technical coordinator, the identity of the participants is handled by Measnet. Therefore section 7 has been created based on PT provider records.

1.1. Standards in Scope.

The participants performed the tasks according to the standard IEC 61400-12-1:2017 [1].

1.2. Methodology.

According to the IECRE O.D. 551-17 [2], the proficiency test was performed in two rounds.

Round 1 is conceived as a preparation phase intended to find the sources of the differences among the participants and is restricted to type A participants.

This first round results are not representative of the proficiency of the participants. The deviations are often created by the misunderstanding of the data base structure, problems with the integration of such database into the laboratories' workflow, or issues poorly explained in the first version of the PT instructions.

Also, some differences come from different interpretations of the standards. Addressing these different interpretations is the main goal of the first round and one of the biggest benefits of the IECRE proficiency testing.

Although Round 1 results are not covered in this report, the process of analyzing the calculations of different laboratories, establishing open communication among them and reaching consensus proposals to be circulated to IECRE and TC88 is an exercise whose results go beyond the qualification of the participants as competent for their activities.

The Round 1 results, materialized into Clarification Sheets circulated in IECRE and in the proposals made to TC88 for the next revisions of the standards, are arguably the most important result of these Proficiency Tests.

Round 2 is open to type A and type B participants. The Pass and Fail criteria provided in Section 3 shall be used by IECRE to determine the proficiency of the laboratories belonging to the system.

The instructions for Round 2 comply with the specifications set in [2]:

- The test data are identical in structure but significantly different from those used in Round 1.

The PT is structured in distinct, stand-alone tasks. The chunk data approach is followed to prevent deviations in one task to cascade over to subsequent tasks as would be the case for the chain data approach. In this respect, different datasets are provided for each task.

1.3. Line Choice.

The line choice is a set of instructions given to the participants explaining which options, among those valid and present in the standard, must be taken in order to improve the inter-comparability of the results.

The applied line choices are presented separately for each assessed task of the PT (see Sections 2.1 to 2.8).

2. Topics covered by the PT

The PT focused on 11 tasks which relate to the Site Calibration (calculation of flow distortion factors and their uncertainties), the Power Curve (binned table and uncertainty), the AEP calculations (measured, extrapolated and uncertainty), the Data Filtering of power curve dataset, the In-Situ Comparison of anemometers, the Terrain (complexity) Assessment and the Obstacle Evaluation.

For each task, beyond the assessed end-calculation results which determine the scope, intermediate results were requested to be reported. These are useful to facilitate the identification of the respective root causes of potential deviations of the participants results.

The tasks are described in the following sections.

2.1. Site Calibration (SC)

The quality-checked and filtered 10-min records from a site calibration campaign in highly complex terrain have been provided. All the records are valid and have to be included in the analysis provided they fall inside the given measurement sector.

The aim is to calculate the site calibration correction factors and associated uncertainties.

LINE CHOICE 1: The site calibration factors are calculated following Method-1 of Annex C of [1].

LINE CHOICE 2: The values of the uncertainty components are provided.

CLARIFICATION 1: The required wind shear calculation is based on the side-mounted control anemometer and the low-level anemometer (of the reference mast) as indicated in the second paragraph of section 7.2.8 of [1].

CLARIFICATION 2: Since it is not written explicitly in [1], the instructions stated that the filtering and binning is applied in terms of the (hub-height) wind direction measurement of the REFERENCE mast, only.

Task SC1-Calculation of site calibration correction factors: Evaluate the average wind speed ratio for each bin of the wind direction/wind shear matrix for the completed direction sectors.

Task SC2 Uncertainty Calculation of site calibration correction factors: Evaluate the site-calibration combined uncertainty [%] at 6, 10 and 14 m/s based on a given table of uncertainty components.

2.2. Power Curve (PC)

The final, filtered, valid dataset consisting of 10-min records from a power performance campaign has been provided. The Site-Correction factors have been provided based on Method-2 of Annex C, [1]. The aim is to calculate the power curve table and the uncertainties.

LINE CHOICE 1: The values of the uncertainty components are provided.

LINE CHOICE 2: The density normalization involves the pressure, air temperature and relative humidity. The pressure is adjusted from the measurement height to the hub-height. The standard refers to ISO 2533 for the height-correction of the pressure. ISO 2533 includes

equations 12 and 13 which typically lead to slightly different values. As concluded from Round 1, these deviations do not ensure compliance with the 0.1% per bin allowed deviation in the PC task. The participants were required to apply the following equation for the hub-height adjustment of the measured pressure:

$$B_{10,min,hub} = B_{10min} \exp\left[g_n(z_{baro} - hub)/RT_{10,min}\right]$$

Where g_n=9.80665 m/s^2 and R=287.05287 m^2 K^{-1} s^{-2}. It is assumed that the elevation of the reference mast base equals that of the turbine base.

When calculating the air density, the hub-height correction to the measured pressure is applied. The measured values of temperature and relative humidity do not need to be adjusted to hub-height.

LINE CHOICE 3: The assumptions for the uncertainty components are provided.

CLARIFICATION 1: The formulas E.63, E.64 of the standard are missing the method components $u_{M,shear}$, $u_{M,veer}$ etc. The participants shall include these components as required by adding terms $(c_v\, u_{M,shear})^2$, $(c_v\, u_{M,veer})^2$ under the root symbols of equations E.63 and E.64.

Task PC1- Calculation of binned Power Curve Table normalized at 1.11 kg/m^3: Evaluate the bin-average power value for each wind speed bin of the power curve table.

Task PC2 Uncertainty Calculation of binned Power Curve Table: Use the provided uncertainty assumptions to calculate the combined uncertainty values for each wind speed bin of the power curve table.

2.3. Annual Energy Production (AEP)

A detailed Power Curve Table including uncertainty components per wind speed bin has been provided. The Annual Energy Production (AEP) and its associated uncertainty is evaluated according to Sections 9.3 and E.13.20 of [1] based on the given Power Curve and Uncertainty Table.

LINE CHOICE 1: The uncertainty of AEP is calculated according to Equation E.4 of [1].

CLARIFICATION 1: The participants must apply *Corrigendum 3* of [1] with respect to an error in equation E.24 (refers to the calculation of the temperature sensitivity coefficient c_T).

Task AEP1- Calculation of measured AEP: Calculate the *AEP-measured* value for Rayleigh distributions of wind speed with an average of 4,5,.., 11 m/s.

Task AEP2- Calculation of extrapolated AEP: Calculate the *AEP-extrapolated* value for Rayleigh distributions of wind speed with an average of 4,5,.., 11 m/s.

Task AEP3- Uncertainty Calculation of AEP: Calculate the *AEP-measured* uncertainty for Rayleigh distributions of wind speed with an average of 4,5,.., 11 m/s.

2.4. Data Filtering (DF)

A measured time series of 10-min statistics from a power performance campaign has been provided for analysis with the sole purpose of assessing the data filtering process which leads to the compilation of the valid power curve dataset. The aim of the task for the participants is to demonstrate that the same records are selected for given assumptions. Quality check of records is not involved. Specific filtering conditions have been provided (e.g. turbulence, precipitation, wind direction, turbine status, ice, sample completeness).

LINE CHOICE 1: The records are selected to determine Database B (exclusion of cut-out hysteresis effects).

Task DF1- Calculation of binned-average power table: Report the number of records in each wind speed bin.

2.5. In-situ comparison (IS)

The In-Situ verification of the primary anemometer calibration calculation is performed according to Annex K of [1]. Two datasets have been provided, for the train and test period, respectively. No filtering is required except for wind speed/direction valid ranges. The wind speed filtering is done on the values of the control anemometer.

LINE CHOICE 1: The Binning Option 1 of Section K.3 of [1] shall be applied.

LINE CHOICE 2: Annex K states that the wind speed range for the test is 4 to 12 m/s. It also states that wind speed bins shall be 1 m/s-wide centred on 1.0 m/s values based on the control anemometer. This would mean that the first bin should be [3.5, 4.5) and the last [11.5,12.5). But since the data control range is 4 to 12 m/s this would mean that these two boundary bins would be half-sized bins. Three approaches would be possible, each partially in agreement with the contradictory wording of Annex K:

i. Bins 1-m/s wide covering the 4-12 m/s range, but centered around 0.5m/s values of the control anemometer, i.e. [4,5) to [11,12).
ii. Bins 1-m/s wide centered around 1.0m/s values of the control anemometer expanding beyond the 4-12 m/s range, i.e. [3.5, 4.5) to [11.5,12.5).
iii. Bins covering the 4-12 m/s range, centered around 1.0m/s values of the control anemometer, but the width of the first and last bin is truncated to 0.5 m/s, i.e. [4.0, 4.5) ,[4.5,5.5),…,[10.5, 11.5), [11.5,12).

The Line Choice for the PT is Option (i).

LINE CHOICE 3: When calculating the regression parameters from the first period of data, there are two possible approaches: either use all data or use the bin-averaged wind speed values. The participants should apply the ALL-DATA approach.

LINE CHOICE 4: An obvious error has been identified on page 200 of [1]:

The standard writes: “Calculate the standard uncertainty of wind speed differences (statistical deviation) of the estimated primary anemometer and the measured primary anemometer wind speeds for each wind speed bin. The standard uncertainty of the wind speed differences is the standard deviation of wind speed differences divided by the square root of the number of measured data points. The standard uncertainty is”:

$$\sigma = \frac{\sqrt{\frac{\sum (V_{\text{primary\_est}} - V_{\text{primary}})^2}{n}}}{\sqrt{n}} \qquad \text{(K.4)}$$

The equation in incorrect, as it contradicts what is described in the text and it is mathematically wrong. The correct equation which is applied for the PT test is:

$$\sigma = \frac{\sqrt{\frac{\sum (V_{primary,est} - V_{primary} - \gamma)^2}{n-1}}}{\sqrt{n}}$$

where γ is as defined by equation K.3 of the standard.

Task IS1- Perform the In-Situ test: Calculate the "expanded" deviation value δ per wind speed bin of the 4-12 m/s range.

2.6. Terrain Assessment (TA)

A digital terrain-elevation file (x,y,z) has been provided for a given configuration of Reference Mast and Test Turbine. The aim of the test is to verify the terrain complexity calculations performed according to Annex B of [1].

CLARIFICATION 1: Consider that no other turbines or obstacles exist. Coordinate system arbitrary (but orthogonal).

Task TA1- Perform the Terrain Assessment: Calculate the terrain evaluation for maximum slope and maximum terrain variation from plane for the Test Turbine and Reference Mast surroundings for each of the distance ranges of Table B.1 of [1].

2.7. Obstacles Evaluation (OBS)

Coordinates for a given configuration of Reference Mast and Test Turbine have been provided with respect to a Power Curve test. The locations and characteristics of operational, parked turbines and obstacles have also been given.

The aim of the task is to evaluate the measurement sector based on the assessment of neighbouring operating wind turbines, parked wind turbines and obstacles according to Annex A of [1].

Task OBS1- Measurement Sector Calculation: Calculate the start-end of all valid measurement sectors for the Power Curve Test configuration.

2.8. General guidelines

Any binning of x-parameter is performed and reported in the [x1, x2) format, unless otherwise explicitly stated.

Some tasks are supplemented by informative sub-tasks or side-calculations which shall be also executed by the participants. The respective tables in the worksheets are clearly distinguished from the "basic" and the "intermediate" results by appropriate indication.

3. Pass / Fail Criteria

The RETLs belonging to IECRE must fulfil the following pass and fail criteria in order to be part of the IECRE system. These criteria are not mandatory for other participants.

Round 1 has successfully served the purpose to identify the root causes of the differences between the laboratories, as might be attributed to:

- Standards unclear.
- Proficiency Test guidance documents unclear.
- Mistakes or misinterpretations from the participants.

3.1. Per Task

The plausibility of the pass/fail criteria per task as initially determined has been **verified** from the analysis of Round 1 results. They are detailed below.

Pass / Fail Criteria for SC1- Calculation of wind speed ratios			
The median value of the wind speed ratio shall be calculated in each cell of the sector/shear matrix considering only the COMPLETED sectors. Additionally, for each of these cells, the Z-score (deviation from the median value divided by the standard deviation) of each participant is calculated.			
Result:	GREEN	YELLOW	RED
	Deviation ≤ 0.001 from the median OR Z ∈ (0,1] in ALL the tested cells	**Deviation > 0.001 from the median AND Z ∈ (1,3] in one or more of the tested cells**	**Deviation > 0.001 from the median AND Z ∈ (3, ∞] in one or more of the tested cells**

Pass / Fail Criteria for SC2 - Combined SC uncertainty			
The median value of the combined uncertainty (% of wind speed) shall be calculated at 6, 10 and 14 m/s. Additionally, for each of the 3 wind speeds, the Z-score (deviation from the median value divided by the standard deviation) of each participant is calculated.			
Result:	GREEN	YELLOW	RED
	Deviation ≤ max{10% of median; 0.1%} OR Z ∈ (0,1] in ALL the tested speeds	**Deviation > max{10% of median; 0.1%} AND Z ∈ (1,3] in one or more of the tested speeds**	**Deviation > max{10% of median; 0.1%} AND Z ∈ (3,∞) in one or more of the tested speeds**

Pass / Fail Criteria for PC1- Calculation of binned power values in power curve table			
The group median value of the bin-averaged power value P_n in each bin with nominal centre value ≥ 3 m/s is calculated. The allowed deviation per bin is max{1 kW; 0.001 x P_n}.			
Result:	GREEN	YELLOW	RED
	Deviation ≤ max{1 kW; 0.1% x Pn} in all bins ≥ 3 m/s		**Deviation > max{1 kW; 0.1% x Pn} in one or more bins ≥ 3 m/s**

Pass / Fail Criteria for PC2 - Calculation of combined power uncertainty in power curve table			
The bin-averaged combined uncertainty of the power value [kW] will be calculated for each wind speed bin. The group median value of the bin combined uncertainty (type A and type B) is calculated for each wind speed bin with nominal centre value ≥ 3 m/s. Additionally, for each wind speed bin, the Z-score (deviation from the median value divided by the standard deviation) of each participant is calculated.			
Result:	GREEN	YELLOW	RED
	Deviation ≤ 10% of the median OR Z ∈ (0,1] in ALL wind speed bins ≥ 3 m/s	**Deviation > 10% of the median AND Z ∈ (1,3] in one or more wind speed bins ≥ 3 m/s**	**Deviation > 10% of the median AND Z ∈ (3,∞) in one or more wind speed bins ≥ 3 m/s**

Pass / Fail Criteria for AEP1 and AEP2 - Calculation of AEP-measured & AEP-extrapolated			
The group median value of *AEP-measured* and *AEP-extrapolated* will be calculated for each of the Rayleigh distributions with average 4,5,6,…, 11 m/s.			
Result:	GREEN	YELLOW	RED
	Deviation ≤ 0.1% of median at 6,7,…11 m/s AND Deviation ≤ 0.2% of median at 4 and 5 m/s.		**Deviation > 0.1% of median in any distribution at 6,7,… 11 m/s OR Deviation > 0.2% of median in any distribution 4 and 5 m/s.**

Pass / Fail Criteria for AEP3- Calculation of AEP-measured uncertainty			
The group median value for the uncertainty of *AEP-measured* will be calculated for each of the Rayleigh distributions with average 4,5,6,…, 11 m/s. Additionally, for each distribution, the Z-score (deviation from the median value divided by the standard deviation) of each participant is calculated.			
Result:	GREEN	YELLOW	RED
	Deviation ≤ 10% of the median OR Z ∈ (0,1] in ALL distributions	**Deviation > 10% of the median AND Z ∈ (1,3] in one or more distributions**	**Deviation > 10% of the median AND Z ∈ (3,∞) in one or more distributions**

Pass / Fail Criteria for DF1 – Data Filtering			
The group median value of the number of records inside each wind speed bin is calculated for bins 6-50 (nominal bin centre value 3 m/s to 25 m/s).			
Result:	**GREEN**	**YELLOW**	**RED**
	Deviation ≤ 1 record for all bins between 3 and 25 m/s	Deviation between 2 and 3 records for any bin between 3 and 25 m/s	Deviation > *3* records in any bin between 3 and 25 m/s

Pass / Fail Criteria for IS1 – In Situ Comparison			
The deviation of the δ-value from the group median is calculated for each of the wind speed bins.			
Result:	**GREEN**	**YELLOW**	**RED**
	Deviation ≤ 0.01 m/s for all wind speed bins	Deviation > 0.01 m/s in one wind speed bin	Deviation > 0.01 m/s in two or more wind speed bins

Pass / Fail Criteria for TA1 – Terrain Assessment		
The deviation from the group median shall be based on the Z-score metric of each participant. This is defined as the deviation from the median divided by the standard deviation. The acceptance limit is Z ≤ 2. The Z-score is calculated for each of the slope/max deviation values in each of the distance circles.		
Result:	**GREEN**	**YELLOW**
	$Z \in (0,2]$ in all results	$Z \in (2,\infty)$ in one or more results

Pass / Fail Criteria for OBS1 – Calculation of Measurement Sector – Obstacles evaluation			
The deviation from the group median is calculated for each of the start/end values of the final measurement sector.			
Result:	**GREEN**	**YELLOW**	**RED**
	Deviation ≤ *0.1 deg* for all values	Deviation (0.1, 0.2] deg *in any* value	Deviation > *0.2 deg* in *any* value

3.2. Global Participant Evaluation for the Proficiency Test

The individual target limits for each of the assessed tasks presented in the previous section are combined to determine the PT result for each participant.

Three categories of rules are defined:

A. Tasks where a hard limit (target) is used, and no yellow level is applied. The exceedance of the hard limit leads automatically to RED level for the particular task.

B. Tasks where a hard limit (target) is used in combination with a Z-score metric (deviation from the median divided by the standard deviation). Applies mainly to Non-Normative Context of the IEC 61400-12-1, Ed.2, in particular uncertainty calculations. The GREEN level is achieved by complying EITHER to the hard limit OR to a strict Z-score ≤ 1. The YELLOW level is achieved when the Z-score lies between 2 and 3. Otherwise, RED level is reached.

C. For the terrain task no red level has been defined, since it is considered that a fail in this task should not directly imply a fail result in the Proficiency Test.

The Decision Rules are:

- The result of a participant is PASS if the GREEN LEVEL has been achieved in all the tasks OR the YELLOW LEVEL has been reached in up to 3 tasks.
- The result of a participant is FAIL if the RED LEVEL has been reached in any task.
- The result of a participant is FAIL if the YELLOW LEVEL has been reached in more than 3 tasks.

The Decision Rules are illustrated in the following table:

<table>
<tr><th></th><th>PASS</th><th>PASS
(correction plan advised)</th><th>FAIL
(correction plan according to section 6.1.5 of [4]</th></tr>
<tr><td rowspan="3">FINAL PARTICIPANT RESULT</td><td rowspan="3">All results are GREEN</td><td rowspan="3">Up to 3 (inclusive) results are YELLOW</td><td>One or more results are RED</td></tr>
<tr><td>OR</td></tr>
<tr><td>More than 3 results are YELLOW</td></tr>
</table>

All results in the YELLOW level should be explained in a deviation report.

An RETL participant that has failed the PT is entitled to initiate a Correction Phase according to [2].

4. Participant List

The participants enlisted for Round 1 & Round 2 (type A participants) are (in alphabetical order):

Testing Laboratory
ArcVera Renewables
Aresse Engineering S.L.
Barlovento Recursos Naturales S.L.
Beijing CGC Certification Center Co., Ltd.
China Classification Society Certification Company Ltd. (CCSC)
China Electric Power Research Institute - CEPRI
COWI A/S
CRES
Deutsche WindGuard Consulting GmbH
DNV Energy Systems Germany GmbH
DNV Energy USA, Inc.
DTU Wind and Energy Systems, Technical University of Denmark. “Wind Turbine Test”, Test and Calibration (TAC)
Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.
GL Garrad Hassan Iberica (DNV)
International Wind Engineering (IWE)
Shangai SERCAL New Energy Technology Co. Ltd
TNO Energy Transition
UL International GmbH
Wind-consult Ingenieurgesellschaft für umweltschonende Energiewandlung mbH
Windtest Grevenbroich GmbH
Wood Group UL Ltd.

Participants registered for Round 2 only (type B participants):

Testing Laboratory
Anonymous laboratory[1]
DEKRA Industrial
DNV Australia
INEGI
LME Circe
National Institute of Wind Energy
Vestas
Xinjang GOLDWIND Science & Technology Co., Ltd.

[1] This laboratory has not granted MEASNET permission to display its name on this list.

5. Proficiency Test Calendar

The following calendar describes the process of the Proficiency Test:

Preparation:

Application period deadline for Round 1	29.10.2021
Election of coordinator & participation appeals	29.10.2021 to 12.11.2021
Fees payment deadline for Round 1 participants	05.11.2021

Round 1:

	Planned	Actual
Round 1 Instructions delivery	19.11.2021	19.11.2021
Round 1 results submission deadline	14.01.2022	14.01.2022
Round 1 data analysis from conductor	17.01.2022 to 04.02.2022	26.01.2022
Round 1 results discussion	07.02.2022 to 18.02.2022	18.02.2022

Round 2:

	Planned	Actual
Application period deadline for Round 2	18.02.2022	
Fees payment deadline for Round 2 participants	25.02.2022	
Round 2 Instructions delivery	28.02.2022	28.02.2022
Round 2 results submission deadline	01.04.2022	01.04.2022
Round 2 data analysis from conductor	04.04.2022 to 29.04.2022	11.04.2022
Round 2 results communication & room for non-technical corrections	02.05.2022 to 06.05.2022	12.04.2022 to 29.04.2022
Round 2 participants final report creation	09.05.2022 to 20.05.2022	04 to 11.08.2022
Final results publication deadline	20.05.2022	

6. Results provided by the participants

The following sections 6.1 to 6.11 include tables with all the tasks, and the results of each participant. The results are presented in separate tables for type A and type B participants.

The statistics for each task are first presented for all participants within each group and then re-evaluated based on the successful participants only.

The reference (consensus) values per task are based on the median value of the group of A-participants.

The pass/fail rules are applied to determine the task result for each participant. Section 6.12 combines the tasks results of each participant, applies the decision rules of Section 3.2, and concludes on the PT result of each participant.

6.1. Site Calibration –Task SC1

All the participants provided results for Task SC1. The assessment is based on the calculated wind speed ratios of the completed cells (number of records ≥3) inside the specified three wind direction bins. The number and identity of these cells is 35 according to all type A participants. Therefore, the number of assessed results is 35.

The median value is based on the results of all type A participants. No outliers found.

The results of 19/21 of the participants type A group were identical and formed the median value. The deviating results of participants 3844 and 6857 are equal to each other, indicating that they have mis-interpreted the instructions and/or the IEC standard [1]. The deviation is attributed to the use of the reference mast speed instead of the turbine mast speed for selecting the SC database in the 4-16 m/s range.

The median values of type B participants are identical to those of type A.

PARTICIPANTS TYPE A GROUP STATISTICS for Task SC1 – Calculation of wind speed ratios							
Wind shear bins		Wind direction bins Median wind speed ratio			Wind direction bins Std.Dev. of wind speed ratio		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[-0.175,-0.125)	-0.15	1.0380	1.0751	1.0950	0.0055	0.0104	0.0306
[-0.125,-0.075)	-0.10	0.9968	1.0399	1.0682	0.0050	0.0034	0.0067
[-0.075,-0.025)	-0.05	1.0175	1.0114	1.0260	0.0053	0.0021	0.0036
[-0.025,0.025)	0.00	1.0117	0.9998	1.0080	0.0028	0.0022	0.0001
[0.025,0.075)	0.05	1.0032	1.0034	1.0108	0.0022	0.0017	0.0010
[0.075,0.125)	0.10	1.0165	1.0054	1.0081	0.0016	0.0010	0.0010
[0.125,0.175)	0.15	1.0123	1.0045	1.0083	0.0007	0.0006	0.0011
[0.175,0.225)	0.20	1.0189	1.0143	1.0059	0.0004	0.0012	0.0036
[0.225,0.275)	0.25	1.0137	1.0143	1.0161	0.0010	0.0009	0.0047
[0.275,0.325)	0.30	1.0265	1.0338	1.0697	0.0000	0.0030	0.0000
[0.325,0.375)	0.35	1.0199	0.9882	1.0136	0.0037	0.0028	0.0214
[0.375,0.425)	0.40	1.0154	n.a.	1.0654	0.0000	n.a.	0.0194

PARTICIPANTS TYPE B GROUP STATISTICS for Task SC1 – Calculation of wind speed ratios							
Wind shear bins		Wind direction bins Median wind speed ratio			Wind direction bins Std.Dev. of wind speed ratio		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[-0.175,-0.125)	-0.15	1.0380	1.0751	1.0950	0.0146	0.0271	0.0374
[-0.125,-0.075)	-0.10	0.9968	1.0399	1.0682	0.0079	0.0117	0.0125
[-0.075,-0.025)	-0.05	1.0175	1.0114	1.0260	0.0071	0.0074	0.0051
[-0.025,0.025)	0.00	1.0117	0.9998	1.0080	0.0044	0.0056	0.0063
[0.025,0.075)	0.05	1.0032	1.0034	1.0108	0.0057	0.0028	0.0050
[0.075,0.125)	0.10	1.0165	1.0054	1.0081	0.0022	0.0011	0.0023
[0.125,0.175)	0.15	1.0123	1.0045	1.0083	0.0011	0.0018	0.0018
[0.175,0.225)	0.20	1.0189	1.0143	1.0059	0.0019	0.0048	0.0056
[0.225,0.275)	0.25	1.0137	1.0143	1.0161	0.0032	0.0083	0.0105
[0.275,0.325)	0.30	1.0265	1.0338	1.0697	0.0150	0.0146	0.0307
[0.325,0.375)	0.35	1.0199	0.9882	1.0136	0.0220	0.0246	0.0528
[0.375,0.425)	0.40	1.0154	n.a.	1.0654	0.0411	n.a.	0.0575

The outcome of the Task is based on the combination of two criteria. The primary criterion is based on a maximum allowed deviation of 0.001 with respect to the median value of the wind speed ratio. This must be fulfilled for all the 35 assessed values. If the primary criterion is violated in one or more cells, then the participant is evaluated with the secondary one for the violated cells (in orange color below). The secondary criterion is based on the z-score, i.e. it considers the deviation from the median based on the dispersion (standard deviation) of the participants' results.

PARTICIPANTS TYPE A RESULTS for Task SC1 – Calculation of wind speed ratios										
		Deviation from median ALL PARTICIPANTS except for 3844 & 6857			Deviation from median for participants 3844 & 6857			z-score results for 3844 & 6857 to decide PASS/FAIL according to the secondary criterion		
Wind shear bins		Wind direction bins			Wind direction bins			Wind direction bins		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[-0.175,-0.125)	-0.15	0	0	0	0.019	0.035	0.104	3.407	3.407	3.407
[-0.125,-0.075)	-0.10	0	0	0	0.017	0.012	0.023	3.407	3.407	3.407
[-0.075,-0.025)	-0.05	0	0	0	0.018	0.007	0.012	3.407	3.407	3.406
[-0.025,0.025)	0.00	0	0	0	0.009	0.007	0.000	3.406	3.406	
[0.025,0.075)	0.05	0	0	0	0.007	0.006	0.003	3.407	3.405	3.407
[0.075,0.125)	0.10	0	0	0	0.005	0.004	0.003	3.406	3.407	3.404
[0.125,0.175)	0.15	0	0	0	0.002	0.002	0.004	3.403	3.409	3.408
[0.175,0.225)	0.20	0	0	0	0.001	0.004	0.012		3.407	3.407
[0.225,0.275)	0.25	0	0	0	0.004	0.003	0.016	3.408	3.408	3.407
[0.275,0.325)	0.30	0	0	0	0.000	0.010	0.000		3.406	
[0.325,0.375)	0.35	0	0	0	0.013	0.010	0.073	3.406	3.406	3.407
[0.375,0.425)	0.40	0	n.a.	0	0.000	n.a.	0.066		n.a.	3.406
TASK RESULT		GREEN	GREEN	GREEN	Decision to be based on the z-score (see next 3 columns) for each of the orange cells.			RED	RED	RED

PARTICIPANTS TYPE A, DECISION FOR TASK SC1: Calculation of wind speed ratios		
0536	PASS	Zero deviation from median for all results
2546	PASS	Zero deviation from median for all results
3652	PASS	Zero deviation from median for all results
3844	FAIL	Deviation > 0.001 from median for 30/35 results. Z-score > 3 for all the violated 30 results.
4394	PASS	Zero deviation from median for all results
4680	PASS	Zero deviation from median for all results
4709	PASS	Zero deviation from median for all results
5143	PASS	Zero deviation from median for all results
5481	PASS	Zero deviation from median for all results
5503	PASS	Zero deviation from median for all results
6300	PASS	Zero deviation from median for all results
6857	FAIL	Deviation > 0.001 from median for 30/35 results. Z-score > 3 for all the violated 30 results.
6974	PASS	Zero deviation from median for all results
8418	PASS	Zero deviation from median for all results
8547	PASS	Zero deviation from median for all results
9254	PASS	Zero deviation from median for all results
9297	PASS	Zero deviation from median for all results
9398	PASS	Zero deviation from median for all results

PARTICIPANTS TYPE A, DECISION FOR TASK SC1: Calculation of wind speed ratios		
9648	PASS	Zero deviation from median for all results
9962	PASS	Zero deviation from median for all results
9974	PASS	Zero deviation from median for all results

The table below provides the statistics for the 19 successful participants from Group A:

PARTICIPANTS TYPE A GROUP STATISTICS for Task SC1 – Calculation of wind speed ratios ONLY SUCCESSFUL PARTICIPANTS (19/21)							
Wind shear bins		Wind direction bins Median wind speed ratio			Wind direction bins Std.Dev. of wind speed ratio		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[-0.175,-0.125)	-0.15	1.0380	1.0751	1.0950	0	0	0
[-0.125,-0.075)	-0.10	0.9968	1.0399	1.0682	0	0	0
[-0.075,-0.025)	-0.05	1.0175	1.0114	1.0260	0	0	0
[-0.025,0.025)	0.00	1.0117	0.9998	1.0080	0	0	0
[0.025,0.075)	0.05	1.0032	1.0034	1.0108	0	0	0
[0.075,0.125)	0.10	1.0165	1.0054	1.0081	0	0	0
[0.125,0.175)	0.15	1.0123	1.0045	1.0083	0	0	0
[0.175,0.225)	0.20	1.0189	1.0143	1.0059	0	0	0
[0.225,0.275)	0.25	1.0137	1.0143	1.0161	0	0	0
[0.275,0.325)	0.30	1.0265	1.0338	1.0697	0	0	0
[0.325,0.375)	0.35	1.0199	0.9882	1.0136	0	0	0
[0.375,0.425)	0.40	1.0154	n.a.	1.0654	0		0

The following tables relate to type-B participants:

PARTICIPANTS TYPE B RESULTS for Task SC1 – Calculation of wind speed ratios													
		Deviation from median for Participants 3755, 3856, 5492, 8069 and 8610			Deviation from median for participant 3542			Deviation from median for participant 5417			Deviation from median for participant 8376		
Wind shear bins		Wind direction bins			Wind direction bins			Wind direction bins			Wind direction bins		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[-0.175,-0.125)	-0.15	0	0	0	0.019	0.035	0.104	0.043	0.080	0.063	0.001	0.029	0.003
[-0.125,-0.075)	-0.10	0	0	0	0.017	0.012	0.023	0.020	0.035	0.033	0.006	0.002	0.002
[-0.075,-0.025)	-0.05	0	0	0	0.018	0.007	0.012	0.015	0.023	0.008	0.007	0.002	0.003
[-0.025,0.025)	0.00	0	0	0	0.009	0.007	0.000	0.008	0.014	0.019	0.003	0.002	0.002
[0.025,0.075)	0.05	0	0	0	0.007	0.006	0.003	0.014	0.005	0.013	0.003	0.002	0.004
[0.075,0.125)	0.10	0	0	0	0.005	0.004	0.003	0.003	0.000	0.006	0.000	0.000	0.002
[0.125,0.175)	0.15	0	0	0	0.002	0.002	0.004	0.002	0.005	0.004	0.001	0.001	0.004
[0.175,0.225)	0.20	0	0	0	0.001	0.004	0.012	0.006	0.014	0.012	0.000	0.001	0.003
[0.225,0.275)	0.25	0	0	0	0.004	0.003	0.016	0.009	0.025	0.028	0.002	0.002	0.005
[0.275,0.325)	0.30	0	0	0	0.000	0.010	0.000	0.045	0.045	0.088	0.002	0.008	0.019
[0.325,0.375)	0.35	0	0	0	0.013	0.010	0.073	0.067	0.075	0.153	0.002	0.004	0.000
[0.375,0.425)	0.40	0		0	0.000	n.a.	0.066	0.123	n.a.	0.171	0.006	n.a.	0.000
TASK RESULT		GREEN	GREEN	GREEN	Decision to be based on the z-score (see next table) for each of the orange cells.			Decision to be based on the z-score (see next table) for each of the orange cells.			Decision to be based on the z-score (see next table) for each of the orange cells.		

The type-B participants 3542, 5417 and 8376 have failed the primary criterion in 31, 34 and 26/35 results, respectively. They are assessed with the z-score criterion for these results, according to the following table.

PARTICIPANTS TYPE B RESULTS for Task SC1 – Calculation of wind speed ratios z-score results for 3542, 5417 and 8376 to decide PASS/FAIL according to the secondary criterion										
		3542			5417			8376		
Wind shear bins		Wind direction bins			Wind direction bins			Wind direction bins		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[-0.175,-0.125)	-0.15	3.4	3.4	3.4	7.9	7.7	2.1		2.8	0.1
[-0.125,-0.075)	-0.10	3.4	3.4	3.4	4.0	10.2	4.9	1.1	0.6	0.2
[-0.075,-0.025)	-0.05	3.4	3.4	3.4	2.8	10.7	2.1	1.3	0.8	0.8
[-0.025,0.025)	0.00	3.4	3.4	3.4	2.8	6.5	129.7	1.1	0.8	15.0
[0.025,0.075)	0.05	3.4	3.4	3.4	6.5	2.8	13.5	1.4	0.9	4.6
[0.075,0.125)	0.10	3.4	3.4	3.4	2.0		5.6			2.1
[0.125,0.175)	0.15	3.4	3.4	3.4	2.4	9.3	3.4			3.9
[0.175,0.225)	0.20		3.4	3.4	14.1	12.2	3.4			0.8
[0.225,0.275)	0.25	3.4	3.4	3.4	8.8	29.4	6.0	1.8	2.5	1.0
[0.275,0.325)	0.30		3.4		>>3	15.0	>>3	>>3	2.7	>>3
[0.325,0.375)	0.35	3.4	3.4	3.4	18.0	26.2	7.1	0.6	1.3	
[0.375,0.425)	0.40		n.a.	3.4	>>	n.a.	8.8	>>3		
TEST RESULT		RED	RED	RED	RED	RED	RED	RED	YELLOW	RED

PARTICIPANTS TYPE B, DECISION FOR TASK SC1: Calculation of wind speed ratios		
3542	FAIL	Deviation > 0.001 from median for 31/35 results. Z-score > 3 for all the violated 31 results.
3755	PASS	Zero deviation from median for all results
3856	PASS	Zero deviation from median for all results
5417	FAIL	Deviation > 0.001 from median for 34/35 results. Z-score > 3 for all the violated 34 results.
5492	PASS	Zero deviation from median for all results
8069	PASS	Zero deviation from median for all results
8376	FAIL	Deviation > 0.001 from median for 26/35 results. Z-score > 3 for six (6) of the violated 26 results.
8610	PASS	Zero deviation from median for all results

The table below provides the statistics for the 5 successful participants from Group B:

PARTICIPANTS TYPE B GROUP STATISTICS for Task SC1 – Calculation of wind speed ratios ONLY SUCCESSFUL PARTICIPANTS (5/8)							
Wind shear bins		Wind direction bins Median wind speed ratio			Wind direction bins Std.Dev. of wind speed ratio		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[-0.175,-0.125)	-0.15	1.0380	1.0751	1.0950	0	0	0
[-0.125,-0.075)	-0.10	0.9968	1.0399	1.0682	0	0	0
[-0.075,-0.025)	-0.05	1.0175	1.0114	1.0260	0	0	0
[-0.025,0.025)	0.00	1.0117	0.9998	1.0080	0	0	0
[0.025,0.075)	0.05	1.0032	1.0034	1.0108	0	0	0
[0.075,0.125)	0.10	1.0165	1.0054	1.0081	0	0	0
[0.125,0.175)	0.15	1.0123	1.0045	1.0083	0	0	0

PARTICIPANTS TYPE B GROUP STATISTICS for Task SC1 – Calculation of wind speed ratios ONLY SUCCESSFUL PARTICIPANTS (5/8)							
Wind shear bins		Wind direction bins Median wind speed ratio			Wind direction bins Std.Dev. of wind speed ratio		
Range	Center	[25,35)	[35,45)	[45,55)	[25,35)	[35,45)	[45,55)
[0.175,0.225)	0.20	1.0189	1.0143	1.0059	0	0	0
[0.225,0.275)	0.25	1.0137	1.0143	1.0161	0	0	0
[0.275,0.325)	0.30	1.0265	1.0338	1.0697	0	0	0
[0.325,0.375)	0.35	1.0199	0.9882	1.0136	0	0	0
[0.375,0.425)	0.40	1.0154	n.a.	1.0654	0	n.a.	0

6.2. Site Calibration –Task SC2

All the participants provided results for Task SC2, except for 8610 (type B participant). The assessment is based on the calculated combined uncertainty [%] at 6 m/s, 10 m/s and 14 m/s. Therefore, the number of assessed results is 3.

The median value is based on the results of all type A participants. No outliers found.

The median values of type B participants differ from those of type A. The statistics provided have excluded the results of 8376 which are obviously implausible.

	PARTICIPANTS TYPE A GROUP STATISTICS for Task SC2 - Combined SC uncertainty					PARTICIPANTS TYPE B GROUP STATISTICS for Task SC2 - Combined SC uncertainty				
Wind speed	Median [%]	Min [%]	Max [%]	Std Dev [%]	Deviation limit from median [%]	Median [%]	Min [%]	Max [%]	Std Dev [%]	Deviation from median of Type A [%]
6 m/s	2.53	2.18	2.71	0.11	0.253	2.68	2.52	2.71	0.08	0.15
10 m/s	1.88	1.62	2.01	0.08	0.188	2.00	1.88	2.02	0.06	0.12
14 m/s	1.62	1.40	1.73	0.07	0.162	1.73	1.61	1.73	0.06	0.11

The outcome of the task is based on the combination of two criteria. The primary criterion is based on a maximum allowed deviation of 10% from the median value of the combined uncertainty at 6, 10 and 14 m/s. This must be fulfilled for all the 3 assessed values. If the primary criterion is violated in one or more test-speeds, then the participant is evaluated with the secondary criterion for the violated test-speed. The secondary criterion is based on the z-score, i.e. it considers the deviation from the median based on the dispersion (standard deviation) of the participants' results.

	PARTICIPANTS TYPE A RESULTS for Task SC2 – Combined SC uncertainty						
	Combined SC uncertainty [%]			Deviation of participant from median value [%] Limit: 0.253, 0.188, 0.162			
	6 m/s	10 m/s	14 m/s	6 m/s	10 m/s	14 m/s	TASK RESULT
0536	2.51	1.87	1.61	-0.02	-0.01	-0.01	GREEN
2546	2.52	1.88	1.62	-0.01	0.00	0.00	GREEN
3652	2.71	2.01	1.73	0.18	0.13	0.11	GREEN
3844	2.52	1.88	1.61	-0.01	0.00	-0.01	GREEN
4394	2.53	1.88	1.62	0.00	0.00	0.00	GREEN
4680	2.53	1.88	1.62	0.00	0.00	0.00	GREEN
4709	2.53	1.88	1.62	0.00	0.00	0.00	GREEN
5143	2.52	1.88	1.61	-0.01	0.00	-0.01	GREEN
5481	2.71	2.01	1.73	0.18	0.13	0.11	GREEN
5503	2.18	1.62	1.40	-0.35	-0.26	-0.22	RED: The z-score is 3.1, 3.2 and 3.1
6300	2.51	1.87	1.61	-0.02	-0.01	-0.01	GREEN
6857	2.52	1.88	1.61	-0.01	0.00	-0.01	GREEN
6974	2.51	1.87	1.61	-0.02	-0.01	-0.01	GREEN
8418	2.66	1.95	1.65	0.13	0.07	0.03	GREEN
8547	2.71	2.01	1.73	0.18	0.13	0.11	GREEN
9254	2.53	1.88	1.62	0.00	0.00	0.00	GREEN
9297	2.53	1.84	1.55	0.00	-0.04	-0.07	GREEN
9398	2.53	1.89	1.62	0.00	0.01	0.00	GREEN
9648	2.53	1.88	1.62	0.00	0.00	0.00	GREEN
9962	2.70	2.01	1.73	0.17	0.13	0.11	GREEN
9974	2.52	1.88	1.61	-0.01	0.00	-0.01	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK SC2: Combined SC uncertainty		
0536	PASS	Within-limits deviation from median for all results
2546	PASS	Within-limits deviation from median for all results
3652	PASS	Within-limits deviation from median for all results
3844	PASS	Within-limits deviation from median for all results
4394	PASS	Within-limits deviation from median for all results
4680	PASS	Within-limits deviation from median for all results
4709	PASS	Within-limits deviation from median for all results
5143	PASS	Within-limits deviation from median for all results
5481	PASS	Within-limits deviation from median for all results
5503	FAIL	Out-of-limit deviation from median for 3/3 results. Z-score > 3 for all the violated results.
6300	PASS	Within-limits deviation from median for all results
6857	PASS	Within-limits deviation from median for all results
6974	PASS	Within-limits deviation from median for all results
8418	PASS	Within-limits deviation from median for all results
8547	PASS	Within-limits deviation from median for all results
9254	PASS	Within-limits deviation from median for all results
9297	PASS	Within-limits deviation from median for all results
9398	PASS	Within-limits deviation from median for all results
9648	PASS	Within-limits deviation from median for all results
9962	PASS	Within-limits deviation from median for all results
9974	PASS	Within-limits deviation from median for all results

The table below provides the statistics for the 20 successful participants from Group A:

PARTICIPANTS TYPE A GROUP STATISTICS for Task SC2 - Combined SC uncertainty ONLY SUCCESSFUL PARTICIPANTS (20/21)				
Wind speed	Median [%]	Min [%]	Max [%]	Std Dev [%]
6 m/s	2.53	2.51	2.71	0.08
10 m/s	1.88	1.84	2.01	0.05
14 m/s	1.62	1.55	1.73	0.05

It is worth noting that two subgroups of successful participants have been identified:

- Fourteen (14) participants (0536, 2546, 3844, 4394, 4680, 4709, 5143, 6300, 6857, 6974, 9254, 9398, 9648 and 9974) have provided results equal or practically equal to the median value.
- Four (4) participants (3652, 5481, 8547 and 9962) have provided identical results.

The difference comes from the type B uncertainty components. Given the elementary calculation involved to combine the given type B uncertainty components, the Coordinator considers that there is an instruction-interpretation issue.

The following tables relate to participants type B.

	PARTICIPANTS TYPE B RESULTS for Task SC2 – Combined SC uncertainty						
	Combined SC uncertainty [%]			Deviation of participant from median value [%] Limit: 0.253, 0.188, 0.162			
	6 m/s	10 m/s	14 m/s	6 m/s	10 m/s	14 m/s	TASK RESULT
3542	2.69	2.00	1.73	0.16	0.12	0.11	GREEN
3755	2.52	1.88	1.61	0.01	0.00	0.01	GREEN
3856	2.71	2.01	1.73	0.18	0.13	0.11	GREEN
5417	2.60	1.92	1.64	0.07	0.04	0.02	GREEN
5492	2.53	1.88	1.61	0.00	0.00	0.01	GREEN
8069	2.68	2.02	1.73	0.15	0.14	0.11	GREEN
8376	7.83	6.00	5.07	5.30	4.12	3.45	RED: The z-score is also far too large
8610	Participant has chosen not to provide calculations						

PARTICIPANTS TYPE B, DECISION FOR TASK SC2: Combined SC uncertainty		
3542	PASS	Within-limits deviation from median for all results
3755	PASS	Within-limits deviation from median for all results
3856	PASS	Within-limits deviation from median for all results
5417	PASS	Within-limits deviation from median for all results
5492	PASS	Within-limits deviation from median for all results
8069	PASS	Within-limits deviation from median for all results
8376	FAIL	Out-of-limit deviation from median for 3/3 results. Z-score >> 3 for all the violated results. Non-plausible results provided, even if accounting for the evidently wrong units in which they submitted their results.
8610		Participant has chosen not to provide calculations

The table below provides the statistics for the 6 successful participants from Group B:

PARTICIPANTS TYPE B GROUP STATISTICS for Task SC2 - Combined SC uncertainty ONLY SUCCESSFUL PARTICIPANTS (6/8)				
Wind speed	Median [%]	Min [%]	Max [%]	Std Dev [%]
6 m/s	2.64	2.52	2.71	0.08
10 m/s	1.96	1.88	2.02	0.06
14 m/s	1.69	1.61	1.73	0.06

It is worth noting that two subgroups of successful participants have been identified, as it was the case for Group A:

- Two (2) participants (3755 and 5492) have provided results equal or practically equal to the median value.
- Three (3) participants (3542, 3856 and 8069) have provided close results.

As noted previously, the difference comes from the type B uncertainty components. Given the elementary calculation involved to combine the given type B uncertainty components, the Coordinator considers that there is an instruction-interpretation issue.

6.3. Power Curve – Task PC1

All the participants provided results for Task PC1. The assessed result is the bin-average power for each of the wind speed bins from 3 m/s to the last-completed bin of the power curve table, which was 20.5 m/s according to all type A participants.

The median value is based on the results of all type A participants. No outliers found.

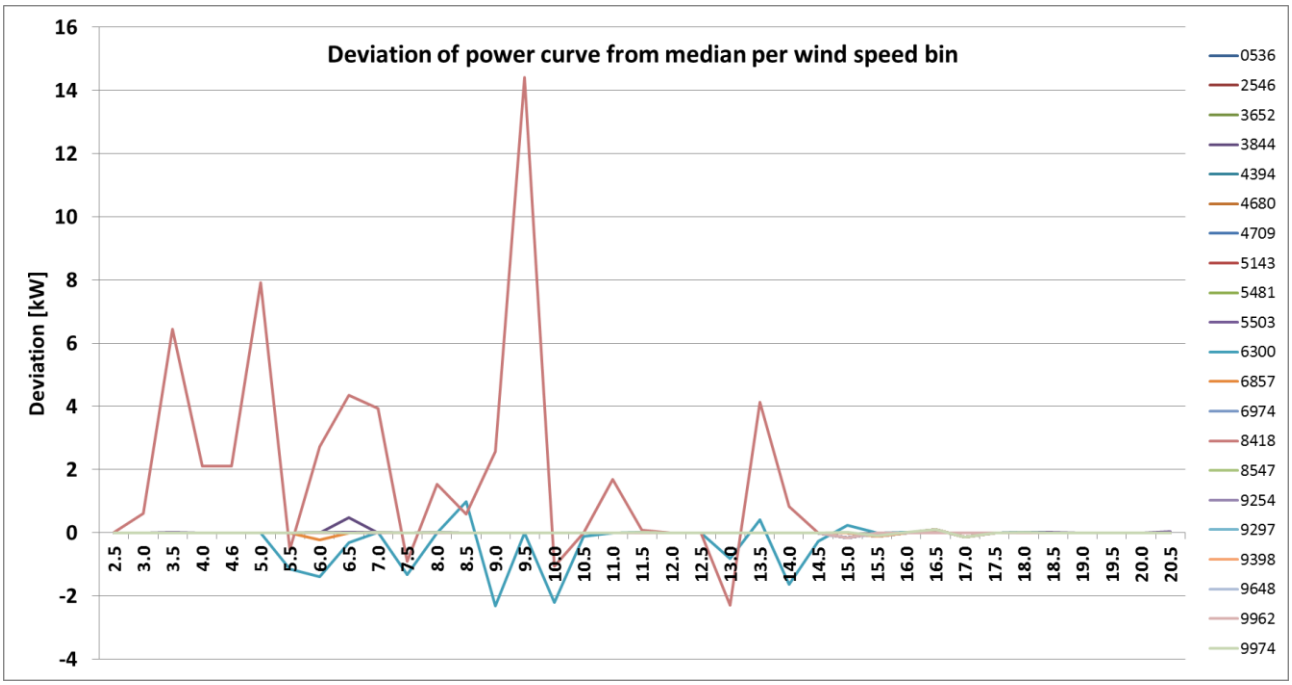
	PARTICIPANTS GROUP STATISTICS for Task PC1 – Calculation of binned power values in power curve table							
	TYPE A				TYPE B			
	Bin-average Power P_n				Bin-average Power P_n			
Bin	Median	Min	Max	Deviation threshold max{1 kW; 0.1% x Pn}	Median	Min	Max	Deviation of median from TYPE A
[-]	[kW]	[kW]	[kW]		[kW]	[kW]	[kW]	[kW]
5	-3.89	-3.89	-3.88	n.a.	-3.89	-3.89	-3.89	0.00
6	1.02	1.01	1.63	1.00	1.02	1.02	1.02	0.00
7	3.57	3.57	10.01	1.00	3.57	3.57	6.42	0.00
8	54.77	54.77	56.88	1.00	54.77	52.79	56.66	0.00
9	130.17	130.17	132.27	1.00	130.17	129.32	137.95	0.00
10	213.68	213.68	221.59	1.00	213.68	209.30	228.70	0.00
11	292.05	290.89	292.05	1.00	292.05	288.16	306.69	0.00
12	403.23	401.85	405.95	1.00	403.23	397.61	424.03	0.00
13	525.82	525.50	530.18	1.00	525.82	521.86	544.90	0.00
14	635.32	635.32	639.26	1.00	635.32	625.10	695.73	0.00
15	814.96	813.63	814.96	1.00	814.96	810.26	859.56	0.00
16	997.65	997.65	999.19	1.00	997.65	978.62	1027.05	0.00
17	1181.95	1181.95	1182.94	1.18	1181.95	1174.77	1236.95	0.00
18	1390.38	1388.05	1392.95	1.39	1390.38	1380.52	1462.73	0.00
19	1597.31	1597.31	1611.71	1.60	1597.31	1590.08	1686.87	0.00
20	1815.75	1813.54	1815.75	1.82	1815.75	1793.61	1891.30	0.00
21	2015.19	2015.08	2015.19	2.02	2015.19	2006.07	2092.28	0.00
22	2256.99	2256.99	2258.67	2.26	2256.99	2248.75	2352.78	0.00
23	2536.02	2536.02	2536.10	2.54	2536.02	2516.38	2604.22	0.00
24	2741.85	2741.85	2741.85	2.74	2741.85	2727.30	2823.85	0.00
25	2958.07	2958.07	2958.07	2.96	2958.07	2949.35	3004.02	0.00
26	3052.94	3050.64	3052.94	3.05	3052.94	3043.40	3134.33	0.00
27	3200.94	3200.94	3205.08	3.20	3200.94	3196.90	3209.56	0.00
28	3233.72	3232.08	3234.55	3.23	3233.72	3228.37	3257.27	0.00
29	3279.06	3278.79	3279.06	3.28	3279.06	3271.84	3290.15	0.00
30	3293.79	3293.62	3294.02	3.29	3293.79	3293.44	3296.88	0.00
31	3301.91	3301.80	3301.91	3.30	3301.80	3301.80	3302.49	-0.11
32	3306.42	3306.42	3306.42	3.31	3306.42	3306.42	3310.40	0.00
33	3310.60	3310.60	3310.70	3.31	3310.70	3310.03	3310.70	0.10
34	3308.91	3308.76	3308.91	3.31	3308.76	3308.76	3309.88	-0.15
35	3309.56	3309.56	3309.56	3.31	3309.56	3308.00	3309.56	0.00
36	3308.46	3308.46	3308.47	3.31	3308.46	3307.82	3308.46	0.00
37	3304.06	3304.06	3304.07	3.30	3304.06	3303.09	3305.98	0.00
38	3304.71	3304.70	3304.71	3.30	3304.71	3303.96	3304.89	0.00
39	3304.52	3304.52	3304.52	3.30	3304.52	3303.16	3304.80	0.00
40	3303.84	3303.84	3303.84	3.30	3303.84	3303.84	3304.82	0.00
41	3304.00	3304.00	3304.03	3.30	3304.00	3304.00	3304.00	0.00

The outcome of the task is based on an allowable deviation of 0.1% of the median binned-power value (or 1 kW; whichever is larger) for all the completed wind speed bins ≥ 3 m/s. The limit violation is indicated as orange-colored cells.

PARTICIPANTS TYPE A RESULTS for Task PC1 – Calculation of binned power curve table (continued next page)												
Bin	Deviation Limit	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
5	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
7	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
8	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.16
12	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	-1.38
13	1.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.00	0.00	0.01	-0.32
14	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
15	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.33
16	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
17	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99
18	1.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.33
19	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.21
21	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.11
22	2.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	2.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	3.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.83
27	3.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40
28	3.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-1.64
29	3.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.27
30	3.29	-0.17	-0.17	0.00	0.00	-0.17	-0.17	-0.17	-0.17	0.00	-0.17	0.23
31	3.30	0.00	0.00	-0.11	-0.11	0.00	0.00	0.00	0.00	-0.11	0.00	0.00
32	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	3.31	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00
34	3.31	0.00	0.00	-0.15	0.00	0.00	0.00	0.00	0.00	-0.15	0.00	-0.01
35	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
37	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
38	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
39	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED

PARTICIPANTS TYPE A RESULTS for Task PC1 – Calculation of binned power curve table (continued from previous page)											
Bin	Deviation Limit	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
5	n.a.	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.00	0.00	0.00	0.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	1.00	0.00	0.00	6.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.00	0.00	0.00	2.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	1.00	0.00	0.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	1.00	0.00	0.00	7.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	1.00	0.00	0.00	-0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	1.00	-0.23	0.00	2.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	1.00	0.00	0.00	4.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	1.00	0.00	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	1.00	0.00	0.00	-0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	1.00	0.00	0.00	1.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	1.18	0.00	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	1.39	0.00	0.00	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	1.60	0.00	0.00	14.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	1.82	0.00	0.00	-1.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	2.26	0.00	0.00	1.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	2.54	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	2.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	3.05	0.00	0.00	-2.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	3.20	0.00	0.00	4.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	3.23	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	3.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	3.29	0.00	-0.17	0.00	0.00	0.00	0.00	0.00	-0.17	-0.17	0.00
31	3.30	-0.11	0.00	-0.11	-0.11	-0.11	-0.11	-0.11	0.00	0.00	-0.11
32	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	3.31	0.10	0.00	0.10	0.10	0.10	0.10	0.10	0.00	0.00	0.10
34	3.31	-0.15	0.00	-0.15	-0.15	-0.15	-0.15	-0.15	0.00	0.00	-0.15
35	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
37	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
39	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TASK RESULT		GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK PC1: Calculation of binned power curve table		
0536	PASS	Within-limits deviation from median for all wind speed bins
2546	PASS	Within-limits deviation from median for all wind speed bins
3652	PASS	Within-limits deviation from median for all wind speed bins
3844	PASS	Within-limits deviation from median for all wind speed bins
4394	PASS	Within-limits deviation from median for all wind speed bins
4680	PASS	Within-limits deviation from median for all wind speed bins
4709	PASS	Within-limits deviation from median for all wind speed bins
5143	PASS	Within-limits deviation from median for all wind speed bins
5481	PASS	Within-limits deviation from median for all wind speed bins
5503	PASS	Within-limits deviation from median for all wind speed bins
6300	FAIL	Out-of-limits deviation from median for 5 wind speed bins
6857	PASS	Within-limits deviation from median for all wind speed bins
6974	PASS	Within-limits deviation from median for all wind speed bins
8418	FAIL	Out-of-limits deviation from median for 11 wind speed bins
8547	PASS	Within-limits deviation from median for all wind speed bins
9254	PASS	Within-limits deviation from median for all wind speed bins
9297	PASS	Within-limits deviation from median for all wind speed bins
9398	PASS	Within-limits deviation from median for all wind speed bins
9648	PASS	Within-limits deviation from median for all wind speed bins
9962	PASS	Within-limits deviation from median for all wind speed bins
9974	PASS	Within-limits deviation from median for all wind speed bins



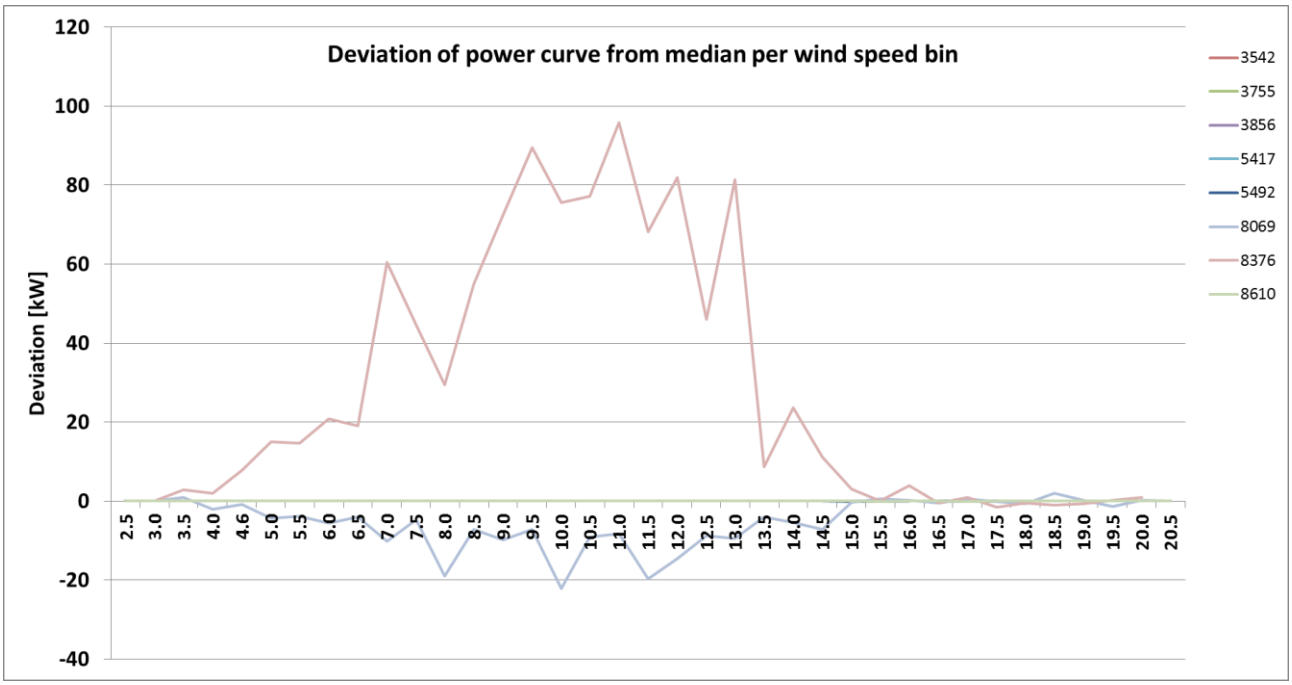
The table below provides the statistics for the 19 successful participants from Group A:

	PARTICIPANTS GROUP A STATISTICS for Task PC1 – Calculation of binned power values in power curve table ONLY SUCCESSFUL PARTICIPANTS (19/21)			
Bin	Median	Min	Max	Standard Deviation
[-]	[kW]	[kW]	[kW]	[kW]
5	-3.89	-3.89	-3.89	0.00
6	1.02	1.01	1.02	0.00
7	3.57	3.57	3.58	0.00
8	54.77	54.77	54.77	0.00
9	130.17	130.17	130.17	0.00
10	213.68	213.68	213.68	0.00
11	292.05	292.05	292.05	0.00
12	403.23	403.00	403.24	0.05
13	525.82	525.82	526.29	0.10
14	635.32	635.32	635.33	0.00
15	814.96	814.96	814.96	0.00
16	997.65	997.65	997.66	0.00
17	1181.95	1181.95	1181.95	0.00
18	1390.38	1390.38	1390.38	0.00
19	1597.31	1597.31	1597.31	0.00
20	1815.75	1815.75	1815.75	0.00
21	2015.19	2015.19	2015.19	0.00
22	2256.99	2256.99	2256.99	0.00
23	2536.02	2536.02	2536.02	0.00
24	2741.85	2741.85	2741.85	0.00
25	2958.07	2958.07	2958.07	0.00
26	3052.94	3052.94	3052.94	0.00
27	3200.94	3200.94	3200.94	0.00
28	3233.72	3233.72	3233.72	0.00
29	3279.06	3279.06	3279.06	0.00
30	3293.62	3293.62	3293.79	0.09
31	3301.91	3301.80	3301.91	0.05
32	3306.42	3306.42	3306.42	0.00
33	3310.60	3310.60	3310.70	0.05
34	3308.91	3308.76	3308.91	0.07
35	3309.56	3309.56	3309.56	0.00
36	3308.46	3308.46	3308.47	0.00
37	3304.06	3304.06	3304.07	0.00
38	3304.71	3304.70	3304.71	0.00
39	3304.52	3304.52	3304.52	0.00
40	3303.84	3303.84	3303.84	0.00
41	3304.00	3304.00	3304.03	0.01

The following tables relate to type B participants. The limit violation is indicated as orange-colored cells.

PARTICIPANTS TYPE B RESULTS for Task PC1 – Calculation of binned power curve table									
Bin	Deviation Limit	3542	3755	3856	5417	5492	8069	8376	8610
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
5	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	1.00	0.00	0.00	0.00	0.00	0.00	0.94	2.85	0.00
8	1.00	0.00	0.00	0.00	0.00	0.00	-1.99	1.89	0.00
9	1.00	0.00	0.00	0.00	0.00	0.00	-0.85	7.78	0.00
10	1.00	0.00	0.00	0.00	0.00	0.00	-4.38	15.02	0.00
11	1.00	0.00	0.00	0.00	0.00	0.00	-3.89	14.64	0.00
12	1.00	0.00	0.00	0.00	0.00	0.00	-5.62	20.80	0.00
13	1.00	0.00	0.00	0.00	0.00	0.00	-3.96	19.08	0.00
14	1.00	0.00	0.00	0.00	0.00	0.00	-10.22	60.41	0.00
15	1.00	0.00	0.00	0.00	0.00	0.00	-4.70	44.60	0.00
16	1.00	0.00	0.00	0.00	0.00	0.00	-19.03	29.40	0.00
17	1.18	0.00	0.00	0.00	0.00	0.00	-7.18	55.00	0.00
18	1.39	0.00	0.00	0.00	0.00	0.00	-9.86	72.35	0.00
19	1.60	0.00	0.00	0.00	0.00	0.00	-7.23	89.56	0.00
20	1.82	0.00	0.00	0.00	0.00	0.00	-22.14	75.55	0.00
21	2.02	0.00	0.00	0.00	0.00	0.00	-9.12	77.09	0.00
22	2.26	0.00	0.00	0.00	0.00	0.00	-8.24	95.79	0.00
23	2.54	0.00	0.00	0.00	0.00	0.00	-19.64	68.20	0.00
24	2.74	0.00	0.00	0.00	0.00	0.00	-14.55	82.00	0.00
25	2.96	0.00	0.00	0.00	0.00	0.00	-8.72	45.95	0.00
26	3.05	0.00	0.00	0.00	0.00	0.00	-9.54	81.39	0.00
27	3.20	0.00	0.00	0.00	0.00	0.00	-4.04	8.62	0.00
28	3.23	0.00	0.00	0.00	0.00	0.00	-5.35	23.55	0.00
29	3.28	0.00	0.00	0.00	0.00	0.00	-7.22	11.09	0.00
30	3.29	0.00	0.00	0.00	0.00	-0.17	-0.35	3.09	0.00
31	3.30	-0.11	-0.11	-0.11	-0.11	0.00	0.58	-0.01	-0.11
32	3.31	0.00	0.00	0.00	0.00	0.00	0.17	3.98	0.00
33	3.31	0.10	0.10	0.10	0.10	0.00	-0.46	-0.57	0.10
34	3.31	-0.15	-0.15	-0.15	-0.15	0.00	0.64	0.97	-0.15
35	3.31	0.00	0.00	0.00	0.00	0.00	-0.18	-1.56	0.00
36	3.31	0.00	0.00	0.00	0.00	0.00	-0.64	-0.43	0.00
37	3.30	0.00	0.00	0.00	0.00	0.00	1.92	-0.97	0.00
38	3.30	0.00	0.00	0.00	0.00	0.00	0.18	-0.75	0.00
39	3.30	0.00	0.00	0.00	0.00	0.00	-1.36	0.28	0.00
40	3.30	0.00	0.00	0.00	0.00	0.00	0.26	0.98	0.00
41	3.30	0.00	0.00	0.00	0.00	0.00	0.00	Value not reported	0.00
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	RED	RED	GREEN

PARTICIPANTS TYPE B, DECISION FOR TASK PC1: Calculation of binned power curve table		
3542	PASS	Within-limits deviation from median for all wind speed bins
3755	PASS	Within-limits deviation from median for all wind speed bins
3856	PASS	Within-limits deviation from median for all wind speed bins
5417	PASS	Within-limits deviation from median for all wind speed bins
5492	PASS	Within-limits deviation from median for all wind speed bins
8069	FAIL	Out-of-limits deviation from median for 21 wind speed bins
8376	FAIL	Out-of-limits deviation from median for 23 wind speed bins, plus one missing value
8610	PASS	Within-limits deviation from median for all wind speed bins



The table below provides the statistics for the 6 successful participants from Group B:

	PARTICIPANTS GROUP B STATISTICS for Task PC1 – Calculation of binned power values in power curve table ONLY SUCCESSFUL PARTICIPANTS (6/8)			
Bin	Median	Min	Max	Standard Deviation
[-]	[kW]	[kW]	[kW]	[kW]
5	-3.89	-3.89	-3.89	0.00
6	1.02	1.02	1.02	0.00
7	3.57	3.57	3.57	0.00
8	54.77	54.77	54.77	0.00
9	130.17	130.17	130.17	0.00
10	213.68	213.68	213.68	0.00
11	292.05	292.05	292.05	0.00
12	403.23	403.23	403.23	0.00
13	525.82	525.82	525.82	0.00
14	635.32	635.32	635.32	0.00
15	814.96	814.96	814.96	0.00
16	997.65	997.65	997.65	0.00
17	1181.95	1181.95	1181.95	0.00
18	1390.38	1390.38	1390.38	0.00
19	1597.31	1597.31	1597.31	0.00
20	1815.75	1815.75	1815.75	0.00
21	2015.19	2015.19	2015.19	0.00
22	2256.99	2256.99	2256.99	0.00
23	2536.02	2536.02	2536.02	0.00
24	2741.85	2741.85	2741.85	0.00
25	2958.07	2958.07	2958.07	0.00
26	3052.94	3052.94	3052.94	0.00
27	3200.94	3200.94	3200.94	0.00
28	3233.72	3233.72	3233.72	0.00
29	3279.06	3279.06	3279.06	0.00
30	3293.79	3293.62	3293.79	0.06
31	3301.80	3301.80	3301.91	0.04
32	3306.42	3306.42	3306.42	0.00
33	3310.70	3310.60	3310.70	0.04
34	3308.76	3308.76	3308.91	0.06
35	3309.56	3309.56	3309.56	0.00
36	3308.46	3308.46	3308.46	0.00
37	3304.06	3304.06	3304.06	0.00
38	3304.71	3304.71	3304.71	0.00
39	3304.52	3304.52	3304.52	0.00
40	3303.84	3303.84	3303.84	0.00
41	3304.00	3304.00	3304.00	0.00

6.4. Power Curve – Task PC2

All the participants provided results for task PC2. The assessed result is the bin-average power uncertainty for each of the wind speed bins from 3 m/s to the last-completed bin of the power curve table, which was 20.5 m/s according to all type A participants.

The median value is based on the results of all type A participants. No outliers found.

PARTICIPANTS GROUP STATISTICS for Task PC2 – Calculation of combined power uncertainty in power curve table										
TYPE A						TYPE B				
Bin	Median	Min	Max	StdDev	Deviation threshold 10% x median	Median	Min	Max	Std. Dev	Deviation of median from TYPE A
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
5	7.0	6.9	8.8	0.4	n.a.	6.97	6.93	7.21	0.11	-0.05
6	7.5	7.5	9.2	0.4	0.8	7.5	7.4	8.2	0.2	0.0
7	14.6	14.2	20.5	1.3	1.5	14.7	10.3	28.8	5.1	0.1
8	27.6	26.5	32.9	1.3	2.8	27.9	15.5	60.7	12.1	0.3
9	40.5	38.6	58.7	4	4.1	41.1	22.9	87.7	17.4	0.6
10	44.8	42.9	50.6	1.8	4.5	45.7	25.6	97.2	19.2	0.9
11	52.0	49.9	56.5	1.9	5.2	53.3	31.2	111.9	21.8	1.3
12	66.6	64.1	73.0	2.7	6.7	68.5	41.1	141.9	27.3	2.0
13	69.0	66.6	75.4	2.7	6.9	71.1	43.4	145.6	28.2	2.1
14	90.9	88.0	97.2	3.4	9.1	93.9	59.0	190.7	36.5	3.0
15	112.9	109.4	121.6	4.5	11.3	117.0	73.7	234.5	44.0	4.1
16	118.8	115.5	129.7	5.2	11.9	123.5	81.1	244.1	45.3	4.6
17	138.6	134.9	150.1	5.9	13.9	143.9	96.3	282.8	52.5	5.3
18	159.3	155.3	173.6	7.4	15.9	166.1	110.1	322.6	59.6	6.8
19	161.2	157.3	175.1	6.8	16.1	167.8	113.0	323.6	59.6	6.6
20	159.5	156.0	173.0	6.5	16.0	165.9	116.9	317.5	57.4	6.4
21	178.5	174.6	194.7	7.9	17.9	186.2	134.4	352.6	63.5	7.8
22	211.6	207.3	230.8	9.2	21.2	220.8	152.6	415.7	75.7	9.3
23	207.6	203.6	226.9	9.1	20.8	216.8	155.1	404.5	71.8	9.2
24	188.5	185.0	205.8	8.2	18.9	196.8	147.1	364.6	62.9	8.4
25	142.5	140.0	155.1	5.9	14.3	148.5	109.9	272.8	47.9	6.1
26	115.8	113.9	127.0	5.3	11.6	121.2	91.9	219.2	36.9	5.4
27	88.8	87.3	96.8	3.8	8.9	89.4	71.6	166.4	28.2	0.7
28	42.5	41.7	46.0	1.6	4.3	44.3	34.0	74.9	12.5	1.8
29	35.1	34.1	37.0	1.1	3.5	34.5	31.0	59.1	8.9	-0.6
30	20.5	20.4	21.5	0.4	2.1	20.7	18.8	27.9	2.7	0.2
31	17.6	17.4	18.6	0.2	1.8	17.8	17.1	20.7	1.2	0.1
32	16.8	16.7	17.6	0.2	1.7	16.9	16.5	18.5	0.6	0.1
33	16.0	15.9	16.8	0.2	1.6	16.0	15.9	16.1	0.1	0.0
34	16.0	15.9	16.8	0.2	1.6	16.0	15.9	16.0	0.0	0.0
35	16.0	15.9	16.8	0.2	1.6	16.0	15.9	16.0	0.0	0.0
36	16.3	16.0	17.2	0.2	1.6	16.4	16.0	17.2	0.3	0.1
37	16.2	16.1	17.0	0.2	1.6	16.2	16.0	16.7	0.2	0.0
38	16.0	15.9	16.8	0.2	1.6	16.0	15.9	16.1	0.1	0.0
39	16.0	15.9	16.8	0.2	1.6	16.0	15.9	16.1	0.0	0.0

PARTICIPANTS GROUP STATISTICS for Task PC2 – Calculation of combined power uncertainty in power curve table										
TYPE A						TYPE B				
Bin	Median	Min	Max	StdDev	Deviation threshold 10% x median	Median	Min	Max	Std. Dev	Deviation of median from TYPE A
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
40	16.1	16.0	19.8	0.8	1.6	16.1	16.0	16.4	0.1	0.0
41	16.0	15.9	19.7	0.8	1.6	16.0	15.9	16.0	0.0	0.0

The outcome of the task is based on the combination of two criteria. The primary criterion is based on a maximum allowed deviation of 10% from the median value of the combined uncertainty at each wind speed bin ≥ 3 m/s. If the primary criterion is violated in one or more wind speed bins, then the participant is evaluated with the secondary criterion for the violated bins (indicated in orange). The secondary criterion is based on the z-score, i.e. it considers the deviation from the median based on the dispersion (standard deviation) of the participants' results.

PARTICIPANTS TYPE A RESULTS for Task PC2 – Calculation of combined power uncertainty in power curve table (continued next page)												
		Deviation from median value of power uncertainty										
Bin	Deviation Limit	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
5	n.a.	0.0	0.0	0.2	-7.0	0.2	-0.1	-0.1	0.0	0.2	1.8	-0.1
6	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.7	0.0
7	1.5	0.3	-0.1	0.3	0.0	0.0	0.0	0.3	0.3	0.3	5.9	-0.1
8	2.8	0.7	-0.3	0.9	0.0	-0.2	-0.2	0.7	0.7	0.9	5.3	-0.4
9	4.1	1.1	-1.0	1.4	0.2	-0.8	-0.8	1.2	1.1	1.4	18.3	-1.1
10	4.5	1.5	-1.0	2.0	0.5	-0.8	-0.8	1.6	1.5	2.0	5.8	-1.3
11	5.2	2.2	-1.1	2.7	1.1	-0.9	-0.9	2.3	2.2	2.7	4.5	-1.3
12	6.7	3.4	-1.3	4.1	2.2	-1.1	-1.1	3.5	3.4	4.1	6.4	-1.5
13	6.9	3.6	-1.3	4.4	2.4	-1.0	-1.0	3.8	3.7	4.4	6.4	-1.7
14	9.1	5.2	-1.5	6.3	3.5	-1.2	-1.2	5.3	5.2	6.3	2.9	-2.4
15	11.3	7.2	-1.9	8.7	5.3	-1.4	-1.4	7.4	7.2	8.7	4.2	-2.4
16	11.9	8.1	-1.8	9.7	6.2	-1.3	-1.3	8.2	8.1	9.7	10.9	-1.9
17	13.9	9.2	-2.0	11.1	7.3	-1.5	-1.5	9.4	9.3	11.1	11.5	-3.6
18	15.9	11.9	-2.2	14.2	9.6	-1.6	-1.6	12.1	12.0	14.2	11.9	-3.9
19	16.1	11.3	-2.2	13.9	9.2	-1.5	-1.5	11.6	11.4	13.9	6.1	-2.9
20	16.0	11.1	-2.0	13.4	9.2	-1.3	-1.3	11.4	11.2	13.4	7.6	-2.4
21	17.9	13.4	-2.1	16.3	11.4	-1.4	-1.4	13.6	13.5	16.2	11.7	-2.8
22	21.2	16.1	-2.3	19.2	13.9	-1.6	-1.6	16.3	16.2	19.2	9.2	-3.9
23	20.8	16.0	-2.3	19.3	13.9	-1.4	-1.4	16.1	16.1	19.3	11.2	-3.2
24	18.9	14.5	-1.8	17.3	12.7	-1.2	-1.2	14.6	14.6	17.3	9.9	-2.8
25	14.3	10.5	-1.3	12.6	9.3	-0.8	-0.8	10.6	10.6	12.6	6.8	-2.2
26	11.6	9.3	-1.2	11.2	8.2	-0.6	-0.6	9.4	9.3	11.2	7.1	-1.2
27	8.9	6.7	-0.8	8.1	5.9	-0.5	-0.5	6.7	6.7	8.0	2.6	-1.4
28	4.3	3.0	-0.4	3.5	2.6	-0.2	-0.2	3.0	3.0	3.5	1.8	-0.7
29	3.5	1.5	-0.9	2.0	1.3	-0.7	-0.7	1.5	1.5	2.0	0.7	0.0
30	2.1	0.6	-0.1	0.6	0.4	-0.1	-0.1	0.6	0.6	0.6	1.0	-0.2

PARTICIPANTS TYPE A RESULTS for Task PC2 – Calculation of combined power uncertainty in power curve table (continued next page)												
		Deviation from median value of power uncertainty										
Bin	Deviation Limit	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
31	1.8	0.3	-0.1	0.3	0.2	0.0	0.0	0.3	0.3	0.3	1.0	-0.2
32	1.7	0.1	-0.1	0.2	0.1	0.0	0.0	0.1	0.1	0.2	0.8	-0.1
33	1.6	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	-0.1
34	1.6	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	-0.1
35	1.6	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	-0.1
36	1.6	0.1	-0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.8	-0.1
37	1.6	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	-0.1
38	1.6	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	-0.1
39	1.6	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	-0.1
40	1.6	0.0	-0.1	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0.8	-0.1
41	1.6	0.0	-0.1	0.0	3.7	0.0	0.0	0.0	0.5	0.0	0.8	-0.1
TASK RESULT		GREEN	GREEN	GREEN	*	GREEN	GREEN	GREEN	GREEN	GREEN	*	GREEN

(*) Decision to be based on the z-score for each of the orange cells.

PARTICIPANTS TYPE A RESULTS for Task PC2 – Calculation of combined power uncertainty in power curve table (continued from above)											
		Deviation from median value of power uncertainty									
Bin	Deviation Limit	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
5	n.a.	0.0	-0.1	0.0	0.2	0.2	-0.1	0.1	0.0	0.2	-0.1
6	0.8	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	1.5	-0.1	-0.4	2.1	0.3	-0.1	0.3	-0.1	0.2	0.0	0.0
8	2.8	-0.3	-1.1	1.9	0.9	-0.3	0.7	-0.3	0.4	-0.3	-0.2
9	4.1	-1.0	-1.9	2.4	1.4	-0.9	1.1	-1.0	0.0	-0.8	-0.8
10	4.5	-1.0	-2.0	1.2	2.0	-0.9	1.5	-1.0	0.0	-0.8	-0.8
11	5.2	-1.3	-2.1	1.6	2.7	-1.0	2.2	-1.1	0.0	-0.8	-0.9
12	6.7	-1.3	-2.5	4.6	4.1	-1.1	3.4	-1.3	0.0	-0.9	-1.0
13	6.9	-1.1	-2.4	4.0	4.4	-1.1	3.6	-1.3	0.0	-0.9	-1.0
14	9.1	-1.5	-3.0	4.3	6.3	-1.4	5.2	-1.5	0.0	-1.0	-1.2
15	11.3	-1.9	-3.4	6.4	8.7	-1.6	7.2	-1.9	0.0	-1.1	-1.4
16	11.9	-1.9	-3.4	7.1	9.7	-1.5	8.1	-1.8	0.0	-1.0	-1.3
17	13.9	-2.1	-3.7	7.0	11.1	-1.7	9.3	-2.0	0.0	-1.0	-1.4
18	15.9	-2.3	-4.0	13.7	14.2	-1.8	12.0	-2.2	0.0	-1.0	-1.5
19	16.1	-2.1	-3.8	10.1	13.9	-1.8	11.4	-2.2	0.0	-0.9	-1.4
20	16.0	-2.0	-3.5	5.8	13.4	-1.7	11.2	-2.0	0.0	-0.7	-1.3
21	17.9	-2.1	-3.8	11.9	16.3	-1.7	13.5	-2.1	0.0	-0.6	-1.3
22	21.2	-2.2	-4.3	12.4	19.2	-2.0	16.2	-2.3	0.0	-0.4	-1.4
23	20.8	-2.3	-4.0	11.9	19.3	-1.8	16.1	-2.3	0.0	-0.4	-1.3
24	18.9	-1.8	-3.4	11.3	17.3	-1.6	14.6	-1.8	0.0	-0.1	-1.1
25	14.3	-1.3	-2.5	7.0	12.6	-1.1	10.6	-1.3	0.0	0.0	-0.8
26	11.6	-1.1	-1.9	8.4	11.2	-0.9	9.3	-1.2	0.0	-0.1	-0.6
27	8.9	-0.8	-1.4	6.2	8.1	-0.7	6.7	-0.8	0.0	0.0	-0.4
28	4.3	-0.3	-0.6	0.3	3.5	-0.3	3.0	-0.3	0.0	0.0	-0.2

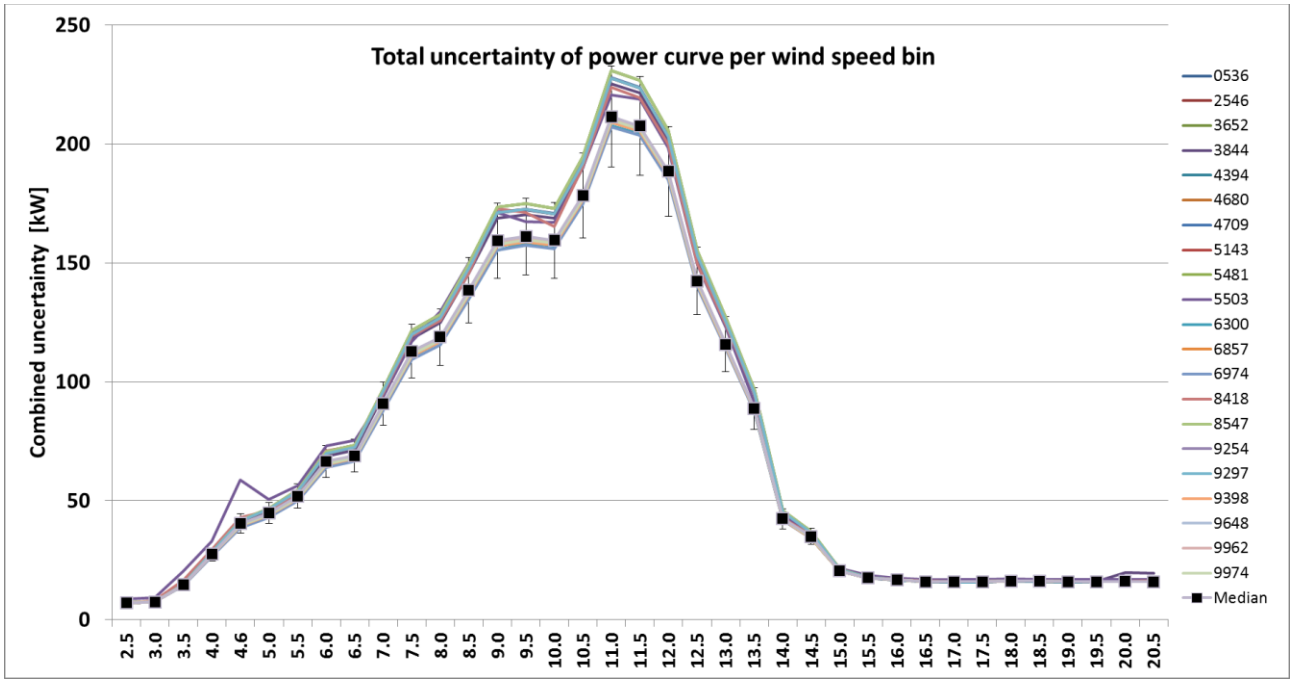
PARTICIPANTS TYPE A RESULTS for Task PC2 – Calculation of combined power uncertainty in power curve table (continued from above)											
		Deviation from median value of power uncertainty									
Bin	Deviation Limit	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
29	3.5	-0.8	-1.0	0.6	2.0	-0.8	1.6	-0.8	-0.6	-0.6	-0.7
30	2.1	-0.2	-0.1	0.3	0.6	-0.1	0.5	-0.1	0.0	0.0	-0.1
31	1.8	-0.1	0.0	0.1	0.3	-0.1	0.2	-0.1	0.0	0.0	0.0
32	1.7	0.0	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.0
33	1.6	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3	0.0	0.0
34	1.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
35	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
36	1.6	0.0	0.0	0.1	0.1	0.0	0.1	0.0	-0.3	0.0	0.0
37	1.6	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
38	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
39	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
40	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
41	1.6	0.4	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TASK RESULT		GREEN	GREEN	*	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

(*) Decision to be based on the z-score for each of the orange cells.

Participants 3844, 5503 and 8418 violated the absolute deviation threshold of 10% from median and have been re-evaluated using the Z-criterion for the violated bins only (see below).

PARTICIPANTS TYPE A RESULTS for Task PC2 – Calculation of combined power uncertainty in power curve table z-score results for 3844, 5503 and 8418 to decide PASS/FAIL according to the secondary criterion			
Bin	3844	5503	8418
[-]	Z-value	Z-value	Z-value
6		**4.54**	
7		**4.53**	**1.58**
8		**4.18**	
9		**4.52**	
10		**3.30**	
40	**4.62**		
41	**4.63**		
Bins to be evaluated with z-criterion	40 , 41	6 to 10	7
TASK RESULT	RED	RED	YELLOW

PARTICIPANTS TYPE A, DECISION FOR TASK PC2: Calculation of combined power uncertainty in power curve table		
0536	PASS	Within-limits deviation from median for all results
2546	PASS	Within-limits deviation from median for all results
3652	PASS	Within-limits deviation from median for all results
3844	FAIL	Out of limits deviation for 2 wind speed bins. Z-score > 3 for all the violated bins.
4394	PASS	Within-limits deviation from median for all results
4680	PASS	Within-limits deviation from median for all results
4709	PASS	Within-limits deviation from median for all results
5143	PASS	Within-limits deviation from median for all results
5481	PASS	Within-limits deviation from median for all results
5503	PASS	Zero deviation from median for all results
6300	PASS	Within-limits deviation from median for all results
6857	FAIL	Out of limits deviation for 5 wind speed bins. Z-score > 3 for all the violated bins.
6974	PASS	Within-limits deviation from median for all results
8418	FAIL	Out of limits deviation for 1 wind speed bin. Z-score within range (1,3] for the violated bin.
8547	PASS	Within-limits deviation from median for all results
9254	PASS	Within-limits deviation from median for all results
9297	PASS	Within-limits deviation from median for all results
9398	PASS	Within-limits deviation from median for all results
9648	PASS	Within-limits deviation from median for all results
9962	PASS	Within-limits deviation from median for all results
9974	PASS	Within-limits deviation from median for all results



Results for participants A. The error bar is ±10% of the median value (the acceptance range).

The table below provides the statistics for the 18 successful participants from Group A:

PARTICIPANTS TYPE A GROUP STATISTICS for Task PC2 – Calculation of combined power uncertainty in power curve table ONLY SUCCESSFUL PARTICIPANTS (18/21)				
Bin	Median	Min	Max	Standard deviation
[-]	[kW]	[kW]	[kW]	[kW]
5	7.0	6.9	8.8	0.4
6	7.5	7.5	9.2	0.4
7	14.7	14.2	20.5	1.4
8	27.6	26.5	32.9	1.3
9	40.1	38.6	58.7	4.3
10	44.4	42.9	50.6	1.9
11	51.6	49.9	56.5	1.9
12	66.1	64.1	73.0	2.7
13	68.6	66.6	75.4	2.8
14	90.5	88.0	97.2	3.5
15	112.3	109.4	121.6	4.6
16	118.4	115.5	129.7	5.3
17	138.1	134.9	150.1	6.1
18	158.9	155.3	173.6	7.4
19	160.7	157.3	175.1	6.9
20	159.2	156.0	173.0	6.7
21	178.2	174.6	194.7	8.1
22	211.4	207.3	230.8	9.4
23	207.4	203.6	226.9	9.4
24	188.4	185.0	205.8	8.4
25	142.5	140.0	155.1	6.1
26	115.7	113.9	127.0	5.4
27	88.8	87.3	96.8	3.8
28	42.4	41.7	46.0	1.7
29	34.8	34.1	37.0	1.2
30	20.5	20.4	21.5	0.4
31	17.6	17.4	18.6	0.3
32	16.8	16.7	17.6	0.2
33	16.0	15.9	16.8	0.2
34	16.0	15.9	16.8	0.2
35	16.0	15.9	16.8	0.2
36	16.3	16.0	17.2	0.2
37	16.2	16.1	17.0	0.2
38	16.0	15.9	16.8	0.2
39	16.0	15.9	16.8	0.2
40	16.1	16.0	16.9	0.2
41	16.0	15.9	16.8	0.2

The following tables relate to type B participants. The bins where the deviation limit was exceeded are indicated in orange.

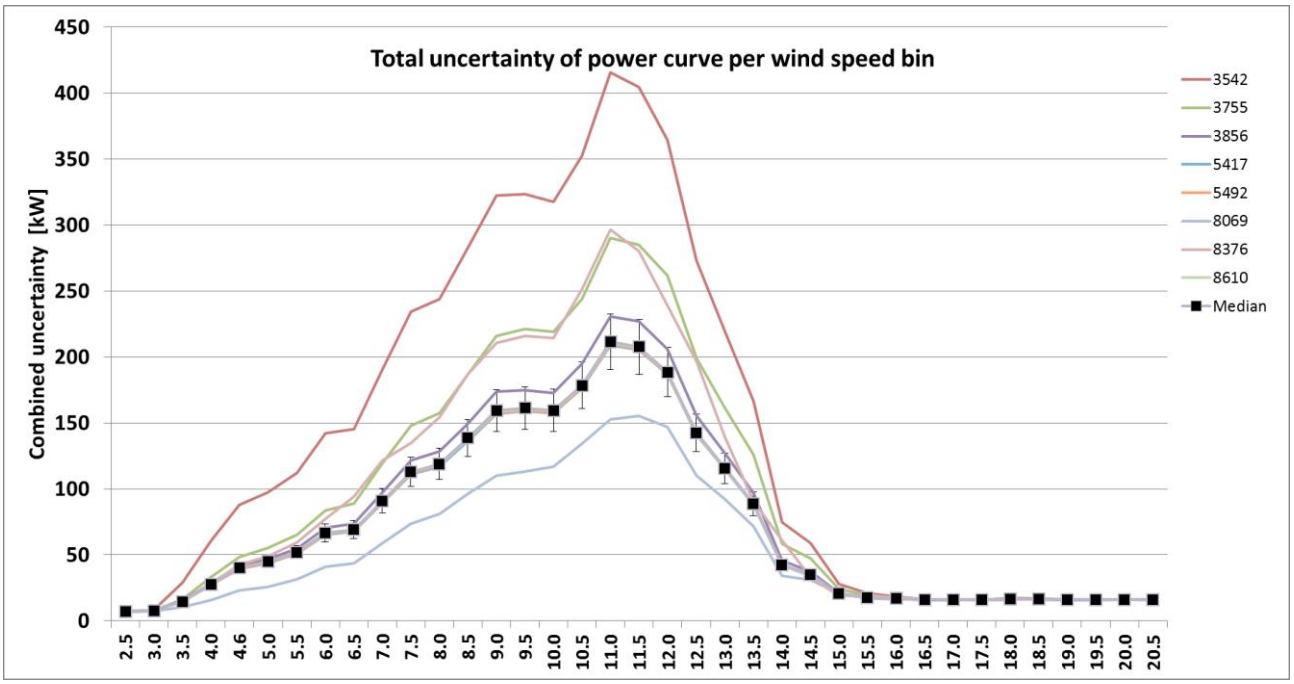
PARTICIPANTS TYPE B RESULTS for Task PC2 – Calculation of combined power uncertainty in power curve table									
Bin	Deviation Limit	Deviation from median value of power uncertainty							
		3542	3755	3856	5417	5492	8069	8376	8610
[-]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]	[kW]
5	n.a.	-0.1	-0.1	0.2	0.0	-0.1	0.0	-0.1	0.2
6	0.8	0.7	0.1	0.0	0.0	0.0	-0.1	0.1	0.0
7	1.5	14.3	1.7	0.3	-0.1	0.0	-4.3	-0.1	0.2
8	2.8	33.1	5.5	0.9	-0.3	-0.2	-12.1	0.3	0.3
9	4.1	47.3	7.7	1.4	-1.0	-0.8	-17.6	2.1	-0.2
10	4.5	52.4	10.4	2.0	-1.0	-0.8	-19.2	3.8	-0.1
11	5.2	59.9	13.1	2.7	-1.1	-0.8	-20.8	7.6	-0.2
12	6.7	75.3	17.2	4.1	-1.3	-0.9	-25.5	10.6	-0.2
13	6.9	76.6	19.9	4.4	-1.3	-0.8	-25.6	25.1	-0.3
14	9.1	99.7	28.8	6.3	-1.5	-0.9	-32.0	30.5	-0.3
15	11.3	121.7	35.2	8.7	-1.9	-1.1	-39.2	21.9	-0.5
16	11.9	125.3	38.4	9.7	-1.8	-0.8	-37.8	35.6	-0.5
17	13.9	144.2	48.2	11.1	-2.0	-0.7	-42.3	48.4	-0.6
18	15.9	163.3	56.8	14.2	-2.2	-2.1	-49.2	51.3	-0.7
19	16.1	162.5	60.2	13.9	-2.2	-1.9	-48.1	54.9	-0.7
20	16.0	157.9	59.3	13.4	-2.0	-1.5	-42.7	55.0	-0.6
21	17.9	174.1	65.4	16.3	-2.1	-1.7	-44.1	72.7	-0.7
22	21.2	204.1	78.6	19.2	-2.3	-1.6	-59.0	84.8	-0.7
23	20.8	196.9	77.2	19.3	-2.3	-1.4	-52.5	72.4	-0.8
24	18.9	176.1	73.4	17.3	-1.8	-1.1	-41.4	50.7	-0.6
25	14.3	130.3	56.4	12.6	-1.3	-0.7	-32.5	53.8	-0.5
26	11.6	103.5	45.4	11.2	-1.2	-0.8	-23.9	23.0	-0.5
27	8.9	77.6	37.0	8.1	-0.8	-0.5	-17.2	1.7	-0.4
28	4.3	32.5	16.0	3.5	-0.4	0.1	-8.4	18.4	-0.2
29	3.5	24.1	12.1	2.0	-0.8	-0.5	-4.1	-2.1	-0.7
30	2.1	7.4	3.5	0.6	-0.2	0.0	0.3	-1.7	-0.1
31	1.8	3.1	1.5	0.3	-0.1	0.0	-0.5	1.8	0.0
32	1.7	1.7	0.8	0.2	-0.1	0.0	-0.3	0.5	0.0
33	1.6	0.1	0.1	0.0	-0.1	0.0	0.0	-0.1	0.0
34	1.6	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.0
35	1.6	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.0
36	1.6	0.9	0.5	0.1	-0.1	0.0	-0.3	0.2	0.0
37	1.6	0.4	0.2	0.0	-0.1	0.0	-0.2	0.2	0.0
38	1.6	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	0.0
39	1.6	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
40	1.6	0.0	0.0	0.0	-0.1	0.0	-0.1	0.3	0.0
41	1.6	0.0	0.0	0.0	-0.1	0.0	0.0	-16.0	0.0
TASK RESULT		*	*	GREEN	GREEN	GREEN	*	*	GREEN

(*) Decision to be based on the z-score for each of the orange cells.

Participants 3542, 3755, 8069 and 8376 violated the absolute deviation threshold of 10% from median and are re-evaluated using the Z-criterion for the violated bins only (see below).

PARTICIPANTS TYPE B RESULTS for Task PC2 – Calculation of combined power uncertainty in power curve table z-score results for 3542, 3755, 8069 and 8376 to decide PASS/FAIL according to the secondary criterion				
Bin	3542	3755	8069	8376
[-]	Z-value	Z-value	Z-value	Z-value
7	10.89	1.29	3.29	
8	26.00	4.31	9.45	
9	11.68	1.90	4.34	
10	29.86	5.90	10.97	
11	32.27	7.03	11.18	4.09
12	28.16	6.44	9.54	3.97
13	28.05	7.31	9.39	9.21
14	29.67	8.57	9.52	9.06
15	26.88	7.78	8.66	4.85
16	24.20	7.42	7.30	6.87
17	24.52	8.19	7.19	8.23
18	22.09	7.69	6.66	6.93
19	24.00	8.89	7.11	8.10
20	24.48	9.20	6.61	8.52
21	22.06	8.29	5.59	9.21
22	22.26	8.57	6.43	9.25
23	21.61	8.47	5.76	7.94
24	21.59	9.00	5.07	6.21
25	22.10	9.57	5.52	9.13
26	19.70	8.65	4.54	4.39
27	20.53	9.78	4.54	
28	19.71	9.69	5.11	11.18
29	21.20	10.63	3.59	
30	20.05	9.51		
31	12.95			
32	9.05			
Bins evaluated with z-criterion	7 to 32	7 to 30	7 to 29	11 to 26 and 28
Task Result	RED	RED	RED	RED

PARTICIPANTS TYPE A, DECISION FOR TASK PC2: Calculation of combined power uncertainty in power curve table		
3542	FAIL	Out of limits deviation for 26 wind speed bins. Z-score > 3 for all the violated bins.
3755	FAIL	Out of limits deviation for 24 wind speed bins. Z-score > 3 for 22/24 of the violated bins.
3856	PASS	Within-limits deviation from median for all results
5417	PASS	Within-limits deviation from median for all results
5492	PASS	Within-limits deviation from median for all results
8069	FAIL	Out of limits deviation for 23 wind speed bins. Z-score > 3 for all the violated bins.
8376	FAIL	Out of limits deviation for 17 wind speed bins. Z-score > 3 for all the violated bins.
8610	PASS	Within-limits deviation from median for all results



Results for participants A. The error bar is ±10% of the median value (the acceptance range).

The table below provides the statistics for the 4 successful participants from Group B:

PARTICIPANTS TYPE B GROUP STATISTICS for Task PC2 – Calculation of combined power uncertainty in power curve table ONLY SUCCESSFUL PARTICIPANTS (4/8)				
Bin	Median	Min	Max	Standard deviation
[-]	[kW]	[kW]	[kW]	[kW]
5	7.1	6.9	7.2	0.1
6	7.5	7.5	7.5	0.0
7	14.7	14.5	14.9	0.2
8	27.6	27.2	28.5	0.5
9	40.0	39.5	41.9	0.9
10	44.4	43.8	46.8	1.2
11	51.5	50.9	54.7	1.5
12	66.0	65.3	70.7	2.2
13	68.5	67.7	73.5	2.3
14	90.3	89.4	97.2	3.1
15	112.1	111.0	121.6	4.3
16	118.2	117.0	128.5	4.7
17	138.0	136.6	149.7	5.3
18	158.0	157.1	173.6	6.9
19	159.9	159.0	175.1	6.7
20	158.4	157.6	173.0	6.4
21	177.3	176.3	194.7	7.7
22	210.4	209.3	230.8	9.0
23	206.5	205.4	226.9	9.0
24	187.6	186.7	205.8	8.0
25	141.9	141.1	155.1	5.8
26	115.1	114.6	127.0	5.2
27	88.3	87.9	96.8	3.7
28	42.4	42.1	46.0	1.6
29	34.5	34.2	37.0	1.1
30	20.5	20.3	21.2	0.3
31	17.6	17.5	17.9	0.1
32	16.8	16.7	17.0	0.1
33	16.0	15.9	16.0	0.0
34	16.0	15.9	16.0	0.0
35	16.0	15.9	16.0	0.0
36	16.3	16.2	16.4	0.1
37	16.2	16.1	16.3	0.1
38	16.0	15.9	16.0	0.0
39	16.0	15.9	16.0	0.0
40	16.1	16.0	16.1	0.0
41	16.0	15.9	16.0	0.0

6.5. Annual Energy Production – Task AEP1

All the participants provided results for task AEP1. The assessed result is the **AEP-measured** value for each of 8 Rayleigh distributions with average speeds 4 to 11 m/s.

The median value is based on the results of all type A participants. No outliers found. The results for all type A participants were identical.

	PARTICIPANTS GROUP STATISTICS for Task AEP1 – Calculation of AEP-measured							
	TYPE A				TYPE B			
Ave Speed	Median	Min	Max	Deviation threshold 0.2% of median for 4, 5 m/s and 0.1% for 6 to 11 m/s	Median	Min	Max	Deviation of median from TYPE A
[m/s]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
4	1 934 282	1 934 282	1 934 282	3869	1 934 282	1 934 089	1 936 574	0
5	3 874 873	3 874 873	3 874 873	7750	3 874 873	3 874 794	3 876 512	0
6	6 235 736	6 235 736	6 235 736	6236	6 236 340	6 235 736	6 237 287	604
7	8 673 733	8 673 733	8 673 733	8674	8 674 194	8 673 733	8 684 472	461
8	10 860 526	10 860 526	10 860 526	10861	10 860 888	10 860 526	10 895 811	362
9	12 576 723	12 576 723	12 576 723	12577	12 577 014	12 576 723	12 652 432	291
10	13 744 277	13 744 277	13 744 277	13744	13 744 515	13 744 277	13 869 607	238
11	14 394 843	14 394 843	14 394 843	14395	14 395 041	14 394 843	14 570 630	198

The outcome of the task is based on an allowable deviation of 0.2% of the median AEP value for wind distributions 4 and 5 m/s and 0.1% of the median AEP value for wind distributions 6, 7,8,9,10 and 11 m/s.

PARTICIPANTS TYPE A RESULTS for Task AEP1 – Calculation of AEP-measured (continued next page)												
Ave Speed	Deviation Limit	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
[m/s]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
4	3869	0	0	0	0	0	0	0	0	0	0	0
5	7750	0	0	0	0	0	0	0	0	0	0	0
6	6236	0	0	0	0	0	0	0	0	0	0	0
7	8674	0	0	0	0	0	0	0	0	0	0	0
8	10861	0	0	0	0	0	0	0	0	0	0	0
9	12577	0	0	0	0	0	0	0	0	0	0	0
10	13744	0	0	0	0	0	0	0	0	0	0	0
11	14395	0	0	0	0	0	0	0	0	0	0	0
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE A RESULTS for Task AEP1 – Calculation of AEP-measured (continued from previous page)											
Ave Speed	Deviation Limit	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
[m/s]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
4	3869	0	0	0	0	0	0	0	0	0	0
5	7750	0	0	0	0	0	0	0	0	0	0
6	6236	0	0	0	0	0	0	0	0	0	0
7	8674	0	0	0	0	0	0	0	0	0	0
8	10861	0	0	0	0	0	0	0	0	0	0
9	12577	0	0	0	0	0	0	0	0	0	0
10	13744	0	0	0	0	0	0	0	0	0	0
11	14395	0	0	0	0	0	0	0	0	0	0
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK AEP1 – Calculation of AEP-measured		
0536	PASS	Zero deviation from median for all wind speeds
2546	PASS	Zero deviation from median for all wind speeds
3652	PASS	Zero deviation from median for all wind speeds
3844	PASS	Zero deviation from median for all wind speeds
4394	PASS	Zero deviation from median for all wind speeds
4680	PASS	Zero deviation from median for all wind speeds
4709	PASS	Zero deviation from median for all wind speeds
5143	PASS	Zero deviation from median for all wind speeds
5481	PASS	Zero deviation from median for all wind speeds
5503	PASS	Zero deviation from median for all wind speeds
6300	PASS	Zero deviation from median for all wind speeds
6857	PASS	Zero deviation from median for all wind speeds
6974	PASS	Zero deviation from median for all wind speeds
8418	PASS	Zero deviation from median for all wind speeds
8547	PASS	Zero deviation from median for all wind speeds
9254	PASS	Zero deviation from median for all wind speeds
9297	PASS	Zero deviation from median for all wind speeds
9398	PASS	Zero deviation from median for all wind speeds
9648	PASS	Zero deviation from median for all wind speeds
9962	PASS	Zero deviation from median for all wind speeds
9974	PASS	Zero deviation from median for all wind speeds

The following tables relate to type B participants. The results exceeding the deviation limit are indicated in orange.

PARTICIPANTS TYPE B RESULTS for Task AEP1 – Calculation of AEP-measured									
Ave Speed	Deviation Limit	3542	3755	3856	5417	5492	8069	8376	8610
[m/s]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
4	3869	-191	-193	0	2292	0	0	0	0
5	7750	-74	-79	0	1639	0	0	0	55
6	6236	1460	1454	0	1208	0	0	0	1551
7	8674	10673	10666	0	921	0	0	0	10739
8	10861	35235	35229	0	723	0	0	0	35285
9	12577	75669	75664	0	581	0	0	0	75709
10	13744	125297	125293	0	476	0	0	0	125330
11	14395	175758	175756	0	396	0	0	0	175787
TASK RESULT		RED	RED	GREEN	GREEN	GREEN	GREEN	GREEN	RED

PARTICIPANTS TYPE B, DECISION FOR TASK AEP1 – Calculation of AEP-measured		
3542	FAIL	Out-of-limit deviation for 5/8 wind speeds
3755	FAIL	Out-of-limit deviation for 5/8 wind speeds
3856	PASS	Zero deviation from median for all wind speeds
5417	PASS	Within-limit deviation from median for all wind speeds
5492	PASS	Zero deviation from median for all wind speeds
8069	PASS	Zero deviation from median for all wind speeds
8376	PASS	Zero deviation from median for all wind speeds
8610	FAIL	Out-of-limit deviation for 5/8 wind speeds

Notes:

Participants 3542, 3755 and 8610 failed task AEP1 because their results violated by more than the 0.1% limit for the Rayleigh wind distributions 7 to 11 m/s.

The results of the failed participants 3542, 3755 and 8610 are almost identical between them. The Coordinator traced the deviation to be attributed to the AEP summation beyond the center value of the last-completed wind speed bin. This is considered to be a wrong interpretation/ implementation of the AEP summation formula of [1].

The small deviations at 4, 5 and 6 m/s for participants 3542 and 3755 were reproduced by the Coordinator to be attributed by a different handling of the first bin summation: according to [1], the summation starts from the 1st completed bin by setting $V_{i-1}=V_i$ -0.5 m/s and $P_{i-1}=0$ kW. Given that the center of the wind speed bin was 2.57 m/s, most participants (all of type A plus 3 from type B) use $V_{i-1}=V_i$ -0.5 m/s = 2.07 m/s, while 3542 and 3755 use the nominal value $V_{i-1}=2.0$ m/s.

The table below provides the statistics for the 5 successful participants from Group B:

PARTICIPANTS GROUP B STATISTICS for Task AEP1 – Calculation of AEP-measured ONLY SUCCESSFUL PARTICIPANTS (5/8)				
Ave Speed	Median	Min	Max	Standard Deviation
[m/s]	[kWh]	[kWh]	[kWh]	[%]
4	1 934 282	1 934 282	1 936 574	0.05
5	3 874 873	3 874 873	3 876 512	0.02
6	6 235 736	6 235 736	6 236 944	0.01
7	8 673 733	8 673 733	8 674 654	0.00
8	10 860 526	10 860 526	10 861 249	0.00
9	12 576 723	12 576 723	12 577 304	0.00
10	13 744 277	13 744 277	13 744 753	0.00
11	14 394 843	14 394 843	14 395 239	0.00

6.6. Annual Energy Production – Task AEP2

All the participants provided results for task AEP2. The assessed result is the **AEP-extrapolated** value for each of 8 Rayleigh distributions with average speeds 4 to 11 m/s.

The median value is based on the results of all type A participants. No outliers found. The results were identical for 20/21 of the type A participants.

The median of type B was identical to the median of type A participants.

PARTICIPANTS GROUP STATISTICS for Task AEP2 – Calculation of AEP-extrapolated								
	TYPE A				TYPE B			
Ave Speed	Median	Min	Max	Deviation threshold 0.2% of median for 4, 5 m/s and 0.1% for 6 to 11 m/s	Median	Min	Max	Deviation of median from TYPE A
[m/s]	[kWh]	[kWh]	[kWh]		[kWh]	[kWh]	[kWh]	[kWh]
4	1 934 283	1 934 283	1 934 283	3869	1 934 283	1 934 089	1 936 574	0
5	3 875 083	3 875 083	3 875 083	7750	3 875 083	3 874 949	3 876 722	0
6	6 243 500	6 243 498	6 243 500	6244	6 243 500	6 243 403	6 244 709	0
7	8 741 477	8 741 463	8 741 477	8741	8 741 477	8 741 404	8 742 398	0
8	11 131 290	11 131 236	11 131 290	11131	11 131 290	11 131 234	11 132 440	0
9	13 259 309	13 259 176	13 259 309	13259	13 259 309	13 259 246	13 261 714	0
10	15 032 284	15 032 037	15 032 284	15032	15 032 284	15 032 163	15 036 283	0
11	16 403 540	16 403 159	16 403 540	16404	16 403 540	16 403 349	16 409 248	0

The outcome of the task is based on an allowable deviation of 0.2% of the median AEP value for wind distributions 4 and 5 m/s and 0.1% of the median AEP value for wind distributions 6, 7,8,9,10 and 11 m/s.

PARTICIPANTS TYPE A RESULTS for Task AEP2 – Calculation of AEP-extrapolated (continued next page)												
Ave Speed	Deviation Limit	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
[m/s]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
4	3869	0	0	0	0	0	0	0	0	0	0	0
5	7750	0	0	0	0	0	0	0	0	0	0	0
6	6244	0	0	0	0	0	0	0	0	-2	0	0
7	8741	0	0	0	0	0	0	0	0	-14	0	0
8	11131	0	0	0	0	0	0	0	0	-54	0	0
9	13259	0	0	0	0	0	0	0	0	-133	0	0
10	15032	0	0	0	0	0	0	0	0	-247	0	0
11	16404	0	0	0	0	0	0	0	0	-381	0	0
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE A RESULTS for Task AEP2 – Calculation of AEP-extrapolated (continued from previous page)											
Ave Speed	Deviation Limit	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
[m/s]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
4	3869	0	0	0	0	0	0	0	0	0	0
5	7750	0	0	0	0	0	0	0	0	0	0
6	6244	0	0	0	0	0	0	0	0	0	0
7	8741	0	0	0	0	0	0	0	0	0	0
8	11131	0	0	0	0	0	0	0	0	0	0
9	13259	0	0	0	0	0	0	0	0	0	0
10	15032	0	0	0	0	0	0	0	0	0	0
11	16404	0	0	0	0	0	0	0	0	0	0
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK AEP2 – Calculation of AEP-extrapolated		
0536	PASS	Zero deviation from median for all wind speeds
2546	PASS	Zero deviation from median for all wind speeds
3652	PASS	Zero deviation from median for all wind speeds
3844	PASS	Zero deviation from median for all wind speeds
4394	PASS	Zero deviation from median for all wind speeds
4680	PASS	Zero deviation from median for all wind speeds
4709	PASS	Zero deviation from median for all wind speeds
5143	PASS	Zero deviation from median for all wind speeds
5481	PASS	Negligible deviation from median for all wind speeds
5503	PASS	Zero deviation from median for all wind speeds
6300	PASS	Zero deviation from median for all wind speeds
6857	PASS	Zero deviation from median for all wind speeds
6974	PASS	Zero deviation from median for all wind speeds
8418	PASS	Zero deviation from median for all wind speeds
8547	PASS	Zero deviation from median for all wind speeds
9254	PASS	Zero deviation from median for all wind speeds
9297	PASS	Zero deviation from median for all wind speeds
9398	PASS	Zero deviation from median for all wind speeds
9648	PASS	Zero deviation from median for all wind speeds
9962	PASS	Zero deviation from median for all wind speeds
9974	PASS	Zero deviation from median for all wind speeds

The following tables relate to type B participants:

PARTICIPANTS TYPE A RESULTS for Task AEP2 – Calculation of AEP-extrapolated									
Ave Speed	Deviation Limit	3542	3755	3856	5417	5492	8069	8376	8610
[m/s]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]	[kWh]
4	3869	-192	-194	0	2291	0	0	0	0
5	7750	-129	-134	0	1639	4	0	0	0
6	6244	-91	-97	-1	1209	69	0	0	0
7	8741	-66	-73	-6	921	383	0	0	0
8	11131	-49	-56	-24	723	1150	0	0	0
9	13259	-38	-45	-63	580	2405	0	0	0
10	15032	-31	-37	-121	475	3999	0	0	0
11	16404	-25	-30	-191	397	5708	0	0	0
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE B, DECISION FOR TASK AEP2 – Calculation of AEP-extrapolated		
3542	PASS	Within limit deviation from median for all wind speeds
3755	PASS	Within limit deviation from median for all wind speeds
3856	PASS	Negligible deviation from median for all wind speeds
5417	PASS	Within limit deviation from median for all wind speeds
5492	PASS	Within limit deviation from median for all wind speeds
8069	PASS	Zero deviation from median for all wind speeds
8376	PASS	Zero deviation from median for all wind speeds
8610	PASS	Zero deviation from median for all wind speeds

6.7. Annual Energy Production – Task AEP3

All the participants provided results for task AEP3. The assessed result is the **AEP-measured uncertainty** value for each of eight (8) Rayleigh distributions with average speeds 4 to 11 m/s.

The median value is based on the results of all type A participants. No outlier has been identified. It is noted that participants 0536, 3844 and 6300 diverge from the group statistics at low wind speed distributions (4 and 5 m/s).

PARTICIPANTS GROUP STATISTICS for Task AEP3 – Calculation of AEP-measured uncertainty										
TYPE A						TYPE B				
Ave Speed	Median	Min	Max	Standard deviation	Deviation threshold 10% of median	Median	Min	Max	Standard deviation	Deviation of median from Type A
[m/s]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
4	13.02	12.08	15.21	0.58	1.30	13.52	9.55	17.58	2.03	0.50
5	9.78	9.45	10.68	0.28	0.98	9.89	7.13	13.83	1.70	0.11
6	7.69	7.63	8.24	0.19	0.77	7.86	5.64	11.17	1.41	0.17
7	6.27	6.18	6.61	0.15	0.63	6.35	4.61	9.15	1.16	0.11
8	5.27	5.12	5.52	0.13	0.53	5.30	3.88	7.64	0.97	0.09
9	4.53	4.37	4.75	0.12	0.45	4.55	3.37	6.53	0.82	0.09
10	3.97	3.83	4.20	0.11	0.40	4.02	3.00	5.73	0.71	0.11
11	3.56	3.44	3.80	0.10	0.36	3.63	2.73	5.14	0.63	0.12

The outcome of the task is based on the combination of two criteria. The primary criterion is based on a maximum allowed deviation of 10% from the median value of the uncertainty at each wind speed distribution. This must be fulfilled for all the 8 assessed values. If the primary criterion is violated in one or more wind distributions (indicated by orange), then the participant is evaluated with the secondary criterion for the violated wind distribution. The secondary criterion is based on the z-score, i.e. it considers the deviation from the median based on the dispersion (standard deviation) of the participants' results.

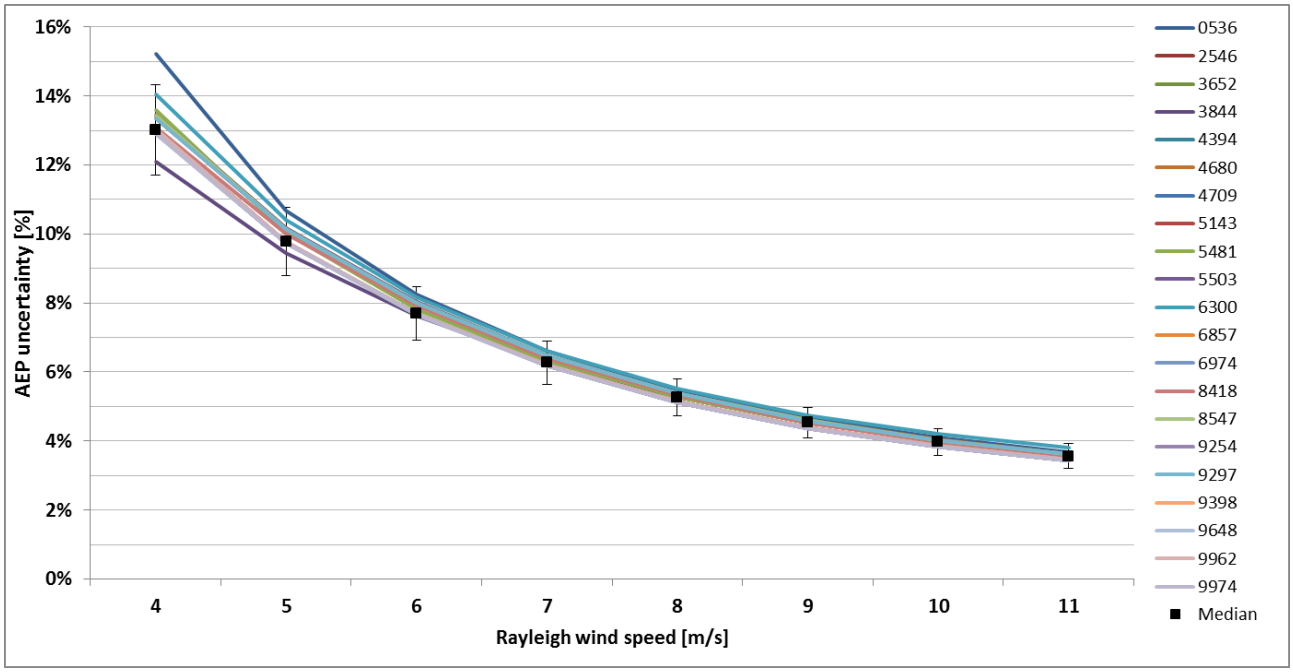
PARTICIPANTS TYPE A RESULTS for Task AEP3 – Calculation of AEP-measured uncertainty Deviation from median value (continued next page)												
Ave Speed	Allowable deviation	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
[m/s]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
4	1.30	2.19	-0.09	0.42	-0.94	0.00	0.43	-0.11	0.32	0.57	0.42	1.03
5	0.98	0.90	-0.03	0.38	-0.33	0.00	0.39	-0.03	0.35	0.25	0.38	0.64
6	0.77	0.55	-0.02	0.33	-0.06	0.00	0.33	-0.02	0.31	0.14	0.33	0.48
7	0.63	0.34	-0.08	0.22	0.00	-0.06	0.22	-0.08	0.21	0.06	0.21	0.34
8	0.53	0.20	-0.14	0.11	0.00	-0.13	0.12	-0.14	0.11	0.00	0.11	0.25
9	0.45	0.13	-0.15	0.07	0.01	-0.14	0.07	-0.15	0.06	0.00	0.07	0.22
10	0.40	0.12	-0.13	0.06	0.04	-0.12	0.07	-0.13	0.05	0.04	0.06	0.23
11	0.36	0.11	-0.12	0.06	0.06	-0.10	0.07	-0.12	0.05	0.07	0.06	0.24
TASK RESULT			GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN
	z-LIMIT	Z-SCORE										
4	3	3.79										
TASK RESULT		RED										

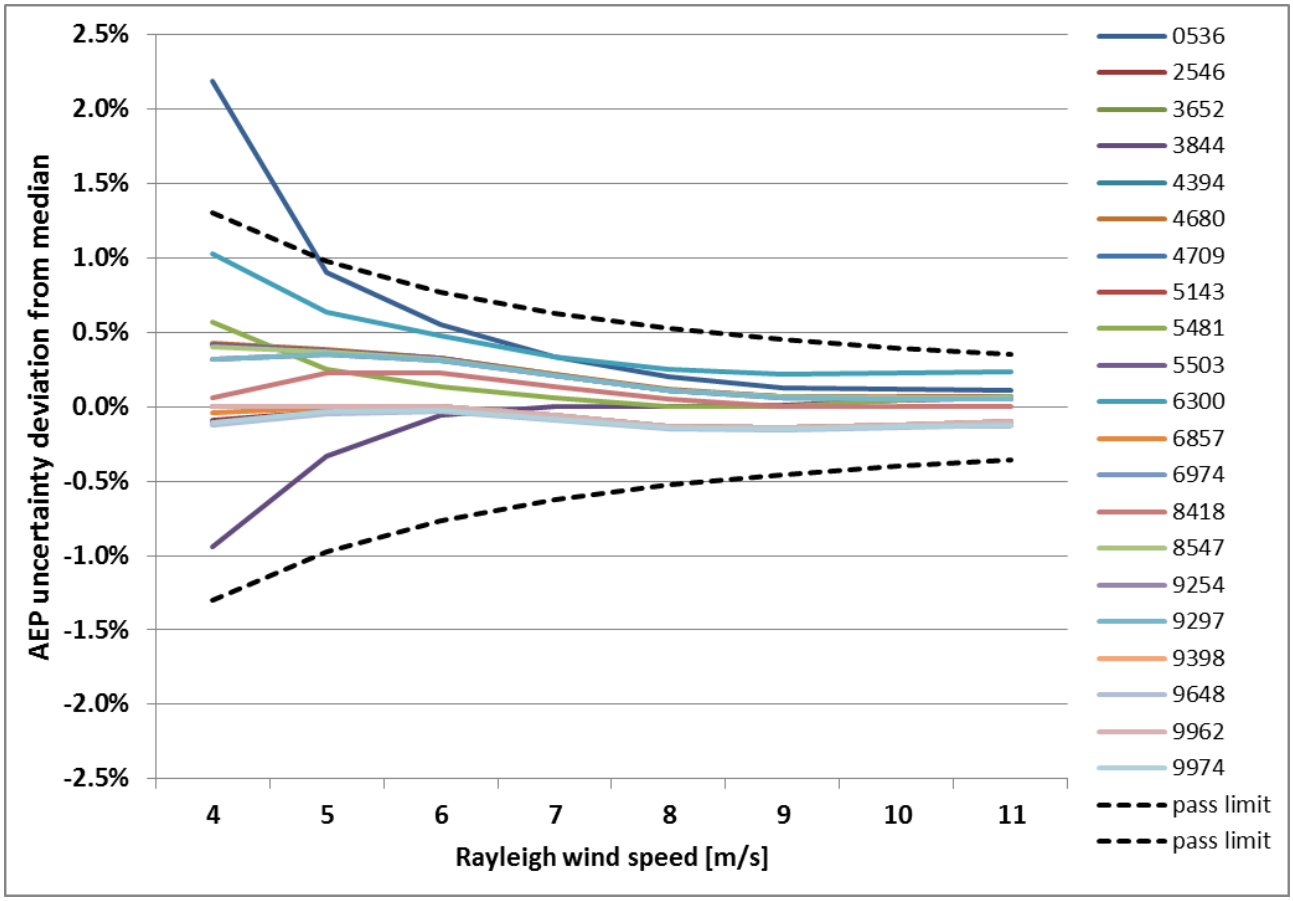
PARTICIPANTS TYPE A RESULTS for Task AEP3 – Calculation of AEP-measured uncertainty Deviation from median value (continued from previous page)											
Ave Speed	Allowable deviation	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
[m/s]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
4	1.30	-0.04	-0.11	0.06	0.40	0.00	0.32	0.00	-0.12	0.00	-0.11
5	0.98	-0.01	-0.03	0.23	0.37	0.00	0.35	0.00	-0.05	0.00	-0.03
6	0.77	-0.01	-0.02	0.23	0.32	0.00	0.31	0.00	-0.03	0.00	-0.02
7	0.63	-0.07	-0.08	0.14	0.21	-0.06	0.21	-0.06	-0.09	-0.06	-0.08
8	0.53	-0.13	-0.14	0.05	0.11	-0.13	0.11	-0.13	-0.15	-0.13	-0.14
9	0.45	-0.14	-0.15	0.00	0.07	-0.14	0.06	-0.14	-0.16	-0.14	-0.15
10	0.40	-0.12	-0.13	0.00	0.06	-0.12	0.05	-0.12	-0.14	-0.12	-0.13
11	0.36	-0.11	-0.12	0.00	0.06	-0.10	0.05	-0.10	-0.12	-0.10	-0.12
TASK RESULT		GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK AEP3 – Calculation of AEP-measured uncertainty		
0536	FAIL	Out-of-limits deviation from median for 1/8 wind speed distribution. Z-score for failed result exceeds 3.
2546	PASS	Within-limits deviation from median for all wind distributions
3652	PASS	Within-limits deviation from median for all wind distributions
3844	PASS	Within-limits deviation from median for all wind distributions
4394	PASS	Within-limits deviation from median for all wind distributions
4680	PASS	Within-limits deviation from median for all wind distributions
4709	PASS	Within-limits deviation from median for all wind distributions
5143	PASS	Within-limits deviation from median for all wind distributions
5481	PASS	Within-limits deviation from median for all wind distributions
5503	PASS	Within-limits deviation from median for all wind distributions
6300	PASS	Within-limits deviation from median for all wind distributions
6857	PASS	Within-limits deviation from median for all wind distributions
6974	PASS	Within-limits deviation from median for all wind distributions
8418	PASS	Within-limits deviation from median for all wind distributions
8547	PASS	Within-limits deviation from median for all wind distributions
9254	PASS	Within-limits deviation from median for all wind distributions
9297	PASS	Within-limits deviation from median for all wind distributions
9398	PASS	Within-limits deviation from median for all wind distributions
9648	PASS	Within-limits deviation from median for all wind distributions
9962	PASS	Within-limits deviation from median for all wind distributions
9974	PASS	Within-limits deviation from median for all wind distributions

It is worth noting that three subgroups of successful participants have been identified:

- Participants 2546, 4394, 4709, 6857, 6974, 9254, 9398, 9648, 9962 and 9974 have provided results equal or practically equal to the median value.
- Participants 3652, 4680, 5503, 8547 have provided almost identical results.
- Participants 5143 and 9297 have provided identical results, close to the 2nd sub-group.





Results for participants A. The error bar in the upper plot is ±10% of the median value (the acceptance range).

The table below provides the statistics for the 20 successful participants from Group A:

PARTICIPANTS GROUP STATISTICS for Task AEP3 – Calculation of AEP-measured uncertainty ONLY SUCCESSFUL PARTICIPANTS (20/21)				
Ave Speed	Median	Min	Max	Standard deviation
[m/s]	[%]	[%]	[%]	[%]
4	13.02	12.08	14.05	0.38
5	9.78	9.45	10.42	0.23
6	7.69	7.63	8.17	0.17
7	6.24	6.18	6.61	0.14
8	5.21	5.12	5.52	0.13
9	4.46	4.37	4.75	0.11
10	3.91	3.83	4.20	0.10
11	3.51	3.44	3.80	0.10

The following tables relate to type B participants. The deviations exceeding the allowed limit are indicated in orange.

PARTICIPANTS TYPE B RESULTS for Task AEP3 – Calculation of AEP-measured uncertainty, Deviation from median value									
Ave Speed	Allowable deviation	3542	3755	3856	5417	5492	8069	8376	8610
[m/s]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
4	1.30	0.78	4.56	0.42	0.58	-0.11	0.64	-3.47	-0.11
5	0.98	0.48	4.05	0.38	0.25	-0.03	-0.06	-2.65	-0.03
6	0.77	0.35	3.48	0.33	0.15	-0.02	0.19	-2.05	-0.02
7	0.63	0.23	2.88	0.22	0.06	-0.08	0.10	-1.66	-0.08
8	0.53	0.15	2.37	0.11	0.01	-0.14	0.04	-1.39	-0.15
9	0.45	0.12	2.00	0.07	0.01	-0.15	0.03	-1.16	-0.18
10	0.40	0.13	1.76	0.06	0.04	-0.13	0.06	-0.97	-0.17
11	0.36	0.14	1.58	0.06	0.07	-0.12	0.09	-0.83	-0.16
TASK RESULT		GREEN		GREEN	GREEN	GREEN	GREEN		GREEN
	z-LIMIT		Z-SCORE					Z-SCORE	
4	3		7.89					6.01	
5	3		17.56					11.53	
6	3		20.19					11.90	
7	3		20.26					11.69	
8	3		19.26					11.19	
9	3		18.11					10.35	
10	3		17.19					9.20	
11	3		16.30					8.18	
TASK RESULT			RED					RED	

The type B participants 3542, 3856, 5417, 5492, 8069 and 8610 have succeeded in task AEP3 based on the primary criterion. Participants 3755 and 8376 have failed the primary criterion in 8/8 results and have been assessed with the z-score criterion for these results. The z-values

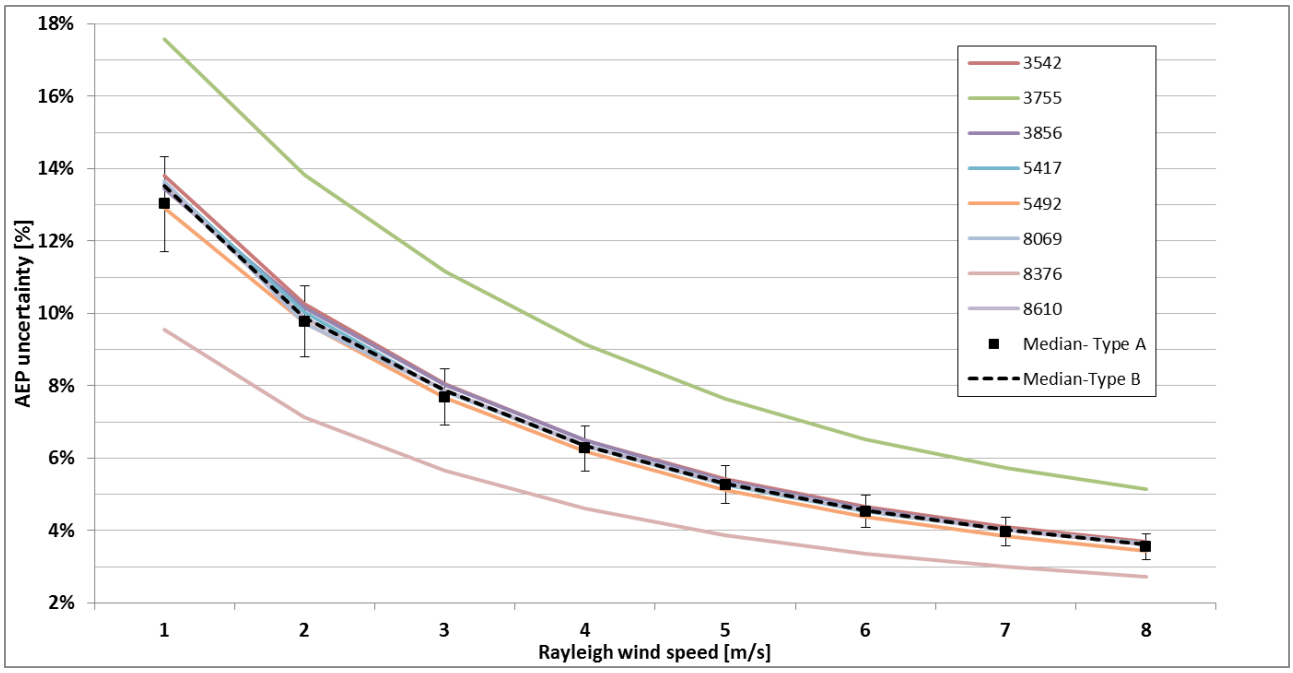
exceed 3, leading to a violation of the secondary criterion; the task result for 3755 and 8376 is not-successful.

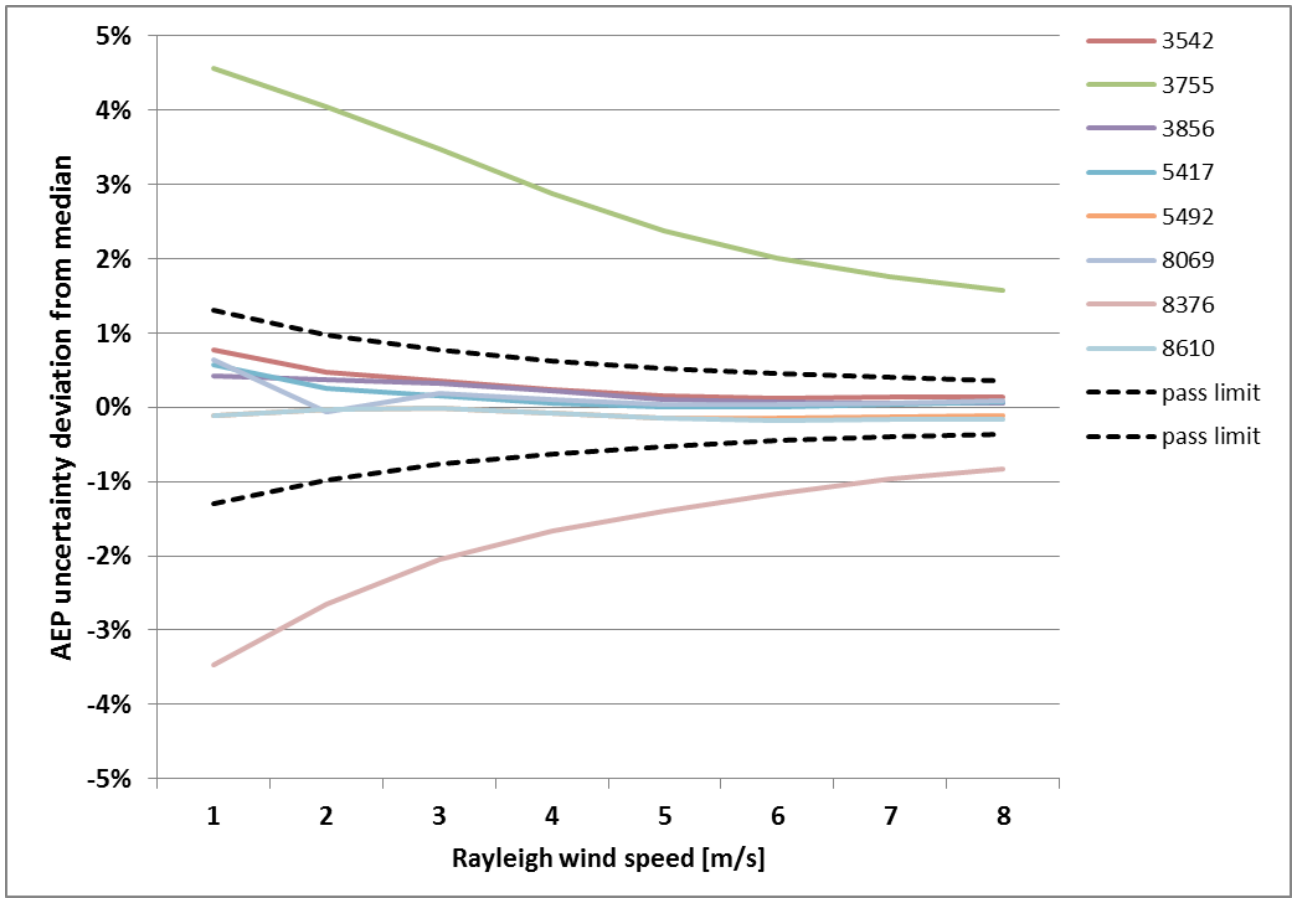
The Coordinator traced the cause of the deviation of 3755 in the wrong calculation of the sensitivity c_T for temperature. The reported value was about one order of magnitude larger than all the other Participants. The error is in the use of wrong units for relative humidity φ in the respective formula: instead of using values in the range 0 to 1, Participant 3755 applied values in the range 0 to 100 leading to a much larger value for c_T compared to the correct one.

PARTICIPANTS TYPE B, DECISION FOR TASK AEP3 – Calculation of AEP-measured uncertainty		
3542	PASS	Within-limits deviation from median for all wind distributions
3755	FAIL	Out-of-limits deviation from median for 8/8 wind speed distribution. Z-score for failed results exceeds 3.
3856	PASS	Within-limits deviation from median for all wind distributions
5417	PASS	Within-limits deviation from median for all wind distributions
5492	PASS	Within-limits deviation from median for all wind distributions
8069	PASS	Within-limits deviation from median for all wind distributions
8376	FAIL	Out-of-limits deviation from median for 8/8 wind speed distribution. Z-score for failed results exceeds 3.
8610	PASS	Within-limits deviation from median for all wind distributions

The table below provides the statistics for the 6 successful participants from Group B:

PARTICIPANTS GROUP STATISTICS for Task AEP3 – Calculation of AEP-measured uncertainty ONLY SUCCESSFUL PARTICIPANTS (6/8)				
Ave Speed	Median	Min	Max	Standard deviation
[m/s]	[%]	[%]	[%]	[%]
4	13.52	12.91	13.80	0.35
5	9.89	9.72	10.26	0.22
6	7.86	7.67	8.04	0.15
7	6.35	6.19	6.50	0.13
8	5.30	5.12	5.42	0.11
9	4.55	4.35	4.65	0.11
10	4.02	3.80	4.10	0.11
11	3.63	3.40	3.70	0.11





Results for participants B. The error bar in the upper plot is ±10% of the median value (the acceptance range).

6.8. Data Filtering –Task DF1

All the participants provided results for task DF1. The results of all 21 type A participants and 8 type B participants were identical in all aspects, also beyond the formal results to be assessed.

The assessed result is the number of records within each wind speed bin of the power curve table. The assessed range is from the 6th bin to the 50th bin (i.e. 3 m/s to 25 m/s, i.e. the grey-shaded cells). Data records existed in all bins from 1 m/s to 22.5 m/s.

PARTICIPANTS TYPE A GROUP STATISTICS for Task DF1 – Data Filtering							
PARTICIPANTS TYPE B GROUP STATISTICS for Task DF1 – Data Filtering							
	RESULTS – Identical for each participant and equal to the median values			Deviations from median, Same for **ALL** participants			
Bin	v	P	n	v	P	n	**Task Result**
[-]	[m/s]	[kW]	[-]	[m/s]	[kW]	[-]	**ALL PARTICIPANTS**
2	1.03	-12.6	5	0.00	0.0	0	Not assessed
3	1.56	-12.1	18	0.00	0.0	0	Not assessed
4	2.05	-12.0	10	0.00	0.0	0	Not assessed
5	2.50	-11.9	28	0.00	0.0	0	Not assessed
6	2.99	-12.0	39	0.00	0.0	0	GREEN
7	3.46	10.4	32	0.00	0.0	0	GREEN
8	4.01	73.6	40	0.00	0.0	0	GREEN
9	4.50	123.9	45	0.00	0.0	0	GREEN
10	5.00	208.3	20	0.00	0.0	0	GREEN
11	5.55	295.4	45	0.00	0.0	0	GREEN
12	6.00	379.5	91	0.00	0.0	0	GREEN
13	6.51	490.2	119	0.00	0.0	0	GREEN
14	6.99	640.0	116	0.00	0.0	0	GREEN
15	7.52	799.1	114	0.00	0.0	0	GREEN
16	8.00	971.7	110	0.00	0.0	0	GREEN
17	8.48	1132.4	107	0.00	0.0	0	GREEN
18	8.99	1355.3	101	0.00	0.0	0	GREEN
19	9.49	1606.9	112	0.00	0.0	0	GREEN
20	10.00	1824.4	108	0.00	0.0	0	GREEN
21	10.49	2049.2	65	0.00	0.0	0	GREEN
22	10.99	2271.8	49	0.00	0.0	0	GREEN
23	11.48	2421.4	42	0.00	0.0	0	GREEN
24	12.02	2630.6	33	0.00	0.0	0	GREEN
25	12.52	2799.9	34	0.00	0.0	0	GREEN
26	12.98	2871.6	25	0.00	0.0	0	GREEN
27	13.54	2973.4	14	0.00	0.0	0	GREEN
28	14.00	2972.8	22	0.00	0.0	0	GREEN
29	14.53	2990.0	27	0.00	0.0	0	GREEN
30	15.01	2988.5	16	0.00	0.0	0	GREEN
31	15.51	2994.7	25	0.00	0.0	0	GREEN
32	16.01	2994.3	14	0.00	0.0	0	GREEN
33	16.49	2992.6	20	0.00	0.0	0	GREEN
34	17.00	2995.9	9	0.00	0.0	0	GREEN
35	17.51	2995.2	18	0.00	0.0	0	GREEN
36	18.01	2994.5	15	0.00	0.0	0	GREEN
37	18.49	2994.8	11	0.00	0.0	0	GREEN

PARTICIPANTS TYPE A GROUP STATISTICS for Task DF1 – Data Filtering							
PARTICIPANTS TYPE B GROUP STATISTICS for Task DF1 – Data Filtering							
	RESULTS – Identical for each participant and equal to the median values			Deviations from median, Same for **ALL** participants			
Bin	v	P	n	v	P	n	**Task Result**
[-]	[m/s]	[kW]	[-]	[m/s]	[kW]	[-]	**ALL PARTICIPANTS**
38	19.08	2994.7	13	0.00	0.0	0	GREEN
39	19.51	2995.1	25	0.00	0.0	0	GREEN
40	19.98	2995.1	24	0.00	0.0	0	GREEN
41	20.45	2995.3	16	0.00	0.0	0	GREEN
42	20.87	2995.5	8	0.00	0.0	0	GREEN
43	21.48	2994.6	2	0.00	0.0	0	GREEN
44	21.94	2993.6	8	0.00	0.0	0	GREEN
45	22.25	2994.5	1	0.00	0.0	0	GREEN

The outcome of the task is based on a maximum allowed deviation of 1 record from the median value for each of the assessed wind speed bins. If the deviation is up to 3 records, then the result is flagged as YELLOW.

PARTICIPANTS TYPE A, DECISION FOR TASK DF1- Data Filtering		
0536	PASS	Zero deviation from median for all results
2546	PASS	Zero deviation from median for all results
3652	PASS	Zero deviation from median for all results
3844	PASS	Zero deviation from median for all results
4394	PASS	Zero deviation from median for all results
4680	PASS	Zero deviation from median for all results
4709	PASS	Zero deviation from median for all results
5143	PASS	Zero deviation from median for all results
5481	PASS	Zero deviation from median for all results
5503	PASS	Zero deviation from median for all results
6300	PASS	Zero deviation from median for all results
6857	PASS	Zero deviation from median for all results
6974	PASS	Zero deviation from median for all results
8418	PASS	Zero deviation from median for all results
8547	PASS	Zero deviation from median for all results
9254	PASS	Zero deviation from median for all results
9297	PASS	Zero deviation from median for all results
9398	PASS	Zero deviation from median for all results
9648	PASS	Zero deviation from median for all results
9962	PASS	Zero deviation from median for all results
9974	PASS	Zero deviation from median for all results

PARTICIPANTS TYPE B, DECISION FOR TASK DF1- Data Filtering		
3542	PASS	Zero deviation from median for all results
3755	PASS	Zero deviation from median for all results
3856	PASS	Zero deviation from median for all results
5417	PASS	Zero deviation from median for all results
5492	PASS	Zero deviation from median for all results
8069	PASS	Zero deviation from median for all results
8376	PASS	Zero deviation from median for all results
8610	PASS	Zero deviation from median for all results

6.9. In Situ comparison – Task IS1

All the participants provided results for task IS1. The assessed results are the values of the expanded difference (quadratic sum of systematic deviation and statistical uncertainty δ) of anemometer wind speed in 8 wind speed bins, i.e. the assessed results are 8.

The median value is based on the results of all type A participants. No outliers found.

The outcome of the task is based on a maximum allowed deviation of 0.01 m/s from the median value of δ in each of the 8 wind speed bins. The deviating results are indicated in orange.

PARTICIPANTS GROUP STATISTICS for Task IS1 – In Situ comparison Expanded δ-value					
	TYPE A GROUP		TYPE B GROUP		
Wind speed Bin [m/s]	Median δ [m/s]	Std.Dev. of δ [m/s]	Median δ [m/s]	Std.Dev. of δ [m/s]	Difference from median of Type A
[4,5)	0.038	0.009	0.038	0.005	0.000
[5,6)	0.032	0.005	0.032	0.009	0.000
[6,7)	0.053	0.005	0.053	0.019	0.000
[7,8)	0.078	0.004	0.078	0.031	0.000
[8,9)	0.036	0.007	0.036	0.013	0.000
[9,10)	0.075	0.005	0.075	0.031	0.000
[10,11)	0.094	0.004	0.094	0.030	0.000
[11,12)	0.091	0.007	0.091	0.028	0.000

	PARTICIPANTS TYPE A RESULTS for Task IS1 – In Situ comparison (continued in next page) Deviation from median δ value [m/s] – Maximum allowed deviation 0.01 m/s for no more than one wind speed bin										
Wind speed Bin [m/s]	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
[4,5)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.038	0.011
[5,6)	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.013	0.016
[6,7)	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.013	0.017
[7,8)	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.008	0.017
[8,9)	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.029	0.011
[9,10)	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000	0.012	0.017
[10,11)	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.018
[11,12)	0.000	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.013	0.017
TEST RESULT	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED	RED

	PARTICIPANTS TYPE A RESULTS for Task IS1 – In Situ comparison (continued from previous page) Deviation from median δ value [m/s] – Maximum allowed deviation 0.01 m/s for no more than one wind speed bin									
Wind speed Bin [m/s]	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
[4,5)	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
[5,6)	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.001	0.000
[6,7)	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.001	0.000
[7,8)	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.003	0.000
[8,9)	0.000	0.000	0.012	0.000	0.000	0.000	0.000	0.000	0.001	0.000
[9,10)	0.000	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.002	0.000
[10,11)	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.000	0.001	0.000
[11,12)	0.000	0.000	0.022	0.000	0.000	0.000	0.000	0.000	0.001	0.000
TEST RESULT	GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK IS1: In Situ Comparison		
0536	PASS	Zero deviation from median for all results
2546	PASS	Zero deviation from median for all results
3652	PASS	Zero deviation from median for all results
3844	PASS	Within limits deviation from median for all results
4394	PASS	Zero deviation from median for all results
4680	PASS	Zero deviation from median for all results
4709	PASS	Zero deviation from median for all results
5143	PASS	Zero deviation from median for all results
5481	PASS	Zero deviation from median for all results
5503	FAIL	Out-of-limit deviation from median in 6/8 wind speed bins
6300	FAIL	Out-of-limit deviation from median in ALL wind speed bins
6857	PASS	Zero deviation from median for all results
6974	PASS	Zero deviation from median for all results
8418	FAIL	Out-of-limit deviation from median in two wind speed bins
8547	PASS	Zero deviation from median for all results
9254	PASS	Zero deviation from median for all results
9297	PASS	Zero deviation from median for all results
9398	PASS	Zero deviation from median for all results
9648	PASS	Zero deviation from median for all results
9962	PASS	Within limits deviation from median for all results
9974	PASS	Zero deviation from median for all results

The table below provides the statistics for the 18 successful participants from Group A:

PARTICIPANTS TYPE A GROUP STATISTICS for Task IS1 – In Situ Comparison ONLY SUCCESSFUL PARTICIPANTS (18/21)				
Wind speed Bin [m/s]	Median δ [m/s]	Min [m/s]	Max [m/s]	Std.Dev. of δ [m/s]
[4,5)	0.038	0.038	0.038	0.000
[5,6)	0.032	0.032	0.033	0.000
[6,7)	0.053	0.053	0.054	0.000
[7,8)	0.078	0.078	0.081	0.001
[8,9)	0.036	0.036	0.037	0.000
[9,10)	0.075	0.075	0.077	0.001
[10,11)	0.094	0.094	0.095	0.000
[11,12)	0.091	0.091	0.092	0.000

The following tables relate to type B participants. The deviating results are indicated in orange.

	PARTICIPANTS TYPE B RESULTS for Task IS1 – In Situ comparison Deviation from median δ value [m/s] – Maximum allowed deviation 0.01 m/s for no more than one wind speed bin							
Wind speed Bin [m/s]	3542	3755	3856	5417	5492	8069	8376	8610
[4,5)	0.009	0.000	0.000	0.000	0.000	0.000	0.010	0.011
[5,6)	0.015	0.000	0.000	0.000	0.000	0.000	0.001	0.026
[6,7)	0.048	0.000	0.000	0.000	0.000	0.000	0.003	0.040
[7,8)	0.074	0.000	0.000	0.000	0.000	0.000	0.003	0.072
[8,9)	0.027	0.000	0.000	0.000	0.000	0.000	0.007	0.032
[9,10)	0.045	0.000	0.000	0.000	0.000	0.000	0.033	0.071
[10,11)	0.038	0.000	0.000	0.000	0.000	0.000	0.001	0.088
[11,12)	0.045	0.000	0.000	0.000	0.000	0.000	0.001	0.077
TEST RESULT	RED	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	RED

PARTICIPANTS TYPE B, DECISION FOR TASK IS1: In Situ Comparison		
3542	FAIL	Out-of-limit deviation from median in 7/8 wind speed bins
3755	PASS	Zero deviation from median for all results
3856	PASS	Zero deviation from median for all results
5417	PASS	Zero deviation from median for all results
5492	PASS	Zero deviation from median for all results
8069	PASS	Zero deviation from median for all results
8376	YELLOW	Out-of-limit deviation from median in 1/8 wind speed bins. The maximum number of deviating bins before RED condition is 1.
8610	FAIL	Out-of-limit deviation from median in ALL wind speed bins

The table below provides the statistics for the 5 successful participants from Group B:

PARTICIPANTS TYPE B GROUP STATISTICS for Task IS1 – In Situ Comparison ONLY SUCCESSFUL PARTICIPANTS (5/8)				
Wind speed Bin [m/s]	Median δ [m/s]	Min [m/s]	Max [m/s]	Std.Dev. of δ [m/s]
[4,5)	0.038	0.038	0.038	0.000
[5,6)	0.032	0.032	0.032	0.000
[6,7)	0.053	0.053	0.053	0.000
[7,8)	0.078	0.078	0.078	0.000
[8,9)	0.036	0.036	0.036	0.000
[9,10)	0.075	0.075	0.075	0.000
[10,11)	0.094	0.094	0.094	0.000
[11,12)	0.091	0.091	0.091	0.000

6.10. Terrain Assessment – Task TA1

All the participants provided results for task TA1. The assessed results are the Maximum Slope [%] and Maximum Terrain Variation [m] in each of the distance circles for each of the Test Turbine and Reference Mast according to Annex B of [1].

The median value is based on the results of all type A participants. No outliers found. A total of 5+5+3+3=16 calculations are assessed.

PARTICIPANTS TYPE A GROUP STATISTICS for Task TA1 – Terrain Assessment						PARTICIPANTS TYPE B GROUP STATISTICS for Task TA1 – Terrain Assessment				
Maximum Slope – Test Turbine						Maximum Slope – Test Turbine				
Distance	Sector	Median	Min	Max	Std. Dev.	Median	Min	Max	Std. Dev.	Deviation of median from TYPE A
		[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	360º	13.5	13.2	22.2	1.9	13.5	13.3	24.2	3.8	0.0
[2L, 4L)	Meas. Sector	15.6	15.5	25.5	2.1	15.6	15.5	29.8	5.0	0.0
[2L, 4L)	Outside	28.6	27.7	29.3	0.3	28.6	28.3	29.9	0.5	0.0
[4L, 8L)	Meas. Sector	13.2	13.2	25.3	2.6	13.2	13.2	30.6	6.1	0.0
[8L, 16L)	Meas. Sector	23.7	23.6	24.1	0.1	23.7	23.6	23.7	0.0	0.0
Maximum Slope – Reference Mast						Maximum Slope – Reference Mast				
Distance	Sector	Median	Min	Max	Std. Dev.	Median	Min	Max	Std. Dev.	Deviation of median from TYPE A
		[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	360º	11.4	11.3	18.1	1.4	11.4	11.2	20.2	3.1	0.0
[2L, 4L)	Meas. Sector	16.1	16.0	21.5	1.2	16.1	15.7	22.4	2.3	0.0
[2L, 4L)	Outside	20.9	20.7	21.3	0.1	20.9	20.8	21.0	0.1	0.0
[4L, 8L)	Meas. Sector	13.0	13.0	21.9	1.9	13.0	12.9	26.1	4.6	0.0
[8L, 16L)	Meas. Sector	22.9	22.9	23.3	0.1	22.9	22.8	23.1	0.1	0.0
Max Terrain Variation from plane – Test Turbine						Max Terrain Variation from plane – Test Turbine				
Distance	Sector	Median	Min	Max	Std. Dev.	Median	Min	Max	Std. Dev.	Deviation of median from TYPE A
		[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	360º	62.5	29.0	63.8	7.3	62.1	20.8	185.8	47.8	-0.4
[2L, 4L)	Meas. Sector	181.8	116.5	191.6	15.5	188.6	42.2	191.1	50.8	6.8
[4L, 8L)	Meas. Sector	444.6	176.1	445.8	57.2	443.0	95.7	445.2	121.7	-1.6
Max Terrain Variation from plane – Ref Mast						Max Terrain Variation from plane – Ref Mast				
Distance	Sector	Median	Min	Max	Std. Dev.	Median	Min	Max	Std. Dev.	Deviation of median from TYPE A
		[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	360º	47.8	26.5	48.6	4.6	47.8	18.9	182.6	49.9	0.0
[2L, 4L)	Meas. Sector	130.0	83.6	131.9	10.0	130.2	56.9	136.9	26.0	0.2
[4L, 8L)	Meas. Sector	358.8	200.9	378.8	34.1	358.8	127.5	399.6	86.1	0.0

The outcome of the task is based on the z-score, i.e. it considers the deviation from the median based on the dispersion (standard deviation) of the participants' results. The acceptance limit is $z \leq 2$. The z-score is calculated for each of the *slope* and *max deviation* values in each of the distance circles (16 assessed results). The deviations exceeding the threshold are indicated in yellow.

PARTICIPANTS TYPE A GROUP RESULTS for Task TA1 - Terrain Assessment (continued in next page)												
Maximum Slope – Test Turbine												
Distance	Median	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	13.5	13.3	22.2	13.5	13.5	13.5	13.7	13.5	13.5	13.5	13.2	13.5
[2L, 4L)-in	15.6	15.6	25.5	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.5	15.6
[2L, 4L)-out	28.6	28.6	27.7	28.6	28.5	28.6	29.0	28.6	28.5	28.6	28.5	28.5
[4L, 8L)	13.2	13.2	25.3	13.2	13.2	13.2	13.3	13.2	13.2	13.2	13.2	13.3
[8L, 16L)	23.7	23.7	23.7	23.7	23.6	23.7	23.7	23.7	23.6	23.7	23.7	23.6
Maximum Slope – Reference Mast												
Distance	Median	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	11.4	11.4	18.1	11.4	11.4	11.4	11.5	11.4	11.4	11.4	11.3	11.4
[2L, 4L)-in	16.1	16.0	21.5	16.1	16.1	16.1	16.1	16.1	16.1	16.1	16.0	16.1
[2L, 4L)-out	20.9	20.9	20.8	20.9	20.9	20.9	21.3	20.7	20.9	20.9	20.8	20.9
[4L, 8L)	13.0	13.0	21.9	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
[8L, 16L)	22.9	22.9	23.1	22.9	22.9	22.9	23.1	23.0	22.9	22.9	22.9	22.9
Max Terrain Variation from plane – Test Turbine												
Distance	Median	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	62.5	63.4	29.0	62.5	61.8	62.5	62.4	62.5	61.6	62.5	63.0	61.6
[2L, 4L)-in	181.8	191.1	116.5	181.8	190.4	191.6	190.3	181.7	180.2	181.8	180.2	190.1
[4L, 8L)	444.6	444.5	176.1	445.2	443.8	445.0	445.8	445.2	443.7	445.2	444.6	443.5
Max Terrain Variation from plane – Reference Mast												
Distance	Median	0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	47.8	48.1	26.5	47.8	47.9	47.8	48.6	47.8	48.4	47.8	47.5	48.4
[2L, 4L)-in	130.0	130.3	83.6	130.0	130.2	130.0	131.9	130.0	131.0	130.0	129.5	131.0
[4L, 8L)	358.8	358.3	200.9	358.8	359.0	358.7	378.8	358.8	359.9	358.8	358.5	359.8

PARTICIPANTS TYPE A GROUP RESULTS for Task TA1 - Terrain Assessment (continued from previous page)											
Maximum Slope – Test Turbine											
Distance	Median	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	13.5	13.5	13.7	13.5	13.5	13.5	13.3	13.5	13.3	13.5	13.5
[2L, 4L)-in	15.6	15.6	15.8	15.6	15.6	15.6	15.6	15.6	15.6	15.6	15.6
[2L, 4L)-out	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	28.6	29.3	28.5
[4L, 8L)	13.2	13.2	13.4	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2
[8L, 16L)	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	24.1	23.6
Maximum Slope – Reference Mast											
Distance	Median	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	11.4	11.4	11.5	11.4	11.4	11.4	11.4	11.4	11.3	11.4	11.4
[2L, 4L)-in	16.1	16.1	16.2	16.1	16.1	16.1	16.0	16.1	16.0	16.1	16.1
[2L, 4L)-out	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	20.9	21.3	20.9
[4L, 8L)	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
[8L, 16L)	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	22.9	23.3	22.9
Max Terrain Variation from plane – Test Turbine											
Distance	Median	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	62.5	62.5	61.8	62.5	62.5	62.5	63.8	62.6	63.4	61.6	61.6
[2L, 4L)-in	181.8	181.8	180.6	181.7	181.8	191.5	191.1	181.8	191.1	190.1	190.1
[4L, 8L)	444.6	445.2	442.5	445.2	445.2	444.9	444.5	445.1	444.5	443.5	443.5
Max Terrain Variation from plane – Reference Mast											
Distance	Median	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	47.8	47.8	47.6	47.8	47.8	47.7	48.0	47.8	48.1	48.4	48.4
[2L, 4L)-in	130.0	130.0	128.0	130.0	130.0	129.9	130.2	129.9	130.2	131.0	131.0
[4L, 8L)	358.8	358.9	356.4	358.8	358.8	358.7	358.4	358.8	358.4	359.8	359.8

PARTICIPANTS TYPE A GROUP RESULTS for Task TA1 - Terrain Assessment																				
Z-Scores – Limit value 2																				
0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
Maximum Slope – Test Turbine																				
0.11	4.67	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.16	0.01	0.00	0.11	0.00	0.00	0.00	0.11	0.00	0.11	0.00	0.01
0.00	4.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.00	3.36	0.00	0.37	0.00	1.49	0.00	0.37	0.00	0.37	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.61	0.36
0.00	4.70	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.02	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
0.00	0.00	0.00	1.05	0.00	0.00	0.00	1.05	0.00	0.00	0.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.21	0.72
Maximum Slope – Reference Mast																				
0.00	4.70	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.07	0.02	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.02
0.09	4.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.03	0.00	0.09	0.00	0.00	0.00	0.09	0.00	0.09	0.00	0.02
0.00	0.75	0.00	0.00	0.00	3.00	1.50	0.00	0.00	0.75	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.32
0.00	4.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
0.00	2.00	0.00	0.00	0.00	2.00	1.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	0.09
Max Terrain Variation from plane – Test Turbine																				
0.12	4.58	0.00	0.10	0.00	0.01	0.00	0.12	0.00	0.07	0.13	0.00	0.10	0.00	0.00	0.00	0.18	0.01	0.12	0.12	0.13
0.60	4.21	0.00	0.55	0.63	0.55	0.01	0.10	0.00	0.10	0.54	0.00	0.08	0.01	0.00	0.63	0.60	0.00	0.60	0.54	0.53
0.00	4.70	0.01	0.01	0.01	0.02	0.01	0.02	0.01	0.00	0.02	0.01	0.04	0.01	0.01	0.01	0.00	0.01	0.00	0.02	0.02
Max Terrain Variation from plane – Reference Mast																				
0.07	4.65	0.00	0.02	0.00	0.17	0.00	0.13	0.00	0.07	0.13	0.00	0.04	0.00	0.00	0.02	0.04	0.00	0.07	0.13	0.14
0.03	4.66	0.00	0.02	0.00	0.19	0.00	0.10	0.00	0.05	0.10	0.00	0.20	0.00	0.00	0.01	0.02	0.01	0.02	0.10	0.10
0.01	4.63	0.00	0.01	0.00	0.59	0.00	0.03	0.00	0.01	0.03	0.00	0.07	0.00	0.00	0.00	0.01	0.00	0.01	0.03	0.03
Task Result per Participant																				
0536	2546	3652	3844	4394	4680	4709	5143	5481	5503	6300	6857	6974	8418	8547	9254	9297	9398	9648	9962	9974
GREEN	YELLOW	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK TA1: Terrain Assessment		
0536	PASS	Acceptable z-score for all results
2546	YELLOW	Z-limit exceeded for 14/16 results
3652	PASS	Acceptable z-score for all results
3844	PASS	Acceptable z-score for all results
4394	PASS	Acceptable z-score for all results
4680	YELLOW	Z-limit exceeded for 2/16 results
4709	PASS	Acceptable z-score for all results
5143	PASS	Acceptable z-score for all results
5481	PASS	Acceptable z-score for all results
5503	PASS	Acceptable z-score for all results
6300	PASS	Acceptable z-score for all results
6857	PASS	Acceptable z-score for all results
6974	PASS	Acceptable z-score for all results
8418	PASS	Acceptable z-score for all results
8547	PASS	Acceptable z-score for all results
9254	PASS	Acceptable z-score for all results
9297	PASS	Acceptable z-score for all results
9398	PASS	Acceptable z-score for all results
9648	PASS	Acceptable z-score for all results
9962	YELLOW	Z-limit exceeded for 4/16 results
9974	PASS	Acceptable z-score for all results

The table below provides the statistics for the 18 successful participants from Group A:

PARTICIPANTS TYPE A GROUP STATISTICS for Task TA1 – Terrain Assessment ONLY SUCCESSFUL PARTICIPANTS (18/21)					
Maximum Slope – Test Turbine					
Distance	Sector	Median	Min	Max	Std. Dev.
		[%]	[%]	[%]	[%]
< 2L	360º	13.5	13.2	13.7	0.1
[2L, 4L)	Meas. Sector	15.6	15.5	15.8	0.1
[2L, 4L)	Outside Meas. Sector	28.6	28.5	28.6	0.0
[4L, 8L)	Meas. Sector	13.2	13.2	13.4	0.0
[8L, 16L)	Meas. Sector	23.7	23.6	23.7	0.0
Maximum Slope – Reference Mast					
Distance	Sector	Median	Min	Max	Std. Dev.
		[%]	[%]	[%]	[%]
< 2L	360º	11.4	11.3	11.5	0.0
[2L, 4L)	Meas. Sector	16.1	16.0	16.2	0.1
[2L, 4L)	Outside Meas. Sector	20.9	20.7	20.9	0.1
[4L, 8L)	Meas. Sector	13.0	13.0	13.0	0.0
[8L, 16L)	Meas. Sector	22.9	22.9	23.0	0.0
Max Terrain Variation from plane – Test Turbine					
Distance	Sector	Median	Min	Max	Std. Dev.
		[m]	[m]	[m]	[m]
< 2L	360º	62.5	61.6	63.8	0.6
[2L, 4L)	Meas. Sector	181.8	180.2	191.6	4.8
[4L, 8L)	Meas. Sector	444.6	442.5	445.2	0.8
Max Terrain Variation from plane – Ref Mast					
Distance	Sector	Median	Min	Max	Std. Dev.
		[m]	[m]	[m]	[m]
< 2L	360º	47.8	47.5	48.4	0.3
[2L, 4L)	Meas. Sector	130.0	128.0	131.0	0.6
[4L, 8L)	Meas. Sector	358.8	356.4	359.9	0.7

The following tables relate to type B participants. The deviations exceeding the threshold are indicated in yellow.

PARTICIPANTS TYPE B GROUP RESULTS for Task TA1 - Terrain Assessment									
Maximum Slope – Test Turbine									
Distance	Median	3542	3755	3856	5417	5492	8069	8376	8610
	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	13.5	13.3	13.5	13.5	13.4	13.3	13.7	11.3	24.2
[2L, 4L)-in	15.6	15.5	15.6	15.6	15.6	15.6	15.8	17.8	29.8
[2L, 4L)-out	28.6	28.3	28.6	28.6	29.9	28.6	28.6	19.3	28.5
[4L, 8L)	13.2	13.2	13.2	13.2	13.2	13.2	13.4	19.6	30.6
[8L, 16L)	23.7	23.6	23.7	23.7	23.6	23.7	23.7	19.6	23.7
Maximum Slope – Reference Mast									
Distance	Median	3542	3755	3856	5417	5492	8069	8376	8610
	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]	[%]
< 2L	11.4	11.4	11.4	11.4	11.2	11.4	11.5	13.8	20.2
[2L, 4L)-in	16.1	16.0	16.1	16.1	16.1	16.0	15.7	23.0	22.4
[2L, 4L)-out	20.9	20.8	20.9	20.9	21.0	20.9	20.8	14.2	20.8
[4L, 8L)	13.0	13.0	13.0	13.0	12.9	13.0	13.1	22.9	26.1
[8L, 16L)	22.9	22.8	22.9	22.9	23.0	22.9	23.1	15.1	23.0
Max Terrain Variation from plane – Test Turbine									
Distance	Median	3542	3755	3856	5417	5492	8069	8376	8610
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	62.5	61.8	62.1	62.5	185.8	63.4	61.6	45.0	20.8
[2L, 4L)-in	181.8	188.6	181.2	181.8	189.7	191.1	190.2	164.6	42.2
[4L, 8L)	444.6	440.8	444.6	445.2	443.0	444.5	442.0	279.9	95.7
Max Terrain Variation from plane – Reference Mast									
Distance	Median	3542	3755	3856	5417	5492	8069	8376	8610
	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]
< 2L	47.8	47.2	48.1	47.8	182.6	48.1	47.6	64.0	18.9
[2L, 4L)-in	130.0	127.8	130.5	130.0	130.2	130.2	136.9	139.9	56.9
[4L, 8L)	358.8	357.3	359.4	358.8	399.6	358.4	384.7	363.9	127.5

PARTICIPANTS TYPE B GROUP RESULTS for Task TA1 - Terrain Assessment Z-Scores – Limit value 2								
Maximum Slope – Test Turbine								
Distance	3542	3755	3856	5417	5492	8069	8376	8610
< 2L	0.11	0.00	0.00	0.05	0.11	0.11	1.18	5.74
[2L, 4L)-in	0.05	0.00	0.00	0.00	0.00	0.09	1.04	6.75
[2L, 4L)-out	1.12	0.00	0.00	4.86	0.00	0.00	34.74	0.52
[4L, 8L)	0.01	0.00	0.00	0.00	0.00	0.08	2.49	6.75
[8L, 16L)	1.05	0.00	0.00	1.05	0.00	0.00	43.17	0.17
Maximum Slope – Reference Mast								
Distance	3542	3755	3856	5417	5492	8069	8376	8610
< 2L	0.00	0.00	0.00	0.14	0.00	0.07	1.68	6.17
[2L, 4L)-in	0.09	0.00	0.00	0.00	0.09	0.35	6.02	5.49
[2L, 4L)-out	0.75	0.00	0.00	0.75	0.00	0.75	50.25	0.69
[4L, 8L)	0.00	0.00	0.00	0.05	0.00	0.05	5.22	6.89
[8L, 16L)	1.00	0.00	0.00	1.00	0.00	2.00	78.01	0.98
Max Terrain Variation from plane – Test Turbine								
Distance	3542	3755	3856	5417	5492	8069	8376	8610
< 2L	0.10	0.06	0.00	17.26	0.13	0.13	2.45	5.84
[2L, 4L)-in	0.44	0.04	0.00	0.51	0.60	0.54	1.11	9.00
[4L, 8L)	0.07	0.00	0.01	0.03	0.00	0.05	2.88	6.10
Max Terrain Variation from plane – Reference Mast								
Distance	3542	3755	3856	5417	5492	8069	8376	8610
< 2L	0.13	0.07	0.00	29.41	0.07	0.04	3.53	6.31
[2L, 4L)-in	0.22	0.05	0.00	0.02	0.02	0.69	0.99	7.34
[4L, 8L)	0.04	0.02	0.00	1.20	0.01	0.76	0.15	6.78
Task Result per Participant								
	3542	3755	3856	5417	5492	8069	8376	8610
	GREEN	GREEN	GREEN	YELLOW	GREEN	GREEN	YELLOW	YELLOW

PARTICIPANTS TYPE B, DECISION FOR TASK TA1: Terrain Assessment		
3542	PASS	Acceptable z-score for all results
3755	PASS	Acceptable z-score for all results
3856	PASS	Acceptable z-score for all results
5417	YELLOW	Z-limit exceeded for 3/16 results
5492	PASS	Acceptable z-score for all results
8069	PASS	Acceptable z-score for all results
8376	YELLOW	Z-limit exceeded for 10/16 results
8610	YELLOW	Z-limit exceeded for 12/16 results

The table below provides the statistics for the 5 successful participants from Group B:

PARTICIPANTS TYPE B GROUP STATISTICS for Task TA1 – Terrain Assessment ONLY SUCCESSFUL PARTICIPANTS (5/8)					
Maximum Slope – Test Turbine					
Distance	Sector	Median	Min	Max	Std. Dev.
		[%]	[%]	[%]	[%]
< 2L	360º	13.5	13.3	13.7	0.1
[2L, 4L)	Meas. Sector	15.6	15.5	15.8	0.1
[2L, 4L)	Outside Meas. Sector	28.6	28.3	28.6	0.1
[4L, 8L)	Meas. Sector	13.2	13.2	13.4	0.1
[8L, 16L)	Meas. Sector	23.7	23.6	23.7	0.0
Maximum Slope – Reference Mast					
Distance	Sector	Median	Min	Max	Std. Dev.
		[%]	[%]	[%]	[%]
< 2L	360º	11.4	11.4	11.5	0.0
[2L, 4L)	Meas. Sector	16.0	15.7	16.1	0.1
[2L, 4L)	Outside Meas. Sector	20.9	20.8	20.9	0.0
[4L, 8L)	Meas. Sector	13.0	13.0	13.1	0.0
[8L, 16L)	Meas. Sector	22.9	22.8	23.1	0.1
Max Terrain Variation from plane – Test Turbine					
Distance	Sector	Median	Min	Max	Std. Dev.
		[m]	[m]	[m]	[m]
< 2L	360º	62.1	61.6	63.4	0.6
[2L, 4L)	Meas. Sector	188.6	181.2	191.1	4.2
[4L, 8L)	Meas. Sector	444.5	440.8	445.2	1.7
Max Terrain Variation from plane – Ref Mast					
Distance	Sector	Median	Min	Max	Std. Dev.
		[m]	[m]	[m]	[m]
< 2L	360º	47.8	47.2	48.1	0.3
[2L, 4L)	Meas. Sector	130.2	127.8	136.9	3.1
[4L, 8L)	Meas. Sector	358.8	357.3	384.7	10.5

6.11. Obstacles – Task OBS1

All the participants provided results for task OBS1. The assessed results are the boundaries of the measurement sub-sectors. All the participants identified two sub-sectors in the final measurement sector. Therefore, the number of the assessed results are 4.

The median value is based on the results of all type A participants. No outliers found. The median results of type A and type B participants are within 0.1 deg.

The results of type A participants were within 0.1 deg of the median.

PARTICIPANTS GROUP STATISTICS for Task OBS1 – Calculation of measurement sector boundaries												
TYPE A						TYPE B					
Median		Min		Max		Median		Min		Max	
From (°)	To (°)	From (°)	To (°)	From (°)	To (°)	From (°)	To (°)	From (°)	To (°)	From (°)	To (°)
16.8	148.5	16.8	148.4	16.9	148.6	16.9	148.5	12.5	148.5	16.9	166.2
264.6	285.2	264.6	285.1	264.7	285.3	264.7	285.2	228.6	277.2	264.7	287.5

PARTICIPANTS TYPE A RESULTS for Task OBS1 – Calculation of measurement sector boundaries					
ID	From (°)	To (°)	From (°)	To (°)	TASK RESULT
0536	16.9	148.5	264.7	285.2	GREEN
2546	16.9	148.5	264.7	285.2	GREEN
3652	16.8	148.5	264.6	285.2	GREEN
3844	16.8	148.6	264.6	285.3	GREEN
4394	16.8	148.6	264.6	285.3	GREEN
4680	16.9	148.5	264.7	285.2	GREEN
4709	16.9	148.4	264.7	285.1	GREEN
5143	16.8	148.5	264.6	285.2	GREEN
5481	16.8	148.5	264.6	285.2	GREEN
5503	16.9	148.6	264.7	285.2	GREEN
6300	16.8	148.6	264.6	285.3	GREEN
6857	16.9	148.5	264.6	285.2	GREEN
6974	16.8	148.5	264.6	285.2	GREEN
8418	16.9	148.5	264.7	285.2	GREEN
8547	16.8	148.5	264.6	285.2	GREEN
9254	16.8	148.6	264.6	285.3	GREEN
9297	16.9	148.5	264.7	285.2	GREEN
9398	16.8	148.5	264.6	285.2	GREEN
9648	16.9	148.5	264.7	285.2	GREEN
9962	16.9	148.5	264.7	285.2	GREEN
9974	16.8	148.5	264.6	285.2	GREEN

PARTICIPANTS TYPE A, DECISION FOR TASK OBS1 – Calculation of measurement sector boundaries		
0536	PASS	Within-limits deviation from median for all boundaries of the measurement sector
2546	PASS	Within-limits deviation from median for all boundaries of the measurement sector
3652	PASS	Within-limits deviation from median for all boundaries of the measurement sector
3844	PASS	Within-limits deviation from median for all boundaries of the measurement sector
4394	PASS	Within-limits deviation from median for all boundaries of the measurement sector
4680	PASS	Within-limits deviation from median for all boundaries of the measurement sector
4709	PASS	Within-limits deviation from median for all boundaries of the measurement sector
5143	PASS	Within-limits deviation from median for all boundaries of the measurement sector
5481	PASS	Within-limits deviation from median for all boundaries of the measurement sector
5503	PASS	Within-limits deviation from median for all boundaries of the measurement sector
6300	PASS	Within-limits deviation from median for all boundaries of the measurement sector
6857	PASS	Within-limits deviation from median for all boundaries of the measurement sector
6974	PASS	Within-limits deviation from median for all boundaries of the measurement sector
8418	PASS	Within-limits deviation from median for all boundaries of the measurement sector
8547	PASS	Within-limits deviation from median for all boundaries of the measurement sector
9254	PASS	Within-limits deviation from median for all boundaries of the measurement sector
9297	PASS	Within-limits deviation from median for all boundaries of the measurement sector
9398	PASS	Within-limits deviation from median for all boundaries of the measurement sector
9648	PASS	Within-limits deviation from median for all boundaries of the measurement sector
9962	PASS	Within-limits deviation from median for all boundaries of the measurement sector
9974	PASS	Within-limits deviation from median for all boundaries of the measurement sector

The following tables relate to type B participants. The deviations exceeding the threshold are indicated in orange.

PARTICIPANTS TYPE B RESULTS for Task OBS1 – Calculation of measurement sector boundaries					
ID	From (°)	To (°)	From (°)	To (°)	TASK RESULT
3542	16.9	148.5	264.7	285.2	GREEN
3755	16.9	148.5	264.6	285.2	GREEN
3856	16.8	148.5	264.7	285.2	GREEN
5417	16.9	148.5	264.7	285.2	GREEN
5492	16.8	148.6	264.6	285.3	GREEN
8069	16.9	148.5	264.7	277.2	RED
8376	12.5	166.2	228.7	287.5	RED
8610	12.6	154.3	228.6	287.4	RED

PARTICIPANTS TYPE B, DECISION FOR TASK OBS1 – Calculation of measurement sector boundaries		
3542	PASS	Within-limits deviation from median for all boundaries of the measurement sector
3755	PASS	Within-limits deviation from median for all boundaries of the measurement sector
3856	PASS	Within-limits deviation from median for all boundaries of the measurement sector
5417	PASS	Within-limits deviation from median for all boundaries of the measurement sector
5492	PASS	Within-limits deviation from median for all boundaries of the measurement sector
8069	FAIL	Out-of-limits deviation from median for 1/4 of the boundaries of the measurement sector (deviating treatment of obstacles).
8376	FAIL	Out-of-limits deviation from median for 4/4 of the boundaries of the measurement sector (deviating treatment of operating & parked turbines and obstacles).
8610	FAIL	Out-of-limits deviation from median for 4/4 of the boundaries of the measurement sector (deviating treatment of operating & parked turbines and obstacles).

The table below provides the statistics for the 5 successful participants from Group B:

PARTICIPANTS GROUP B STATISTICS for Task OBS1 – Calculation of measurement sector boundaries ONLY SUCCESSFUL PARTICIPANTS (5/8)					
Median		Min		Max	
From (°)	To (°)	From (°)	To (°)	From (°)	To (°)
16.9	148.5	16.8	148.5	16.9	148.6
264.7	285.2	264.6	285.2	264.7	285.3

6.12. Proficiency Test Outcome

The evaluation of the participants for each of the 11 assessed tasks has been presented in sections 6.1 to 6.11.

The results are combined according to the decision rules of section 3.2 to calculate the performance of each participant in the Proficiency Test.

	PARTICIPANTS TYPE A – PROFICIENCY TEST PERFORMANCE												
	SC1	SC2	PC1	PC2	AEP1	AEP2	AEP3	DF1	IS1	OBS1	TA1	PT	SCORE
0536	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN	FAIL	10/11
2546	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	PASS	10/11
3652	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
3844	RED	GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	FAIL	9/11
4394	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
4680	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	PASS	10/11
4709	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
5143	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
5481	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
5503	GREEN	RED	GREEN	RED	GREEN	GREEN	GREEN	GREEN	RED	GREEN	GREEN	FAIL	8/11
6300	GREEN	GREEN	RED	GREEN	GREEN	GREEN	GREEN	GREEN	RED	GREEN	GREEN	FAIL	9/11
6857	RED	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	FAIL	10/11
6974	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
8418	GREEN	GREEN	RED	YELLOW	GREEN	GREEN	GREEN	GREEN	RED	GREEN	GREEN	FAIL	8/11
8547	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
9254	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
9297	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
9398	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
9648	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
9962	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	PASS	10/11
9974	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11

PARTICIPANTS TYPE A – PROFICIENCY TEST GROUP SUCCESS RATE PER TASK											
SC1	SC2	PC1	PC2	AEP1	AEP2	AEP3	DF1	IS1	OBS1	TA1	SCORE
19/21	20/21	19/21	18/21	21/21	21/21	20/21	21/21	18/21	21/21	18/21	216/231
90%	95%	90%	86%	100%	100%	95%	100%	86%	100%	86%	93.5%

Based on a total number of 21 participants x 11 tasks/participant = 231 tasks, the Group A success rate was 93.5%.

	PARTICIPANTS TYPE B – PROFICIENCY TEST PERFORMANCE												
	SC1	SC2	PC1	PC2	AEP1	AEP2	AEP3	DF1	IS1	OBS1	TA1	PT	SCORE
3542	RED	GREEN	GREEN	RED	RED	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	FAIL	8/11
3755	GREEN	GREEN	GREEN	RED	RED	GREEN	RED	GREEN	GREEN	GREEN	GREEN	FAIL	8/11
3856	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
5417	RED	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	YELLOW	FAIL	9/11
5492	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	GREEN	PASS	11/11
8069	GREEN	GREEN	RED	RED	GREEN	GREEN	GREEN	GREEN	GREEN	RED	GREEN	FAIL	8/11
8376	RED	RED	RED	RED	GREEN	GREEN	RED	GREEN	RED	RED	YELLOW	FAIL	3/11
8610	GREEN		GREEN	GREEN	RED	GREEN	GREEN	GREEN	YELLOW	RED	YELLOW	FAIL	6/11

PARTICIPANTS TYPE B – PROFICIENCY TEST GROUP SUCCESS RATE PER TASK											
SC1	SC2	PC1	PC2	AEP1	AEP2	AEP3	DF1	IS1	OBS1	TA1	SCORE
5/8	6/8	6/8	4/8	5/8	8/8	6/8	8/8	6/8	5/8	5/8	64/88
63%	75%	75%	50%	63%	100%	75%	100%	75%	63%	63%	72.7%

Based on a total number of 8 participants x 11 tasks/participant = 88 tasks, the Group B success rate was 72.7%.

Those participants that are related to the IECRE system (RETLs and applicant RETLs) and have failed the Proficiency Test are entitled to present a correction plan to the IECRE-Wind RETL Lead Assessor.

The laboratories that have presented a successful correction plan before the elaboration of this report are listed below as successful participants.

7. IECRE Participants that have passed the Proficiency Test

The following participants (in alphabetical order) are either IECRE RETLs or RETL candidates and have passed the Proficiency Test:

Testing Laboratory
ArcVera Renewables
Aresse Engineering S.L.
Barlovento Recursos Naturales S.L.
Beijing CGC Certification Center Co., Ltd.
China Classification Society Certification Company Ltd. (CCSC)
China Electric Power Research Institute - CEPRI
COWI A/S
Deutsche WindGuard Consulting GmbH
DNV Energy Systems Germany GmbH
DNV Energy USA, Inc.
DTU Wind and Energy Systems, Technical University of Denmark. “Wind Turbine Test”, Test and Calibration (TAC)
Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.
GL Garrad Hassan Iberica (DNV)
Shangai SERCAL New Energy Technology Co. Ltd.
TNO Energy Transition
UL International GmbH
Wind-consult Ingenieurgesellschaft für umweltschonende Energiewandlung mbH
Windtest Grevenbroich GmbH
Wood Group UK Ltd.

Note: This list only contains the IECRE members that have passed the Proficiency Test. Additional participants have passed the Proficiency Test, but are not related to the IECRE system and therefore not listed here.

The list reflects both the laboratories that have passed the second round of the Proficiency Test and those that have successfully completed the Correction Plan Phase. In order to improve the result analysis, the tables in section 6 show the results of Round 2 **before** the correction plan phase. Thus, the number of successful participants does not match between the sections 6 & 7.

8. References

[1] IEC 61400-21-1:2017, Power Performance measurements of electricity producing wind turbines.

[2] IECRE OD-551-17, Edition 1.0, IECRE, 2020-08-17.