Agenda
• The 1st meeting gave a clear statement of the **problem**.

• The 2nd meeting examined possible **solutions**.

• The 3rd meeting put some of those solutions into **practice**.

• The 4th meeting **consolidated** the learning by examining new datasets.

• The 5th meeting will focus on **validating** the candidate correction methods against real data.

There will be an in depth retrospective of the progress to date in the afternoon.
# Power Curve Working Group Roadmap

<table>
<thead>
<tr>
<th>Definition</th>
<th>Solution / Evolution</th>
<th>Conclusion</th>
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<tbody>
<tr>
<td>Meeting 1</td>
<td>Meeting 2</td>
<td>Round Robin 1</td>
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<tr>
<td>Define what’s the problem we are trying to solve.</td>
<td>Identify possible solutions</td>
<td>Trial solutions</td>
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**Current Status**

- Publically disseminate presentations and minutes

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Review of Actions from Last Meeting

- Final collation of Round Robin 2 Results (see minutes)
- Rotor Equivalent Wind Speed Consensus Analysis (Final)
- Turbulence Renormalisation Consensus Analysis (Draft)
- 1st Validation dataset published (based on dataset 1 from Round Robin)
- Draft Inner-Outer Range Proposal (circulated within group)
10.00 – 10.05 “Welcome” Daniel Stevens (SSE)

Analysis of Validation Dataset 1

- 10.05 – 10.15 “Validation Framework and Dataset 1 Overview” Peter Stuart (RES)
- 10.15 – 10.30 “Dataset 1 Colour Map Analysis” Tomas Blodau (REPower)
- 10.30 – 10.45 “Rotor Equivalent Wind Speed: One Power Curve or Two?” Axel Albers (WindGuard)

Additional Validation Analysis

- 10.45 – 11.00 “GL DNV Validation Analysis” Richard Whiting (DNV GL)
- 11.00 – 11.15 “RES Validation Analysis” Alex Clerc (RES)
- 11.15 – 11.30 “EDF Validation Analysis” Jared Kassebaum (EDF)
Additional Open Datasets (11.30 – 12.00)

- Proposed SSE/Sgurr Dataset Dan Stevens (SEE) & Ralph Torr (Sgurr)
- Proposed RES Dataset
- Discussion: potential for other datasets?

12.00 – 12.15 “Rotor Equivalent Wind Speed and Turbulence Renormalisation Implementation in OpenWind“ Nick Robinson (AWS TruePower)

12.15 – 13.00 Morning Discussion Session (Moderated by Peter Stuart)

- Rotor Equivalent Wind Speed Consensus Analysis
- Addition of Veer to REWS Consensus Analysis
- Turbulence Renormalisation Consensus Analysis
- Possible public distribution of Consensus Analysis.
- Inner / Outer Range Statement Document Discussion

13.00 – 14.00 Lunch
Afternoon Agenda (Moderated by Andrew Tindal GLGH)

Afternoon Discussion Session Part 1: 14:00 – 15:30

- 14:00 – 14:15 “One year on, A review of Working Group progress to date” (Andrew Tindal DNV GL)
- Open Discussion
  - Discussion of issues raised in presentations
  - Round robin of views of Manufacturers present – verbal or brief slides

15.30 – 15.45 Tea/Coffee Break

Afternoon Discussion Part 2: 15.45 – 17.30

Next steps for working group
- Wrap Up, Conclusions (20 minutes)
- Continued Public Distribution of Minutes and Presentations (5 minutes)
- Venue for next meeting (5 minutes)
Validation Framework Overview
Validation Analysis Overview

PCWG Validation Framework

Raw Data Set

- Ideal Dataset:
  - 2 Power Performance Met Masts
  - Vertical Profile LiDAR
  - Actual Power Data

Standardised Filtering

Note: validation datasets without LiDAR data are still potentially useful.

Filtered Data Set

Concurrent; Mast data, LiDAR data and Power Data

Consensus Site calibration

Baseline Data Set

Baseline Inner Range Power Curve

Consensus Analysis

Power curve against which corrections for non-standard conditions will be evaluated.

Validation Dataset

Concurrent; Actual Power, Baseline Power & Corrected Power

Consensus Validation

Validate:
- Rotor Equivalent Wind Speed
- Turbulence Renormalisation
- Proxy Methods
Validation Dataset Flavours

Warranted Power Curve Based – Consistent with Round Robin (Original)

Inner Range Power Curve Based – Consistent with validation framework (just released)
Dataset 1 Colour-map Analysis (Relative to Warranted)
Prepared by REPower
Wind speed vs. TI (All Data)
Shear vs. TI (All Data)
Power Curve for All Shear
Wind Speed vs. TI (Shear < 0.2)
Wind Speed vs. TI (0.2 < Shear < 0.3)
Wind Speed vs. TI for Shear > 0.3
Shear vs. TI for Wind Speed < 6
Shear vs. TI for 6 < Wind Speed < 10
Shear vs. TI for Wind Speed > 10