

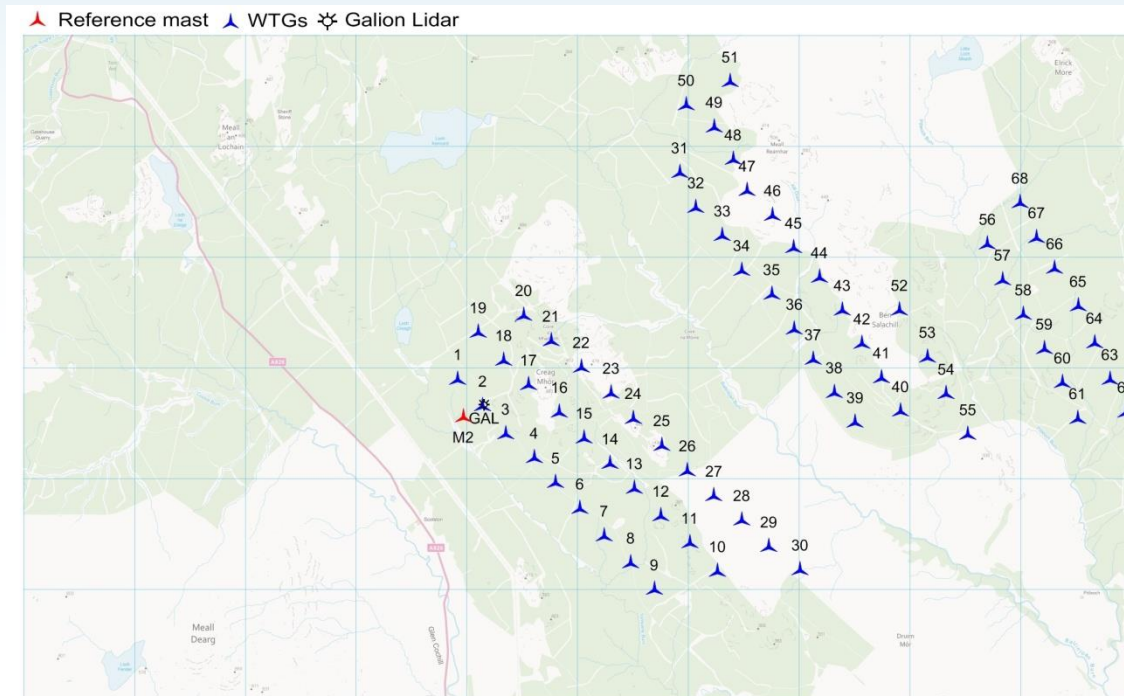


Power Curve Working Group #5: Potential validation dataset

Daniel Stevens (SSE Renewables)
04 December 2013

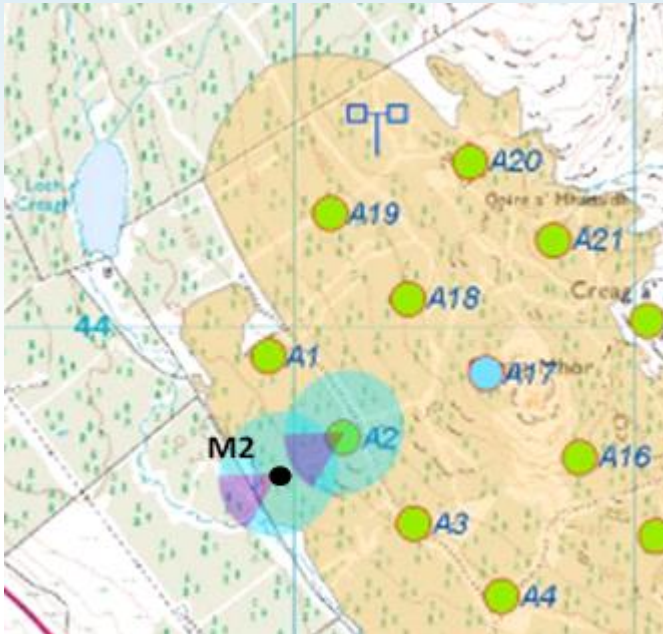
Griffin Wind Farm – power curve test

- Complex site with extensive forestry
- SgurrEnergy appointed as test consultant
- Site calibration complete, PPT ongoing
- Galion LiDAR installed in June 2013 at test turbine



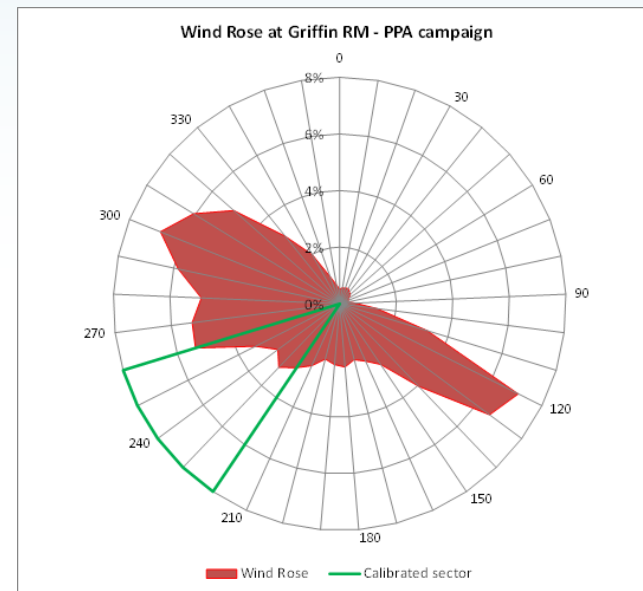
Griffin Wind Farm – power curve test (2)

- 1 WTG (A2) chosen for PPT
- Siemens 101-2.3MW turbine



Turbine A2 → Ref mast: 200m;
Ref mast → forestry edge: 120m;
Trees: ~10m in height

Free stream sector*: 173 - 284°
Calibrated sector: **220 - 260°**



*For mast
and WTG

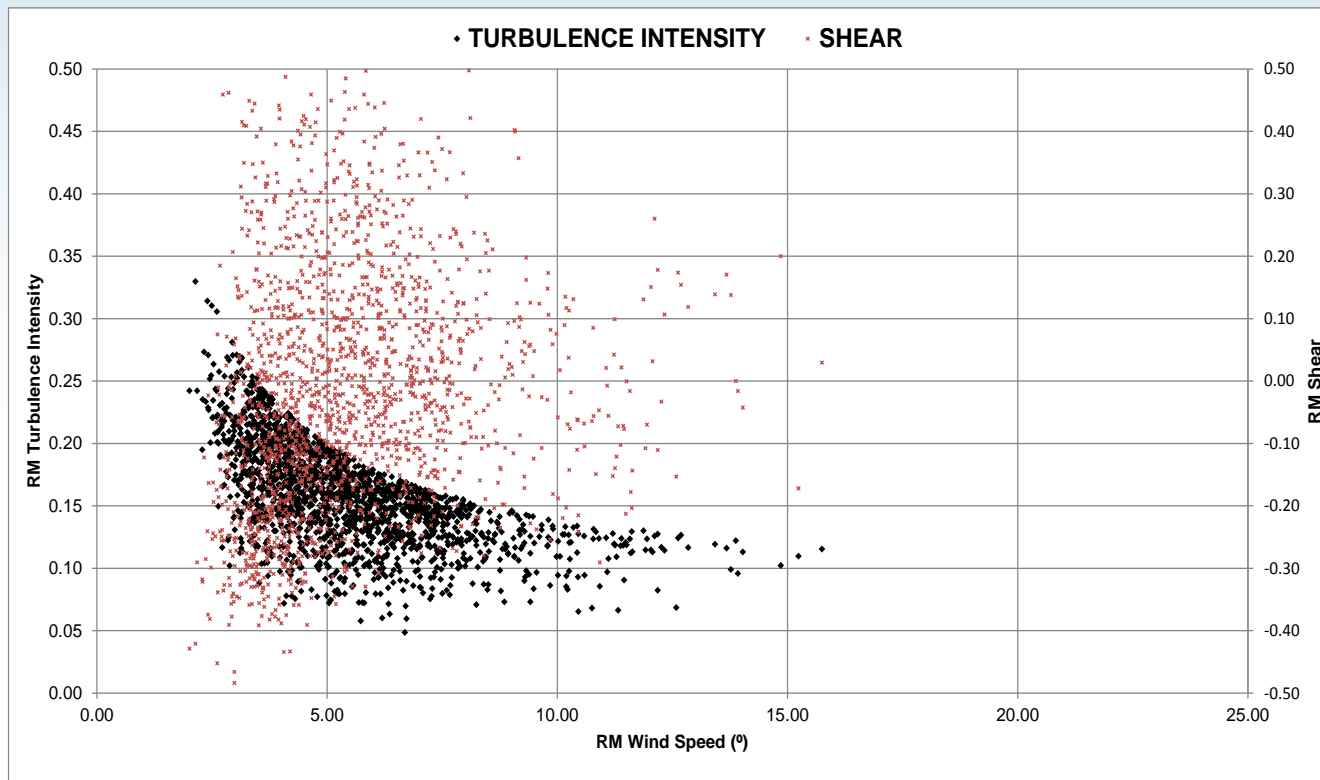
Griffin Wind Farm – power curve test (3)

View from mast:



Griffin Wind Farm – power curve test (4)

- Expect to complete PPT by end of Q1 2014
- Plot shows TI and Shear at Reference Mast **after filtering**



FILTERS APPLIED: Wind speed >3 m/s; Flow inclination: -3° to + 3°; TI: $0.05 < TI < 0.1 \cdot (0.8 \cdot V_{hub} + 6 \text{ m/s}) / V_{hub}$

Galion deployment

- Deployed @ A2 in June 2013 as a collaborative trial (Sgurr/SSE)
- Phase 1 complete
 - Focussed on calibrated sectors only
 - Collected MWS @ Mast @ HH, plus Shear and TI between Mast and WTG
- Phase 2 ongoing
- Phase 3 to be defined

AIMS of study

1. Validate Galion using data from reference met mast
2. Explore and optimise scan geometries
3. Provide REWS data of use to PCWG
4. Explore potential for Lidar-based PPTs in complex terrain
5. Apply Annex L of IEC 61400-12-1 CDV in method and reporting

Discussion

- Are the data of use to PCWG as a REWS validation dataset?
- Is the site too complex?
- What other scan geometries would be of use?
- Are data from outside the calibrated sector of interest?
- Can we change scan geometries to make those data more useful?
- What timescales should we work towards for providing data?