Notes from Meeting II

Exercise 3

Tomas Blodau
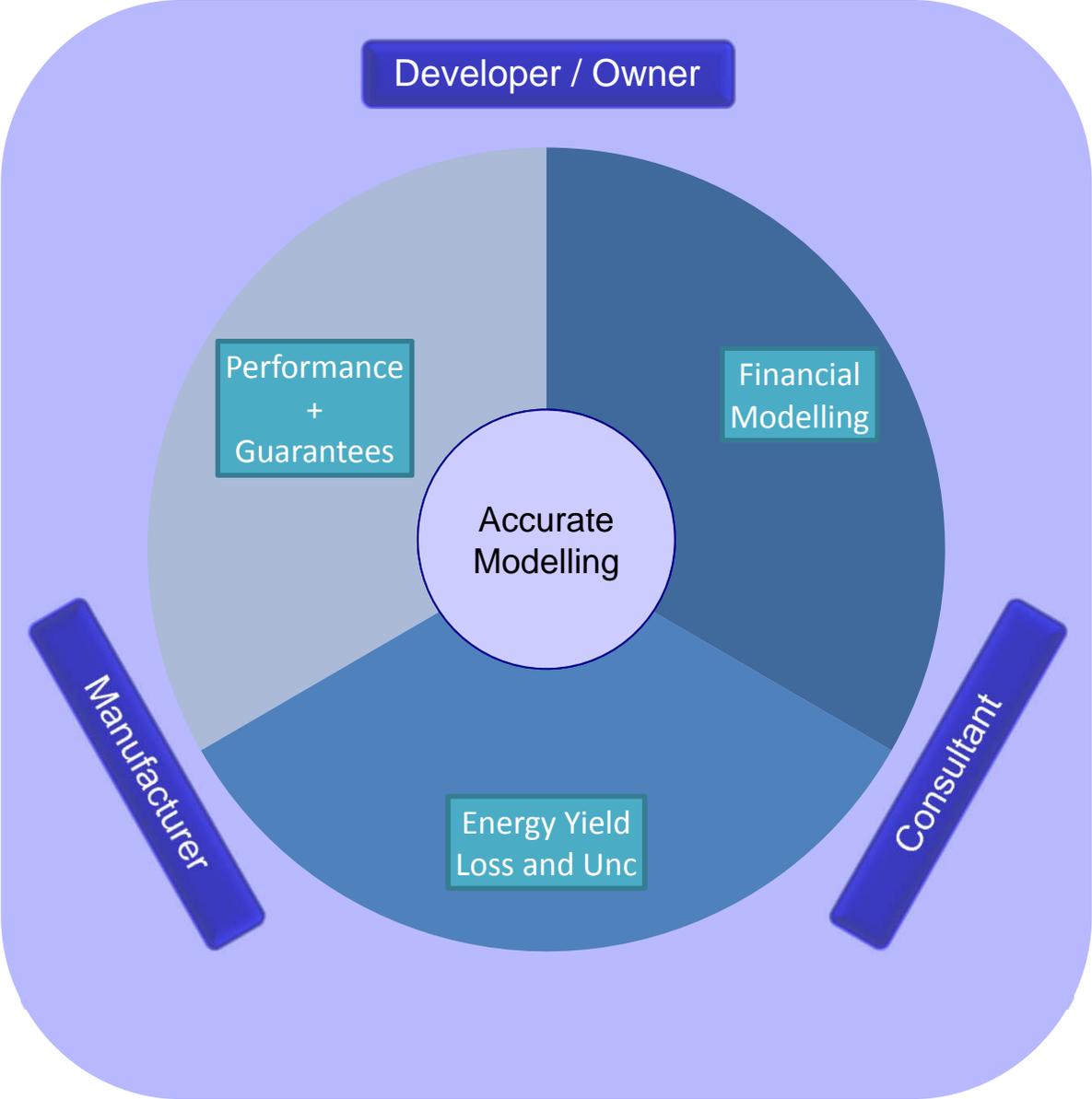
30.05.2013

Summary

- Cooperation between stakeholders

- Guarantee approach – inner and outer range – Exercise 3
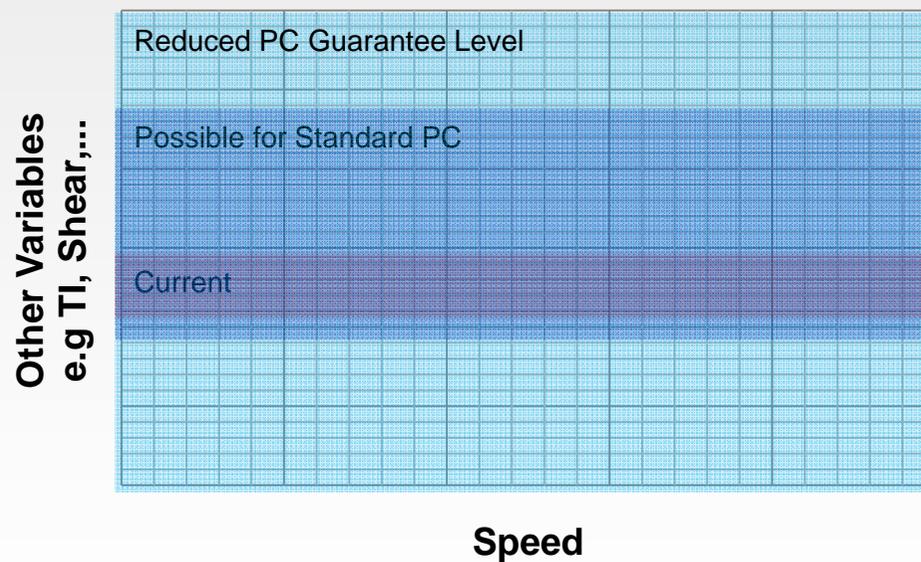
Poor Current Cooperation

Manufacturer

Purchasing ⬌ Sales

Energy Yield Calculation ➡ Financial Modelling

Performance Guarantees

Developer

Consultant

Improved Stakeholder Cooperation

Extended use of Standard Power Curves

- Current guarantee filters quite limiting

- Manufacturers provide full range of PC applicability

- Option of providing further PC for extending applicability range

Reduced PC Guarantee Level

Possible for Standard PC

Current

Other Variables e.g TI, Shear,... (y-axis)

Speed (x-axis)

- Time series analysis, use relevant guarantee level for each time step

Exercise 3

Using the dataset provided by RES for Exercise 1 and 2, Exercise 3 is to calculate AEPs based on „inner"
and „outer" ranges of data and related guarantee levels. The overall AEP is the sum of the AEP calculated
for the inner range and the AEP calculated for the outer range.

Inner Range:

Any 10 min data set that complies with the following filter criteria is in the inner range.

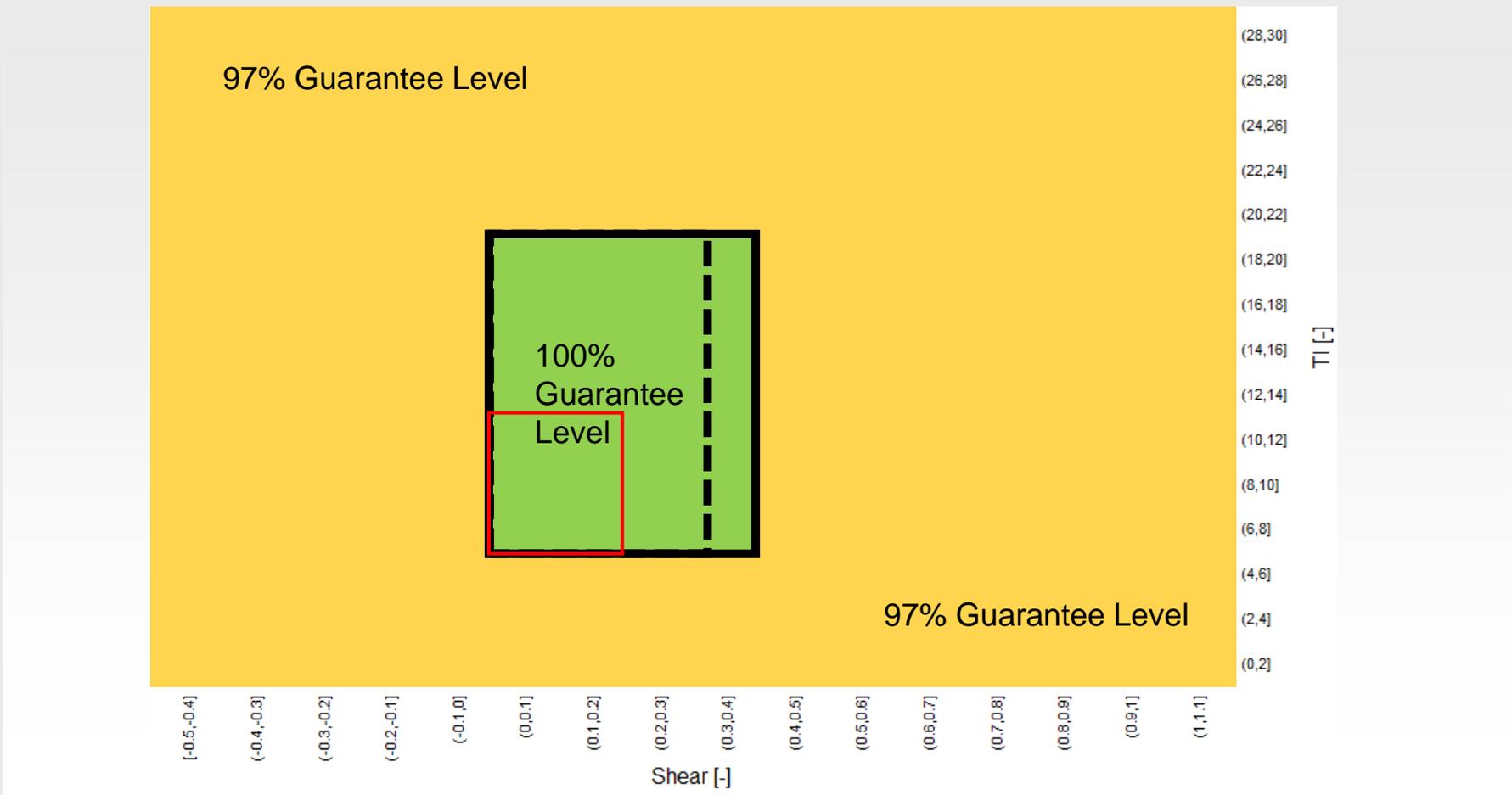|	**Shear Exponent** (Lower Blade Tip to HH)	**TI** (HH cup anemometer)
Hub Height wind speed	0 – 0.35	6 – 20%
Rotor Equivalent wind speed	0 – 0.4	6 – 20 %

Outer Range:

All data which is not within the inner range.

Overall AEP = (Inner Range AEP x 1) + (Outer Range AEP x 0.97)

The power curve is guaranteed to 100% for the inner range and to 97% for the outer range.

As for the other exercises please apply the power curve to the measured height i.e. 95 m. The power
curve to be used (MM92) is shown overleaf.

REpower WEC performance

AEP calculation proposal / Guarantee proposal

97% Guarantee Level

100% Guarantee Level

97% Guarantee Level

TI [-]: (0,2], (2,4], (4,6], (6,8], (8,10], (10,12], (12,14], (14,16], (16,18], (18,20], (20,22], (22,24], (24,26], (26,28], (28,30]

Shear [-]: [-0.5,-0.4], (-0.4,-0.3], (-0.3,-0.2], (-0.2,-0.1], (-0.1,0], (0,0.1], (0.1,0.2], (0.2,0.3], (0.3,0.4], (0.4,0.5], (0.5,0.6], (0.6,0.7], (0.7,0.8], (0.8,0.9], (0.9,1], (1,1.1]

Summary

- Cooperation between stakeholders

- Guarantee approach – inner and outer range – Exercise 3

Thank you

Yield Deviation – MM82 & MM92