A large white offshore wind turbine stands on a yellow steel jacket structure in the middle of the ocean. The sky is clear blue, and other smaller offshore structures are visible in the distance.

Measurements as a Basis for
Extended use of Standard Power
Curves

Tomas Blodau

12.03.2013

- Current power curves are seen as limited
- Change of approach from standard pc will be difficult to implement
- Propose simple improvements to current approach

- Wind Speed is primary dependency
- Other parameters play minor role
- Measurements show good PC performance for wide ranges
- Use site measurements as basis for guarantee



Extended use of Standard Power Curves

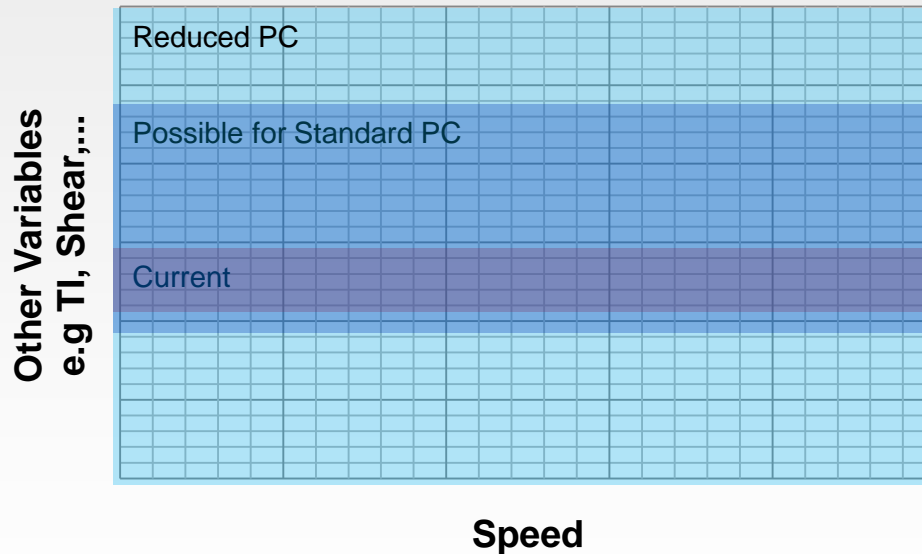


Measurements in Wakes?



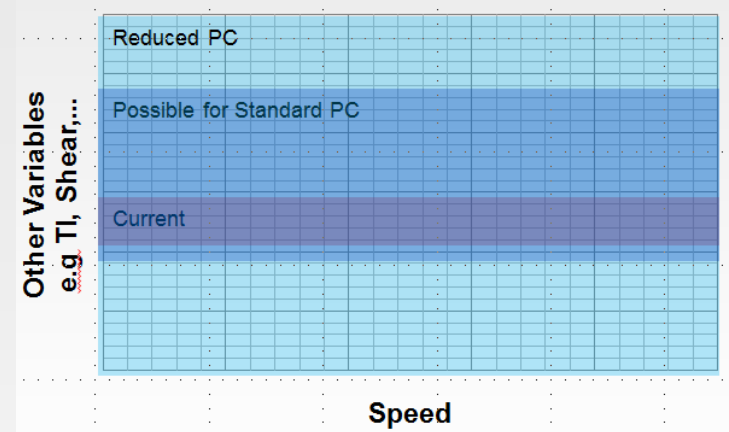
Summary

- Current filters quite limiting
- Manufacturers provide full range of PC applicability
- Option of providing further PC for extending applicability range

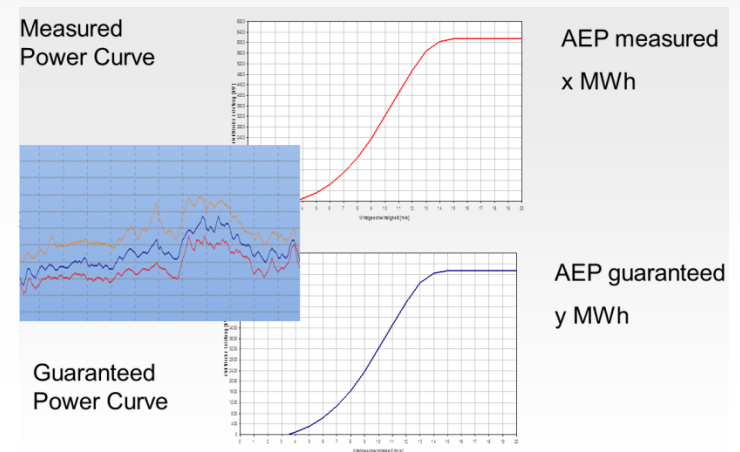


- Weibull approach: Divide energy calculation in proportions
- Time series, use relevant pc for each time step

- Early project phase
 1. Use full range of standard PC
 2. Reduced PC for other conditions

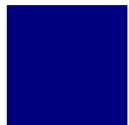


- For contract guarantee
 3. provide WEC/site specific AEP guarantee level based on site time series





Extended use of Standard Power Curves



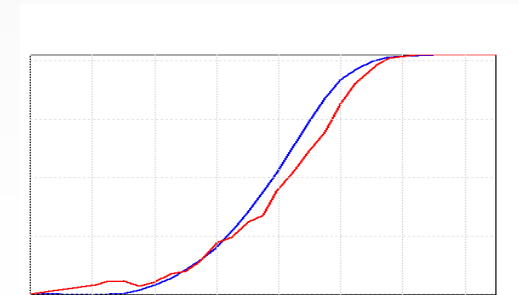
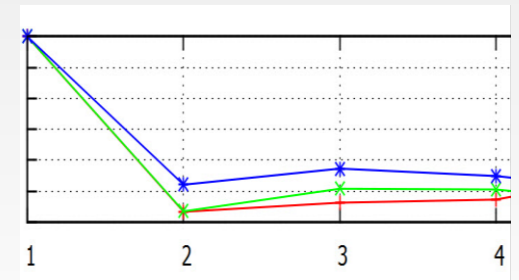
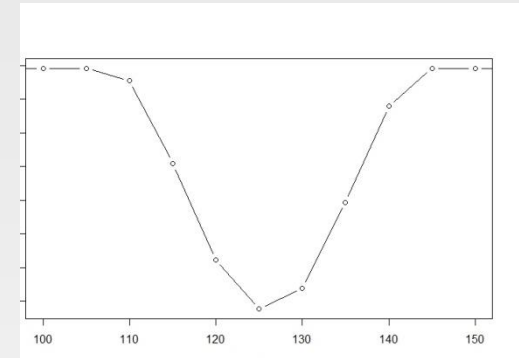
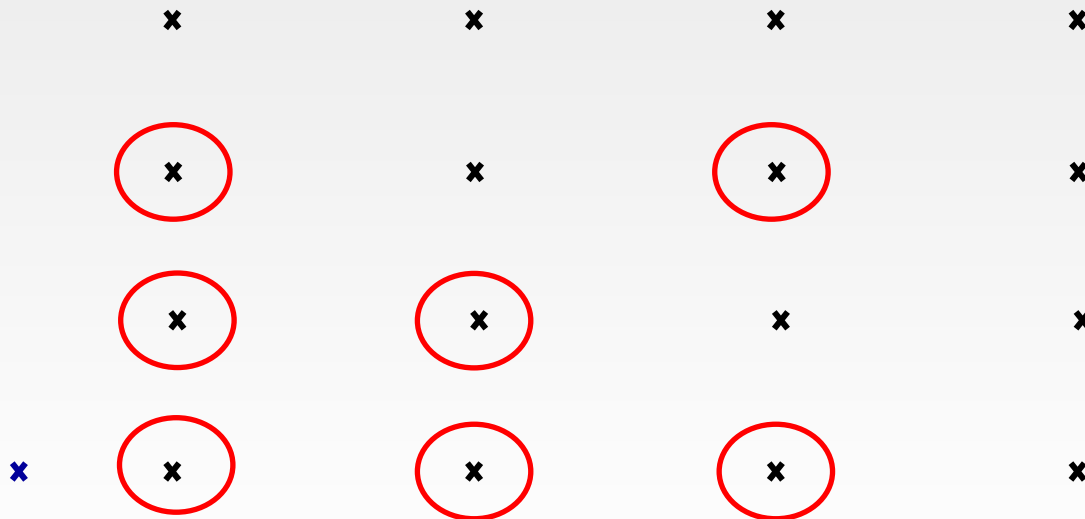
Measurements in Wakes?



Summary

For wake yield calculation:

1. Calculate wake reduced wind speed
2. And use free stream power curve



Idea: generate waked power curves for direct use

Single wake, double wake, etc



Extended use of Standard Power Curves



Measurements in Wakes?



Summary

- Wind Speed is primary dependency
- Other parameters play minor role
- Measurements show good performance for wide ranges – extend guarantee range
- Use site measurements as basis for guarantee





Thank you

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