



EWEA

Resource Assessment Workshop

Power Curves

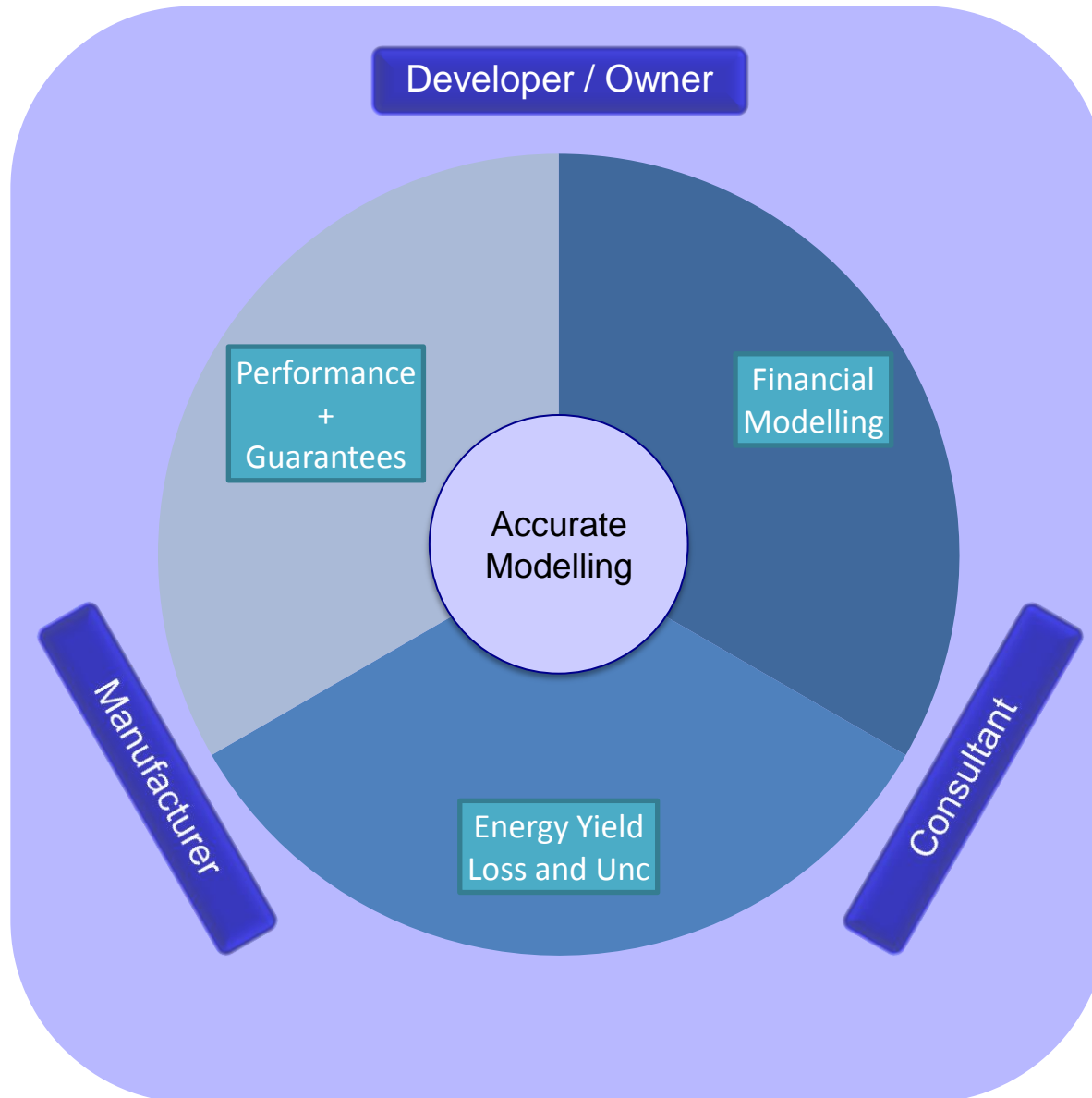
Marten Seifert

25.06.2013

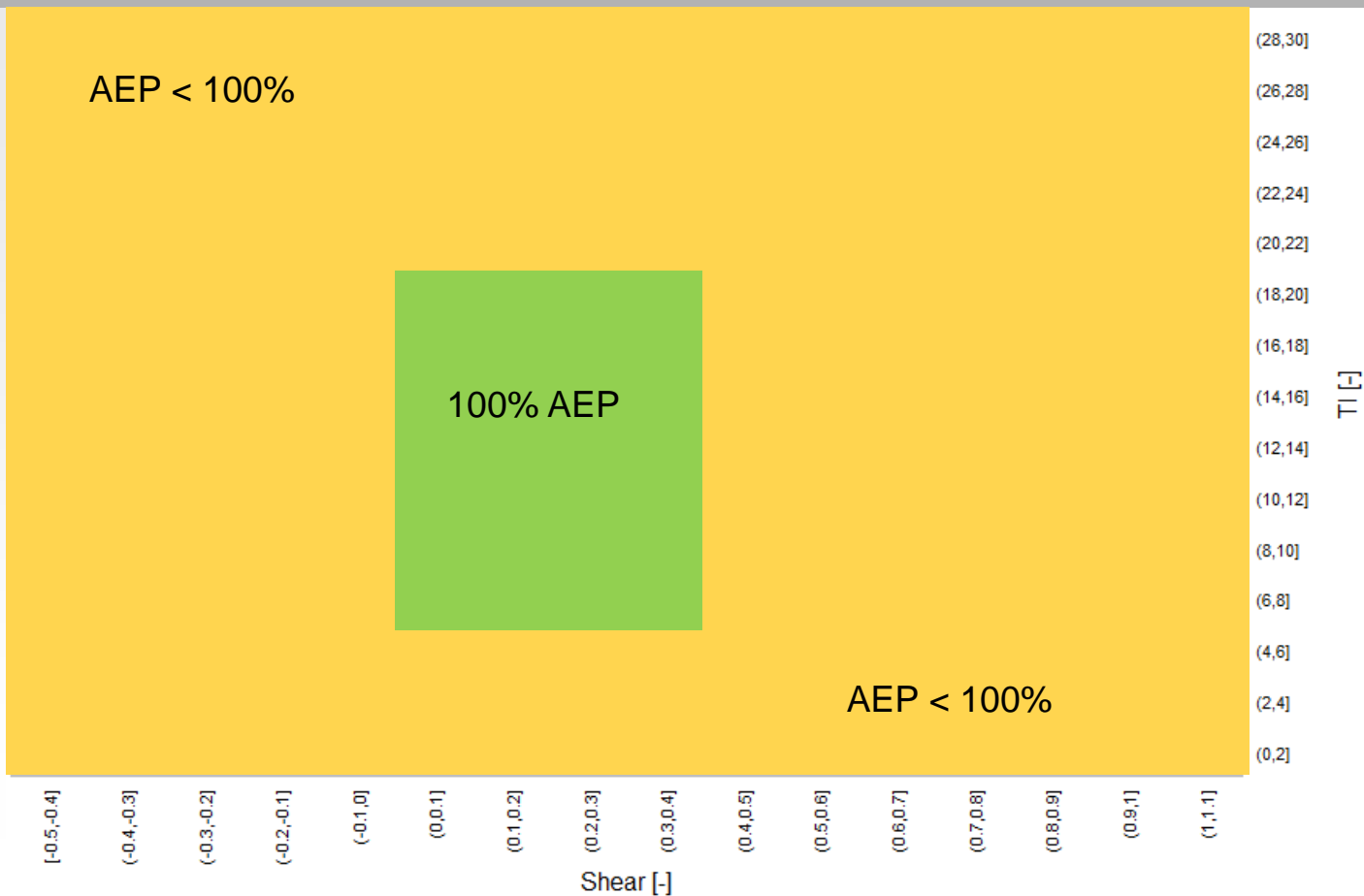


- Cooperation between stakeholders
- Guarantee approach – inner and outer range – proposal
- Results of detailed power curve analysis

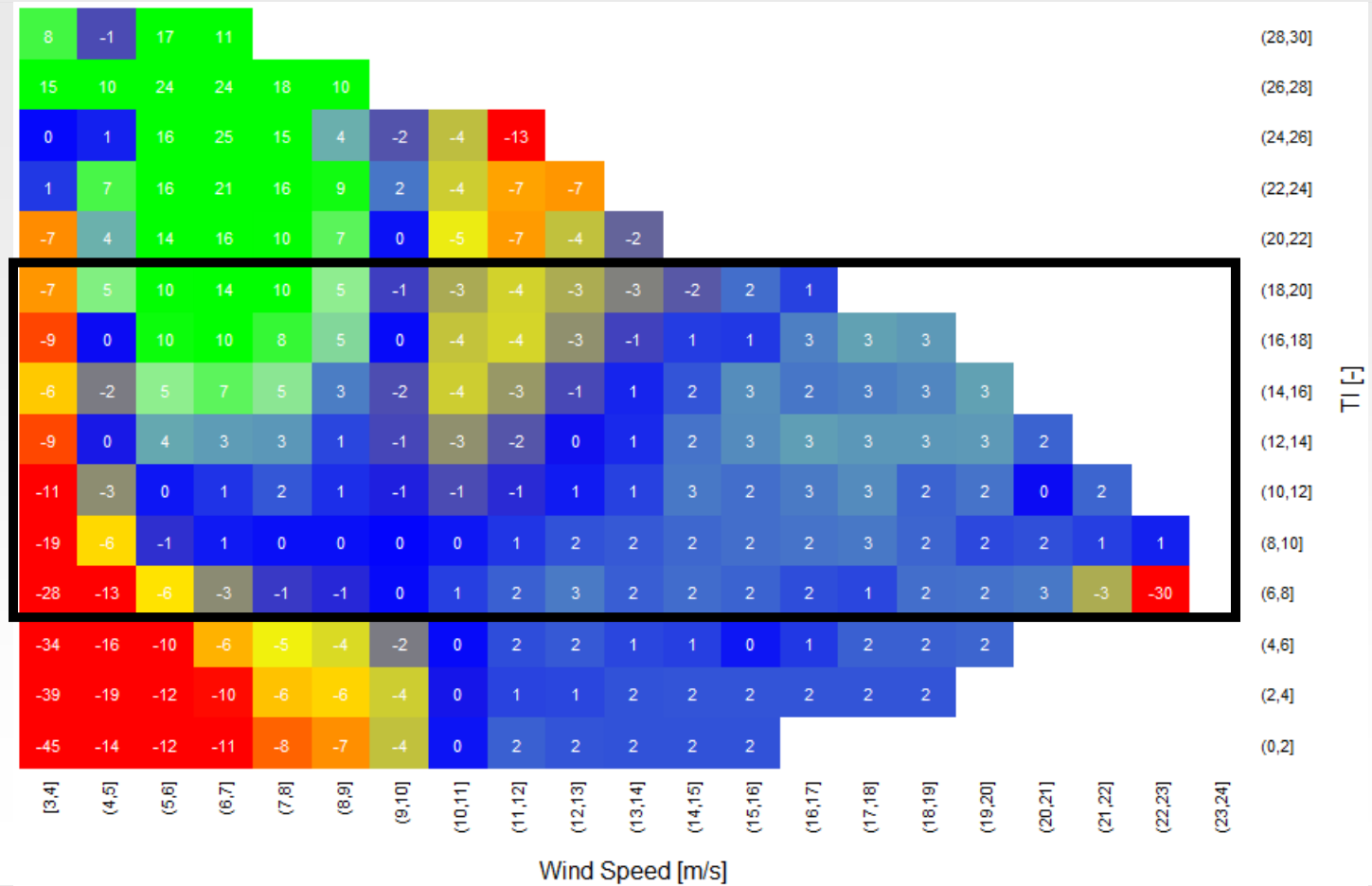
Improved Stakeholder Cooperation Required



AEP calculation proposal / Guarantee proposal



Power Curve Deviation – MM82 & MM92



PC Measurement Analysis

Power Curve Verification Reference List



MD70

MD7

MM70

MM82

MM92

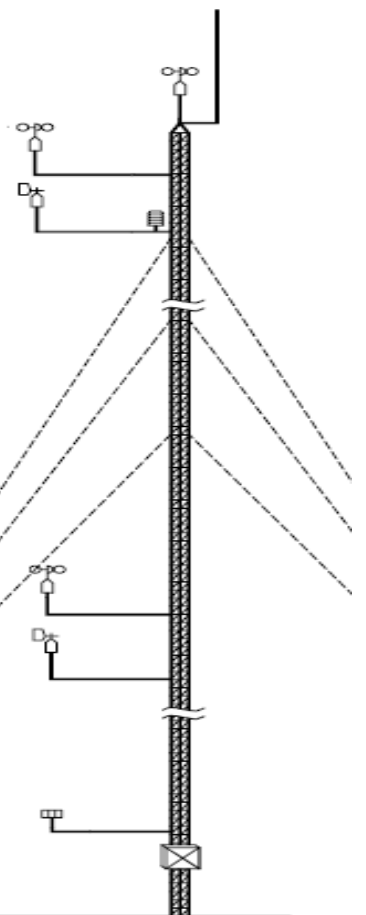
3.4M104

5M

6M

*MD70 MD7 MM70 5M 6M
MM82 MM92 3.4M104*

Model	Number of measurements	Number of measured turbines	Ratio EMAEP/GAEP [%] min / max results
Standard	5	2	98.9% 96.9 – 100.8
Standard	6	2	99.2% 96.1 – 103.2
Standard	2	2	101.9% 101.2 – 103.3
Standard	8	8	
Plus Option	1	1	100.9% 96.4 – 106.8
Evolution	6	5	
Standard	1	1	
Evolution	6	5	100.0% 98.2 – 102.1
Standard	3	3	100.4% 99.6 – 100.1
Standard	1	1	100.9% n/a – n/a
Standard	1	1	101.2% n/a – n/a
MD70 MD7 MM70 5M 6M MM82 MM92 3.4M104	40	31	100.4% 96.1 – 106.8



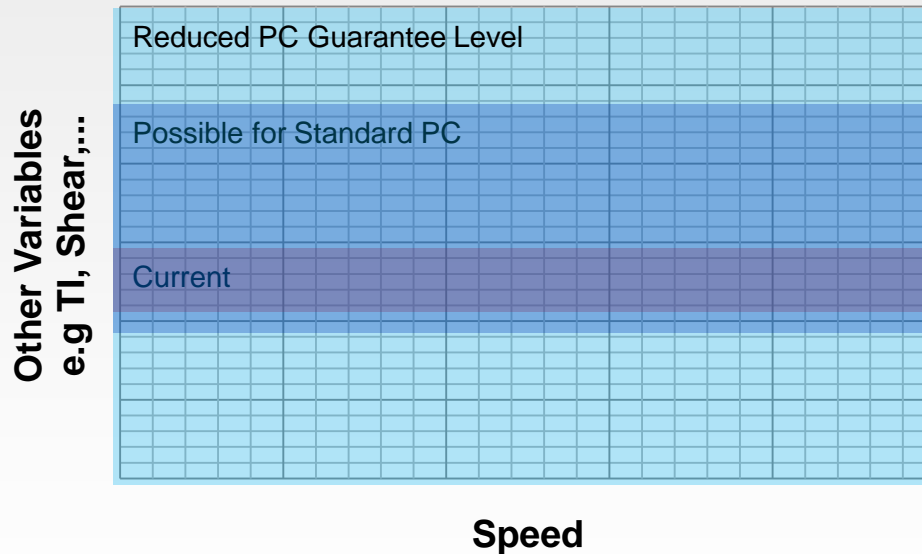


Thank you

© REpower Systems AG

All rights reserved. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photography, recording, or any information storage and retrieval system, without permission from REpower Systems AG.

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

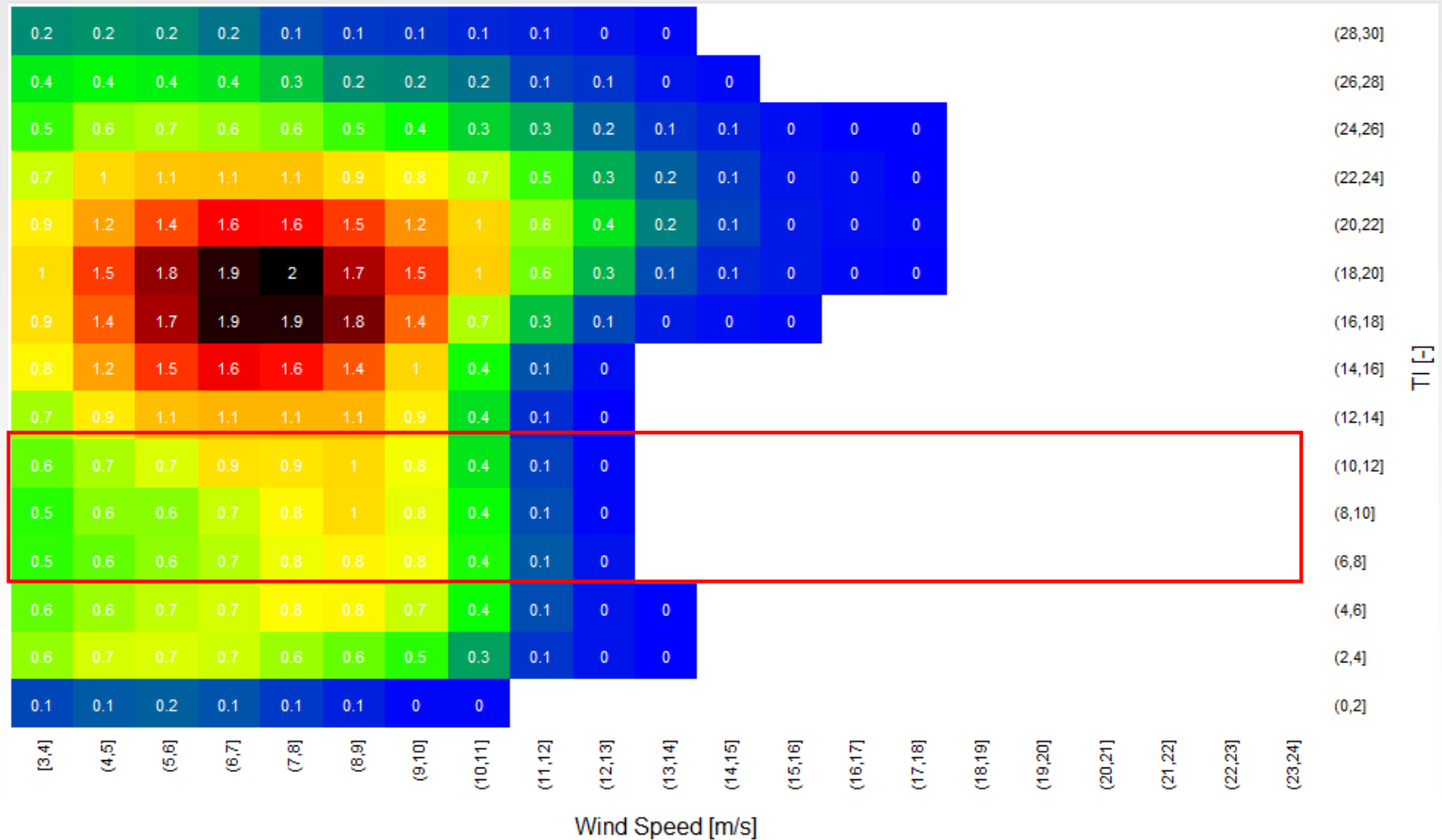


- Time series analysis, use relevant guarantee level for each time step

Site Specific Wind Distribution



Sample Site – data frequency





EWEA

Resource Assessment Workshop

Summary of Session:

Real World Power Curves

Tomas Blodau

26.06.2013



1. Report from Power Curve Working Group
 2. Vision of energy yield prediction
 3. Developments in power curve measurements
 4. Manufacturers views
- Better communication and cooperation
 - More value from better measurements
 - Understanding sites and wecs
 - Higher transparency
 - Reducing uncertainties

Science  Accuracy  Economy



Thank you

© REpower Systems AG

All rights reserved. No part of this document may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photography, recording, or any information storage and retrieval system, without permission from REpower Systems AG.