



13. JUNI 2018/ Eric Effern, windtest Grevenbroich

IEC-RE: Die neue Rolle der Leistungskurvenvermessung zur Verringerung finanzieller Unsicherheit von Windprojekten



windtest grevenbroich gmbh:



20 Jahre
Erfahrung

**Bestätigte
Qualität**

- ✓ DakkS/ILAC
- ✓ MEASNET
- ✓ IEC-RE



Robert Wilsch
Email: robert.wilsch@windtest-nrw.de
Tel.: 02181/2278-18

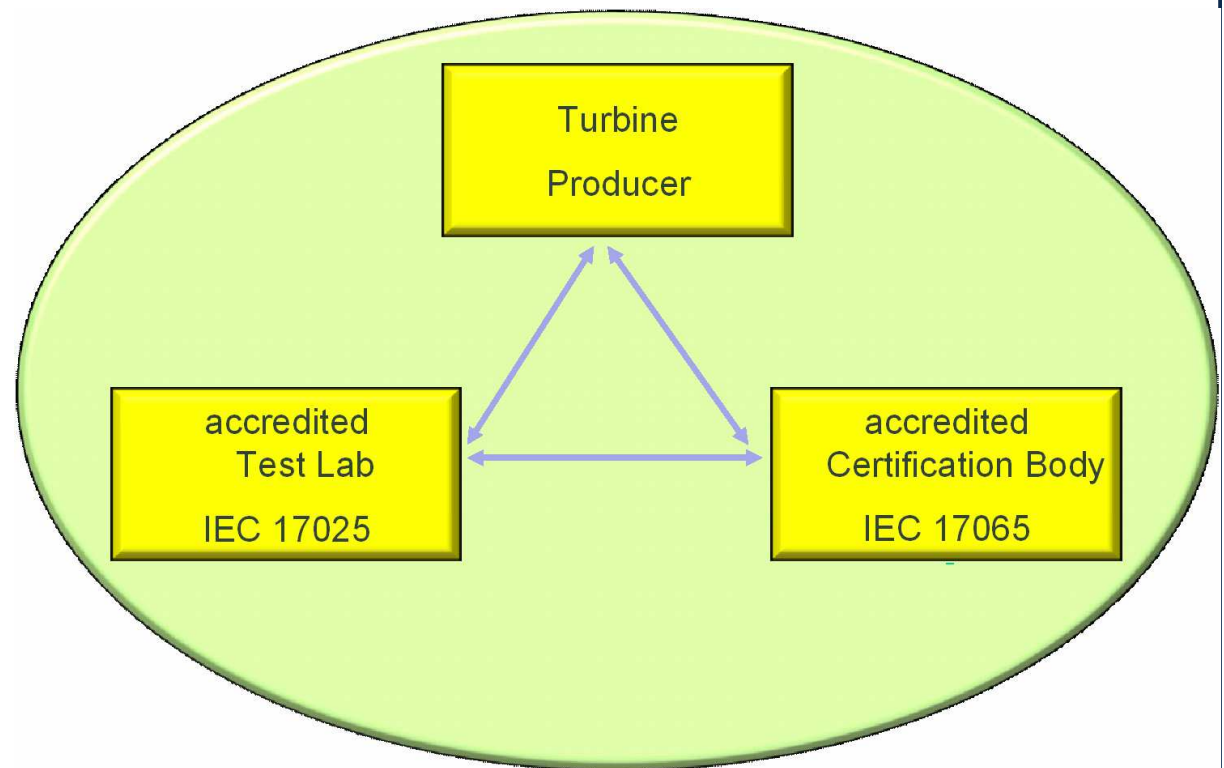


INHALT

- IEC-RE
- Certification and Power Curve Today
- Certification and Power Curve IEC-RE Approach
- Requirements for R&D

IEC-RE: Certification in good old Times

- Accreditation varies in procedures
- Accreditation varies in quality
- Assessments vary in quality
- End User ?
- Equal Influence ?
- Value of certificates ?





IEC-RE: The new System

Sectors: Wind, PV, Marine Energy





IEC-RE: Management Structure

IEC CONFORMITY ASSESSMENT BOARD, CAB
Oversees IEC Conformity Assessment policy and Systems, eg IECEE, IECEX, IECQ, IECRE

IECRE Management Committee, REMC
Overall management of the IECRE System

National Members (Countries)

Officers + Executive, Scheme Chairs, IEC Gen. Sec

Expert Working Groups (WGs) – as needed

IECRE Secretariat
Technical Support
Administration

WE OMC
Wind Energy
Operational
Management
Committee

National Members
TC 88 + SC Liaison
Committees + WGs

ME OMC
Marine Energy
Operational Management
Committee

National Members
TC 114 + SC Liaison
Committees + WGs

PV OMC
PV Solar Operational
Management Committee

National Members
TC 82 + SC Liaison
Committees + WGs



IEC-RE: Industry Benefits

- Mutual recognition
- Equal influence of member countries

1		Austria	7		France	13		Netherlands
2		Canada	8		Hungary	14		Spain
3		China	9		India	15		UAE
4		Denmark	10		Japan	16		United Kingdom
5		Egypt	11		Kenya	17		USA
6		Germany	12		Korea, Republic of			



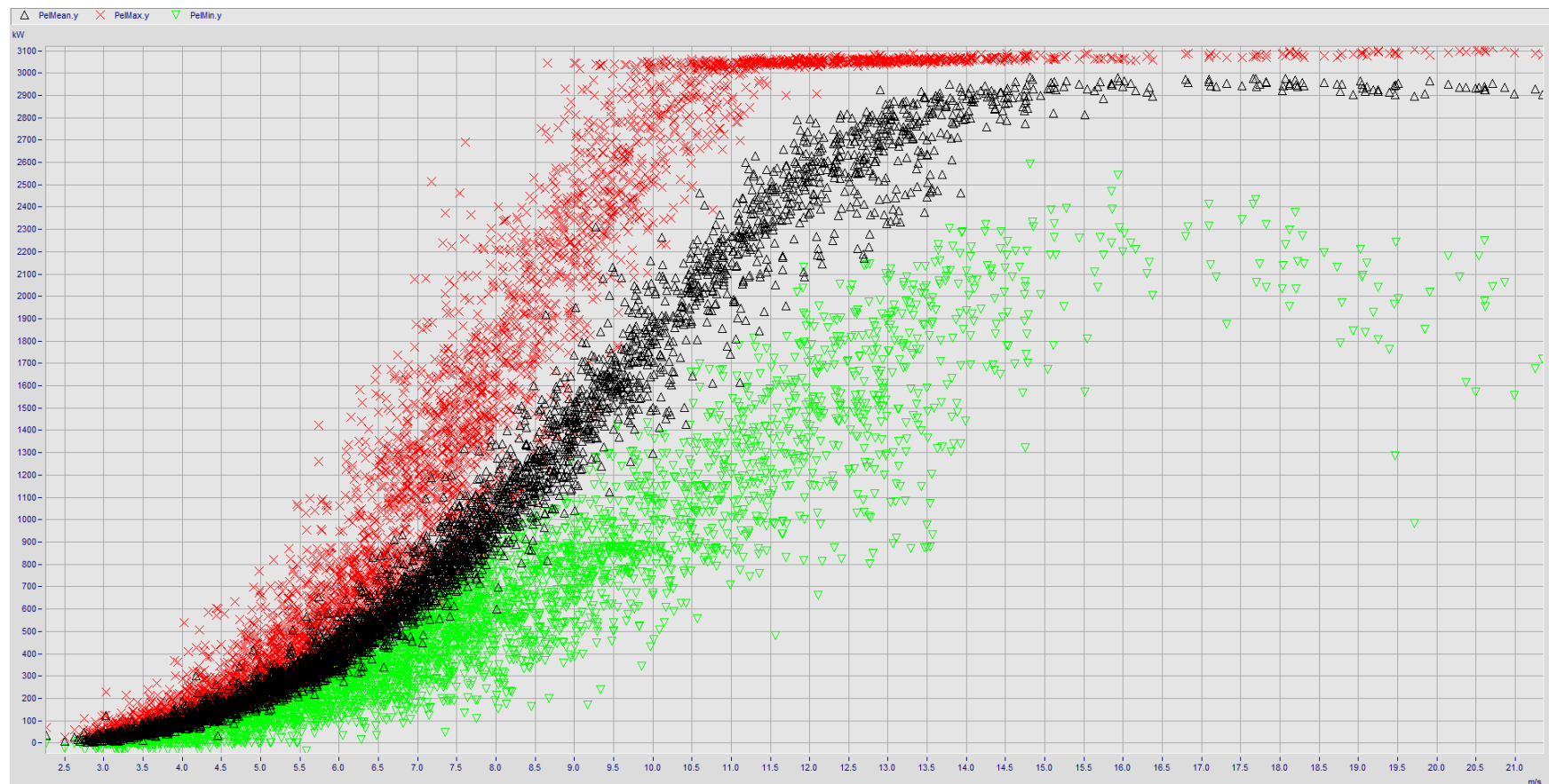
IEC-RE: Industry Benefits

- Equal influence of **stake holder groups**
 - Certifiers (Christer Eriksson, DNV-GL)
 - Test Labs (Eric Effern, windtest Grevenbroich)
 - OEMs (Toby Gillespie, GE)
 - End Users (Wallace Ebner, AIG)
- Consistent **assessments** for Certifiers & Test Labs
- Consistent **proficiency testing**
- **Clarification sheets**



Certification and Power Curve

- Power vs. Wind speed
- Measured on IEC site
- Usually 1 turbine state
- Normalized to sea level





Contracts and Power Curve

- Hunting for **0.1%** of energy production
- End Users request a **warranted power curve**
- OEMs warrant a power curve **+/- 1% to 3%**
- Part of project **contracts**
- **Underperforming projects**: dispute
- **Expensive** power curve validation
 - on non IEC sides
 - extra met mast
- **Dissatisfying** results

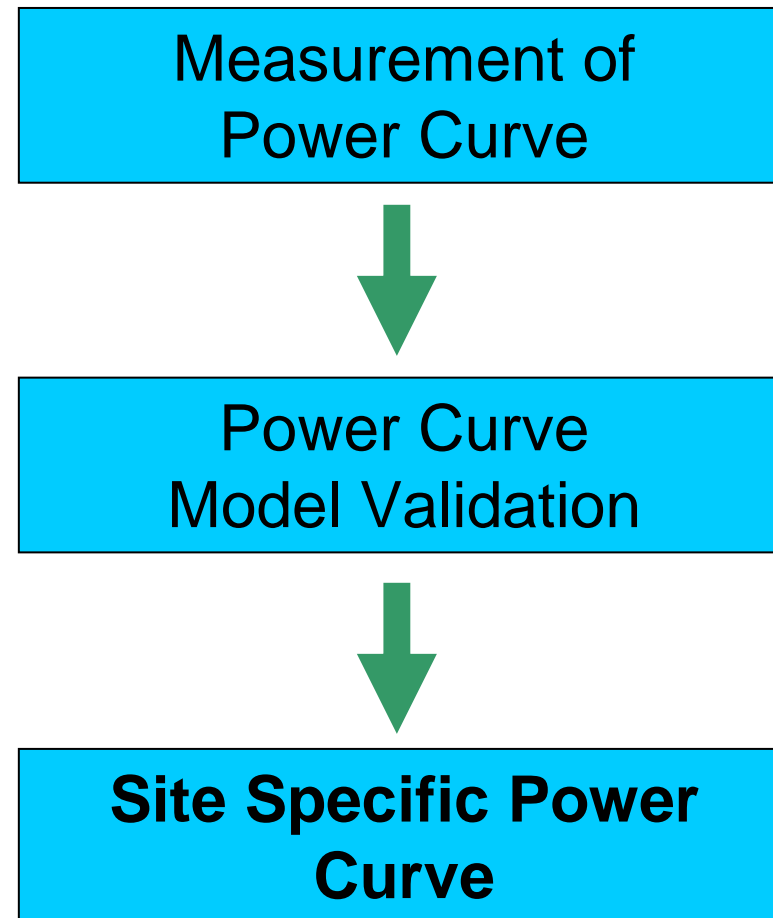


Influences on Power Curve

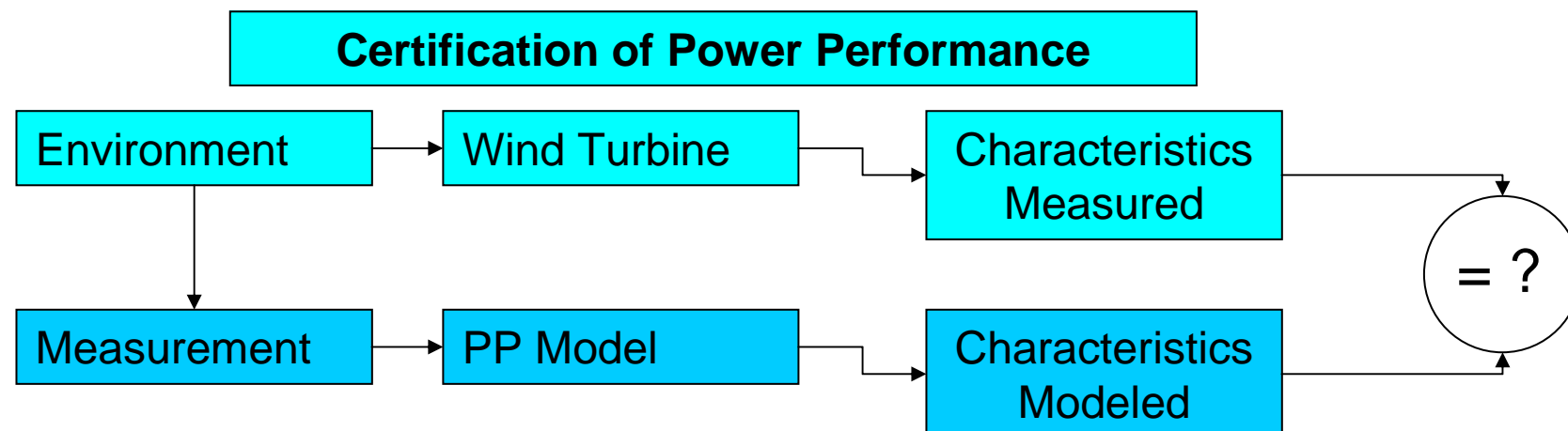
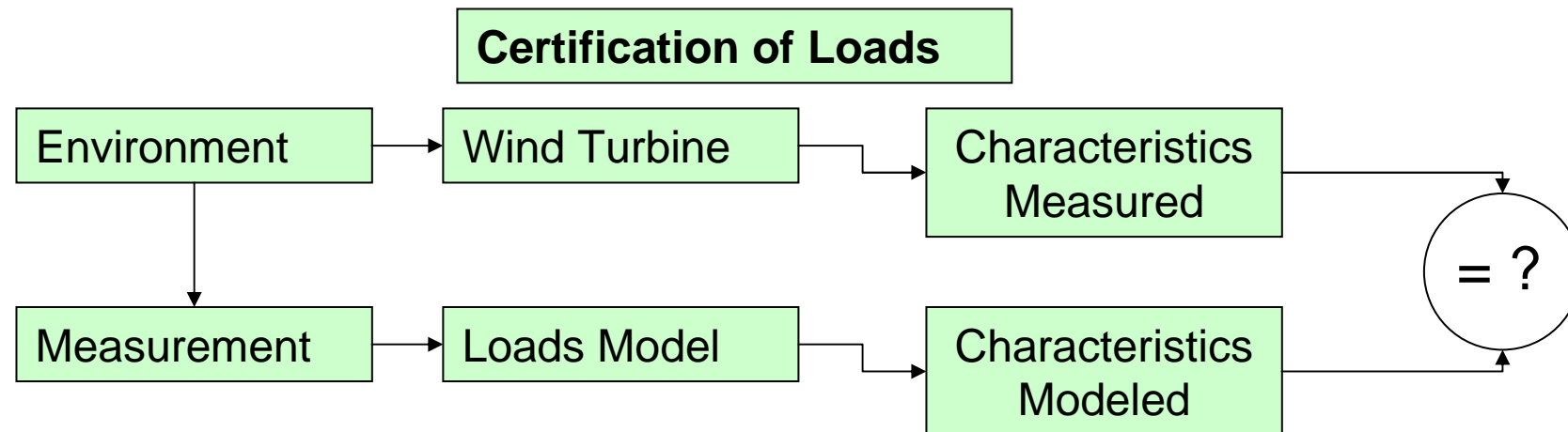
- Turbine Control
- Temperature
- Humidity
- Rain
- Wind Speed vs. height (shear)
- Wind direction vs. Height (veer)
- Wake
- Yawing concept vs. Wind direction variability
- Turbulence intensity



The new IEC-RE approach



The new IEC-RE Approach: Model Validation

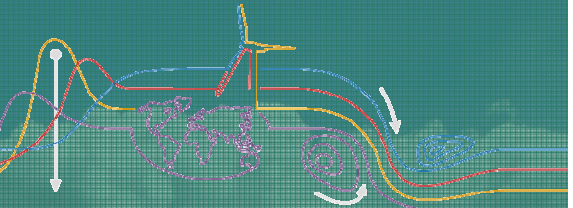




Required R&D

- Enhanced measurements (e.g. mast + lidar)
 - Which **positions** are needed ?
 - What **time resolution** is needed
 - What **accuracy** is needed
- Enhanced wind field models
 - What **volume resolution** is needed ?
 - What **time resolution** is needed ?
- Enhanced power curve models
 - How to model influencing parameters

Vielen Dank für Ihre Aufmerksamkeit



Eric Effern

windtest grevenbroich gmbh

Frimmersdorfer Straße 73a

D-41517 Grevenbroich

Tel. +49 (0) 21 81 / 22 78 17

eric.effern@windtest-nrw.de

