



China Wind Power (Training & Research) Project - CWPP

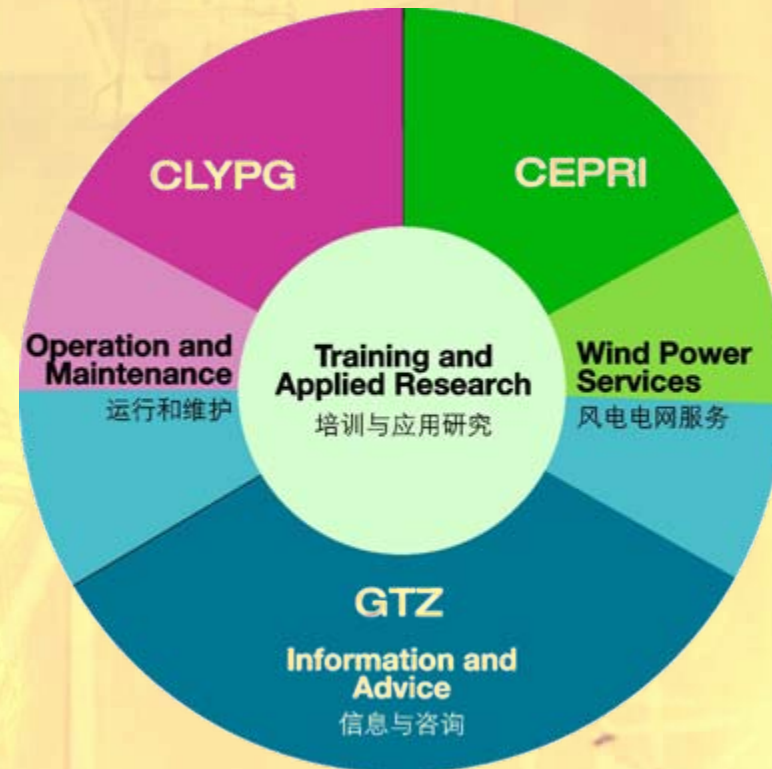
中国风电（研究与培训）项目

中德合作项目支持风电领域所有的参与者

Project duration 5 years – 2005/04 – 2010/03

Implementation-organisations:

- China Long Yuan Electric Power Group (**CLYPG**)
- China Electric Power Research Institute (**CEPRI**)
- GTZ** (put in charge by German **BMZ** – Ministry of Economic Cooperation and Development)
- Objective:** The technical capacity of private and state-owned institutions to implement and operate wind power projects is improved
- Value of German contribution 5 million €
- Consultant **decon GmbH** DuBois杜博斯(Andreas)





Partner for the Future. Worldwide GTZ at a glance

German Federal enterprise
HQ in Eschborn; 67 country offices

Major client BMZ / other international clients

Turnover: €885 million

Of which Int. Services €123 million

Ongoing projects: 2.700

GTZ staff

Germany & abroad 2.400

National personnel 7.100





Work Area 1: Operation & Maintenance @ CLYPG

工作领域 1: 运行及维护 @ 龙源电力集团公司

Establish Wind Power Technician Training School at Suzhou 建立苏州风电技工学校

- Support training of trainers and course development
教员培训和教材的编写

Improve Operation of Windfarms - 风电场运行的改进

- Assess technical problems in windparks
风电厂技术问题评估
- Suggest remedies for problems
提出改善运行及风电场收益的方法

Introduce advanced wind power support technologies - 介绍先进的风电技术

- Vibration Analysis - 震动分析
- Condition Monitoring Systems – CMS - 境监控系统 - CMS
- Remote Windfarm Operational Monitoring & Technical Management
偏远风电场运行监控技术管理



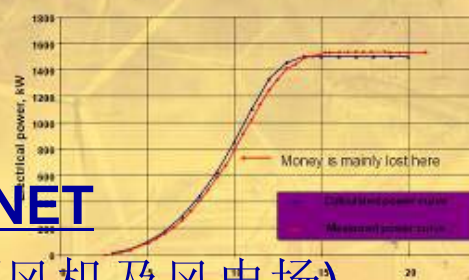


Work Area 2: Wind Power Services @ CEPRI

工作领域 2: 风能服务 @ 中国电力科学研究院



Differences in power curves 功率曲线的差别



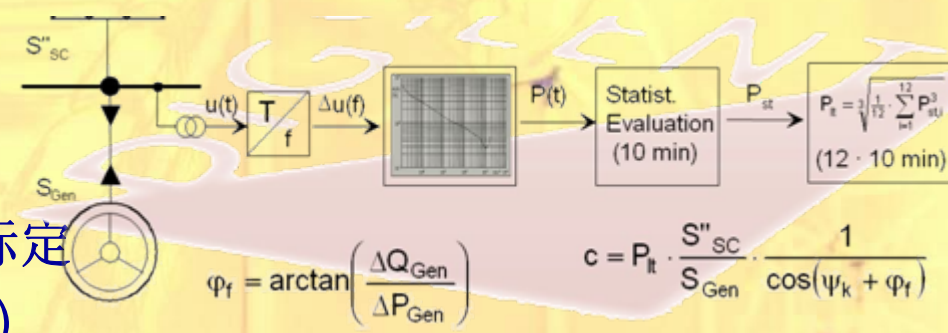
Center for - 中心:

- Wind Power Grid Integration Planning - 并网规划
- Wind Resource Assessment 风资源评估 (LIDAR)



Wind Turbine Testing Lab according IEC61400 & MEASNET

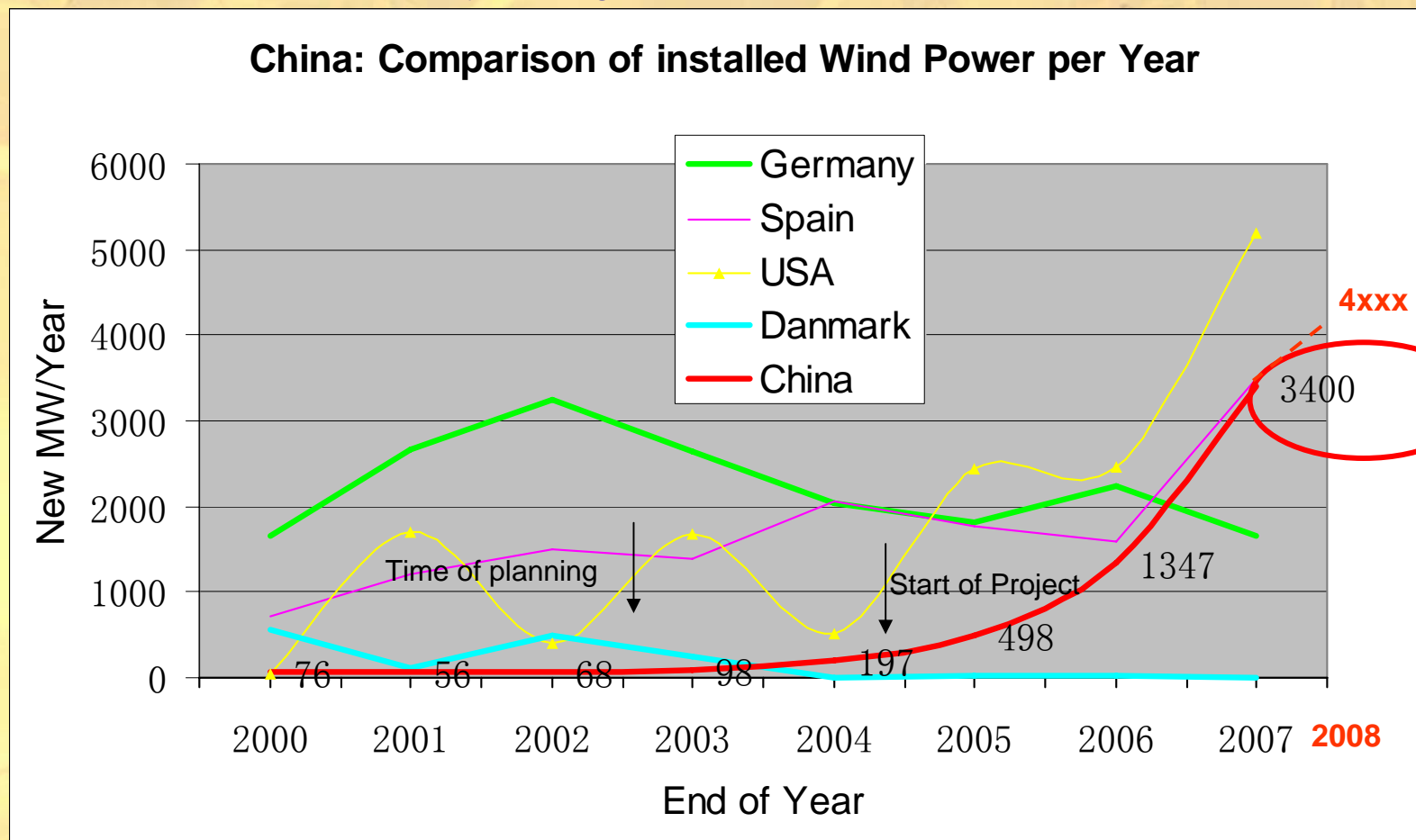
- Power Quality of Turbines & Windfarms - 电能质量评估(风机及风电场)
- Power Performance Assessment (power curve verification) 功率特性评估(功率曲线确认)
- Noise Measurement - 噪声测量
- Load Measurement - 负荷测量
- Anemometer Calibration - 风速计标定
- LVFRT - Testing (so far only advise)





CWPP ↔ Reality 2008 风电咨询与培训项目 ↔ 2008年现状

- Project planned in 2003 风电咨询与培训项目于2003年开始规划
- How has “wind-power-reality” changed? 风电装机容量的发展变化



Support needs different size & measures



WERT-Center

Wind Environment Research & Technology Center

PHASE 1: 2008/11 – 2010/02

■ WERT-Test:

- Advanced Wind Turbine grid testing, especially Low-Voltage Fault-Ride Through (including LVFRT-Test Hardware from Germany)
- Wind Farm Grid Code compliance testing
- Support for development of locally adapted versions of standards and their practical evaluation under Cold Climate Conditions at a test wind turbine

■ WERT-Training:

- Certificate courses for large numbers of engineers as a combination of ONLINE-Internet and Class-Room training as well as practical training and applied research at a test turbine