

National Wind Power Integration Research and Test Center(NWIC) of China

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Background

2

Wind power integration in China

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Experiences in international cooperation

4

Activities of CEPRI in wind power sector

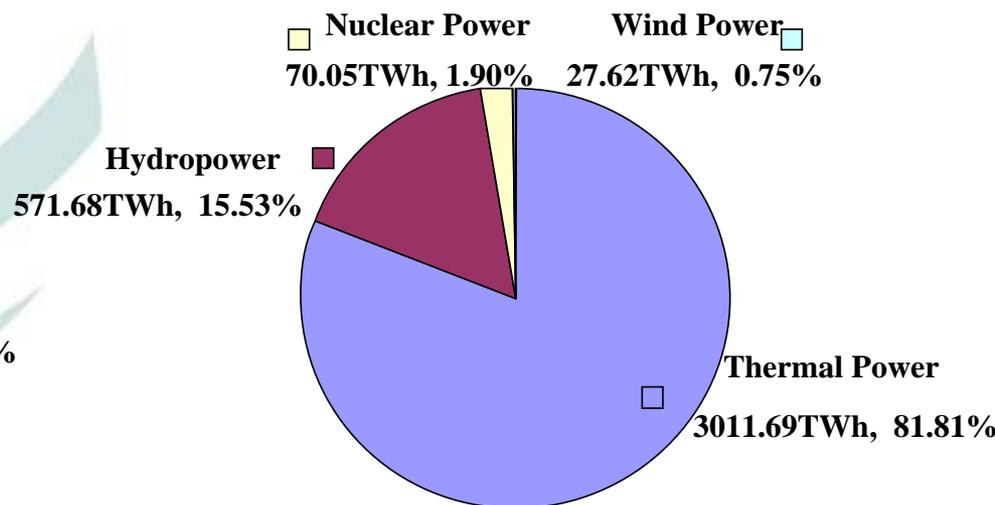
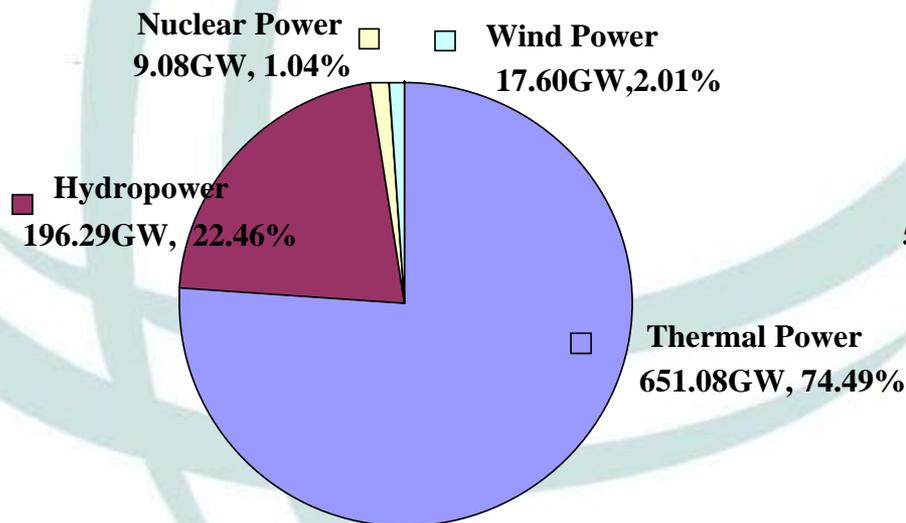
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Suggestions

I Background

In end of 2009, total installed capacity in China reached to 874.1GW, including 17.6GW grid-connected wind power (accounts for 2.01%).

In 2009, total annual generation of electricity in China was 3681.04TWh , including 27.62TWh wind power generation (accounts for 0.75%) .



I Background

Growth of Wind Power in China:



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2 Wind power integration in China

Policies and rules

Renewable Energy Law :

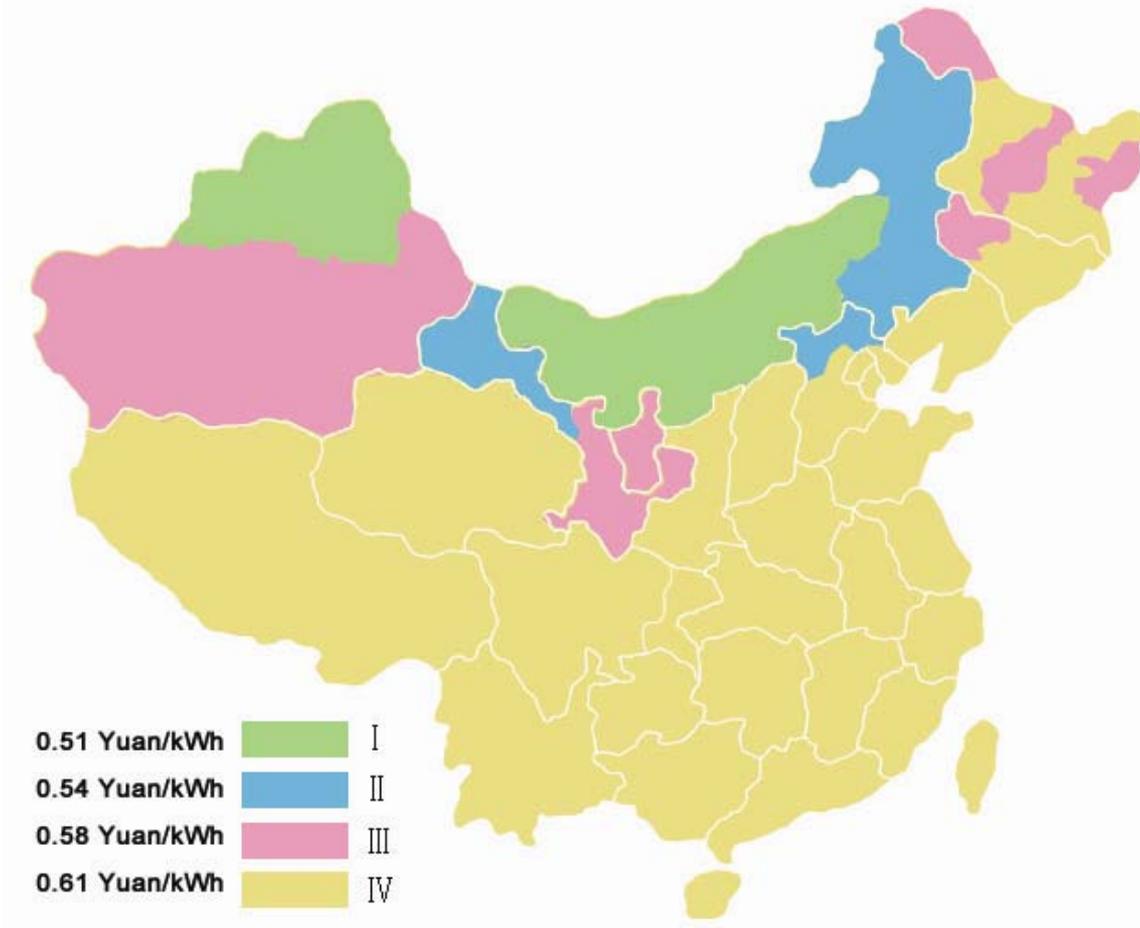
- Issued on 28 /2 / 2005
- Took force on 1 /1 / 2006
- An amendment was passed in Dec., 2009

- Full amount, guaranteed purchasing principle for electricity produced from renewable sources ;
- A detailed plan needed for wind power development;
- electricity produced from renewable sources should meet the requirements of national/industrial standards.

2 Wind power integration in China

Policies and rules

Feed-in-tariff regulation:



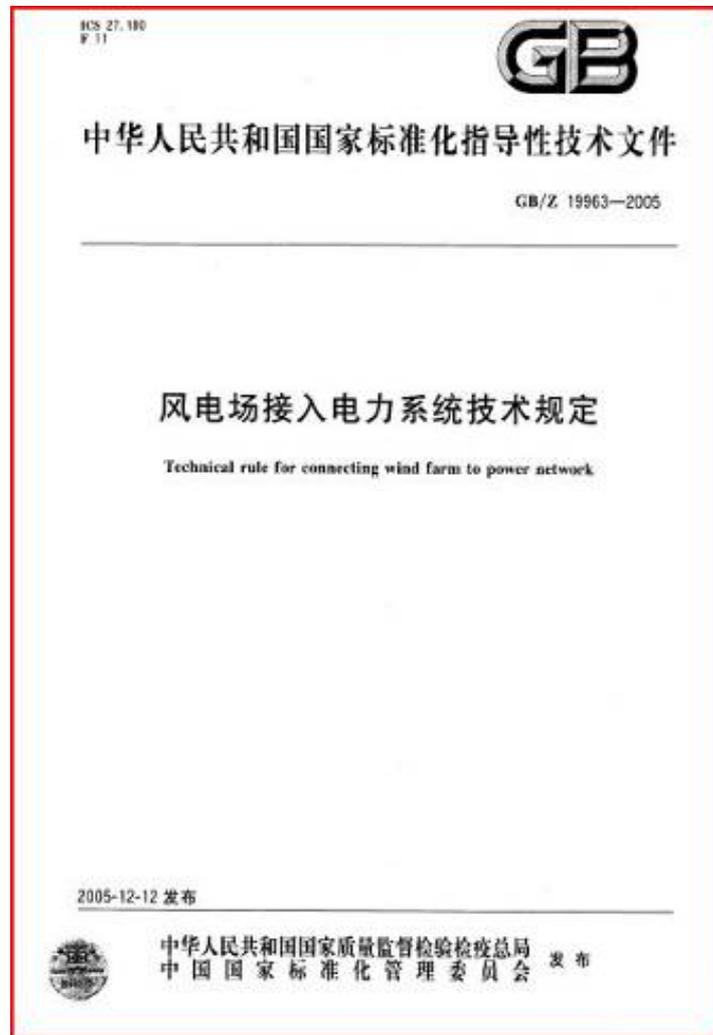
2 Wind power integration in China

Policies and rules

Wind Power Integration Standard

- **Technical Rule for Connecting Wind Farm to Power Network**

- Reactive power control
- Active power control
- Low voltage ride through capability
- Wind power prediction
- Power quality
- Compliance Test



2 Wind power integration in China

Solutions and Technologies

Generation System

- Grid-friendly generation technology
- Wind turbine test and certification

Transmission System

- Large-scale wind power transmission planning ;
- FACTS and VSC-HVDC technology ;
- Offshore transmission technology.

Distribution System

- Evaluation and planning technology ;
- Operation and control technology ;
- Demand response/ dispatching technology.

- **Performance of large-scale wind power base ;**
- **Wind power prediction technology ;**
- **Wind power dispatch and operation technology.**

Dispatch Technology

Support

Fundamental Researches

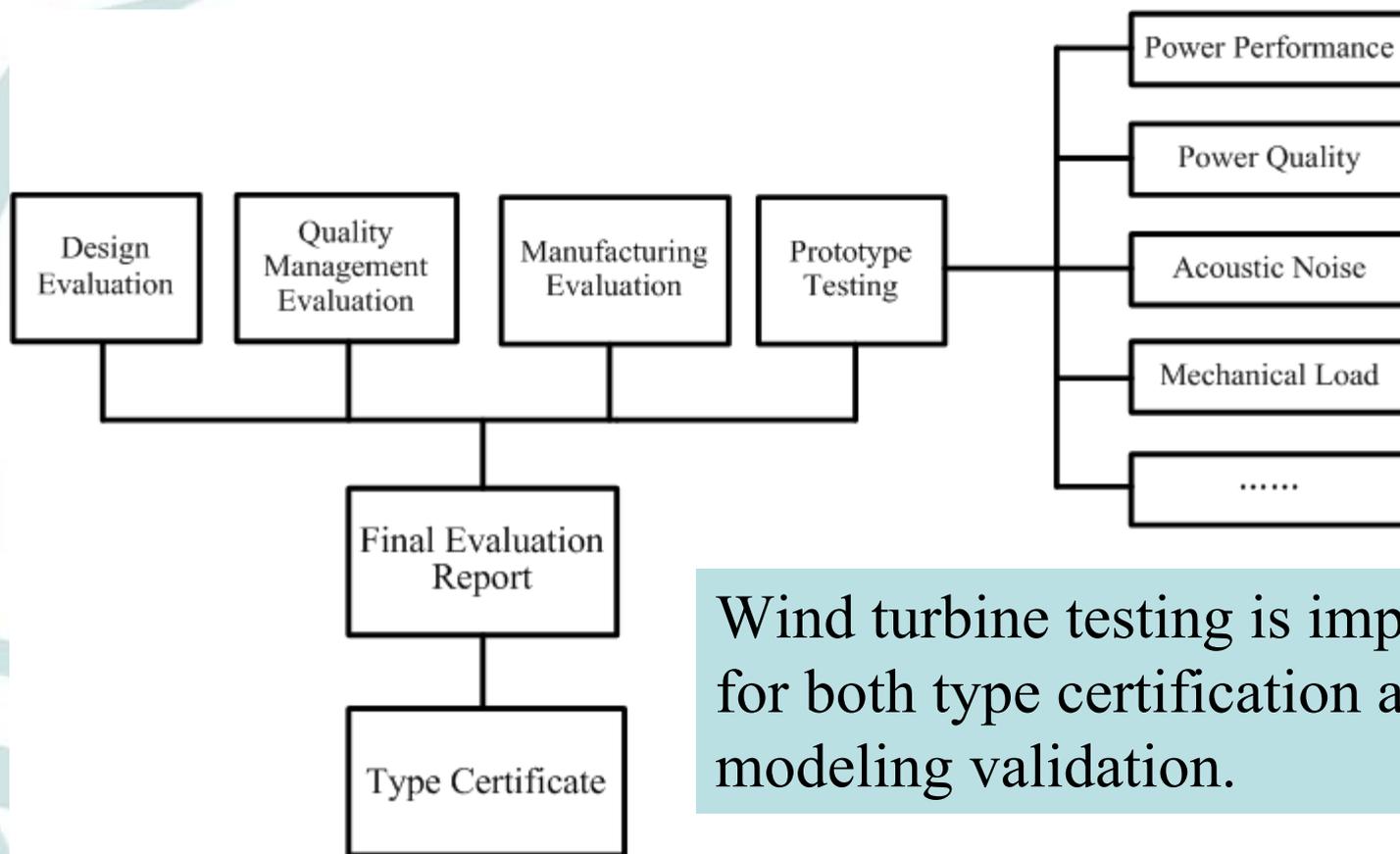
Test Site

Support

2 Wind power integration in China

Key Technologies

Wind turbine test & certification :



Wind turbine testing is important for both type certification and modeling validation.

2 Wind power integration in China

Key Technologies

Purpose of wind turbine testing :

1

Ensure wind turbine quality

2

Ensure the IRR of wind farm project

3

Ensure grid safety and power quality

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Key Technologies

Technical & management system :

1

Testing institution shall meet the requirements of ISO/IEC 17025 standard

2

Technical ability include:

1. Calibrated test equipments
2. Professional staff
3. In-depth understandings of standards
4. Verified test results

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3 Experiences in international cooperation

Project Background

2. MoFTEC of China approved and initiated project together with *German Ministry for Development & Economic Cooperation (BMZ)* in May, 2001

4. 'Wind Environment Research & Training Center (WERT-Center) ' Project supported by *German Federal Ministry for the Environment, Nature Conservation and nuclear Safety (BMU)* started in Nov., 2008; Project sum: 4 million €



1. Project proposals prepared by CEPRI and forwarded to SGCC in Feb, 2001

3. CWPC - China Wind Power Center Project started in Apr., 2005 with five years execution period, Project sum: 5 million €

3 Experiences in international cooperation

Project planning :

- 1 Project plan shall consider the demand in the country
- 2 Project outputs should be widely used in wind power industry
- 3 Project partners should be focus on their strong points
- 4 Knowledge transfer should be done by workshops/training
- 5 Project should contributes to wind power industry

3 Experiences in international cooperation

International Experts :

LTE:

- Rich experiences in various aspects of wind power;
- Being clear about the need of all partners and their advantages/disadvantages.
- Fully understand the custom and culture of the country

STE:

- Professionals in wind power, such as wind resource assessment, grid integration, wind turbine testing, etc.
- Ability to communicate to local partners.

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4 Activities of CEPRI in wind power sector

CEPRI, an institute founded in 1951, is affiliated to SGCC

- Renewable Energy Department(RED) was established in 2006 due to the contribution of CPWC project;
- In Jan of 2010, NEA approved CEPRI to build a national level center titled “National Wind Power Integration Research and Test Center (NWIC)”, which includes the existing RED and the wind turbine test site located in Zhangbei, Heibei, China

4 Activities of CEPRI in wind power sector

Current Status :

- Specialized in research & development, testing, consulting and training in wind power field
- 102 staff, including 5 professors, 27 senior engineers, 32 PhDs

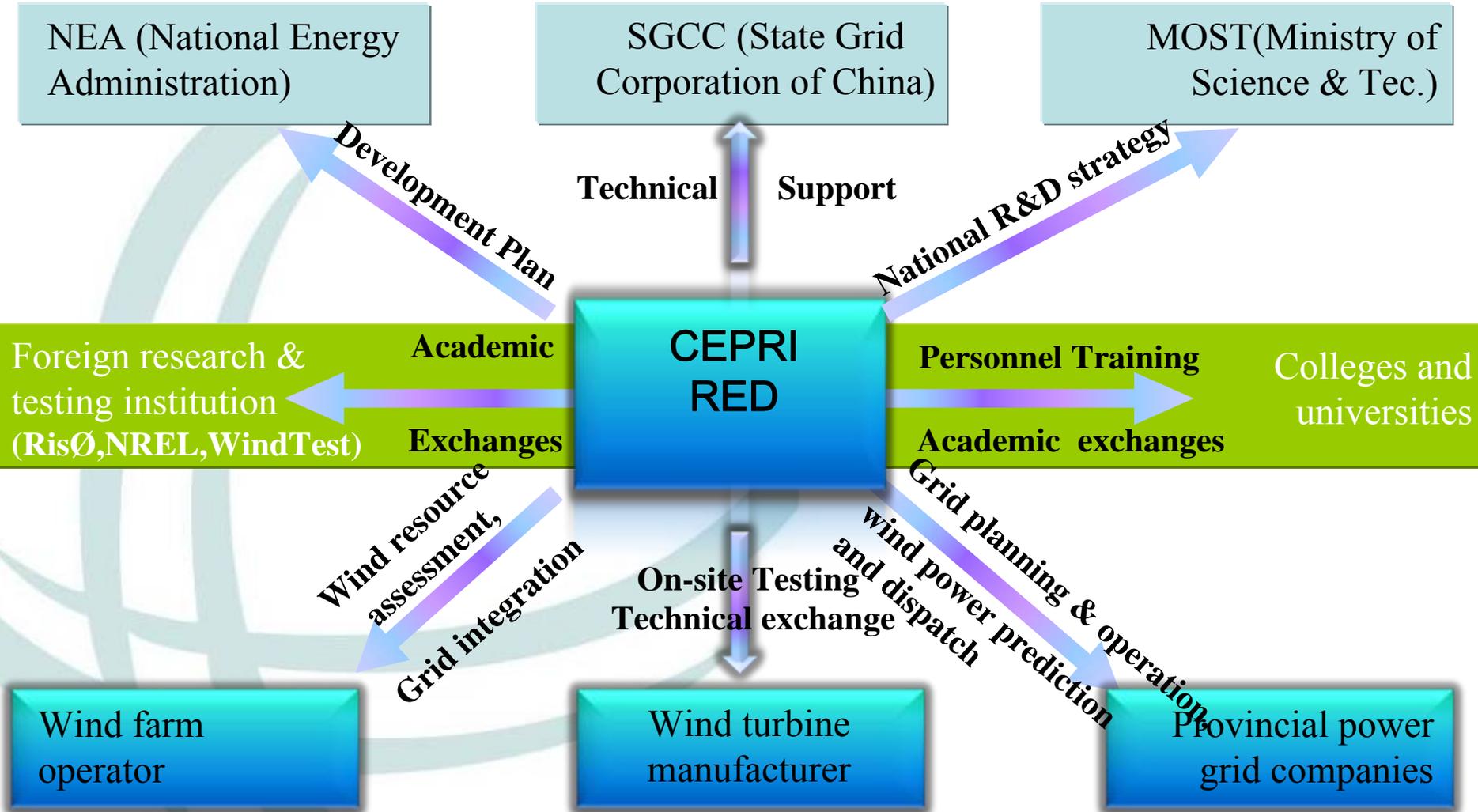


4 Activities of CEPRI in wind power sector

Income



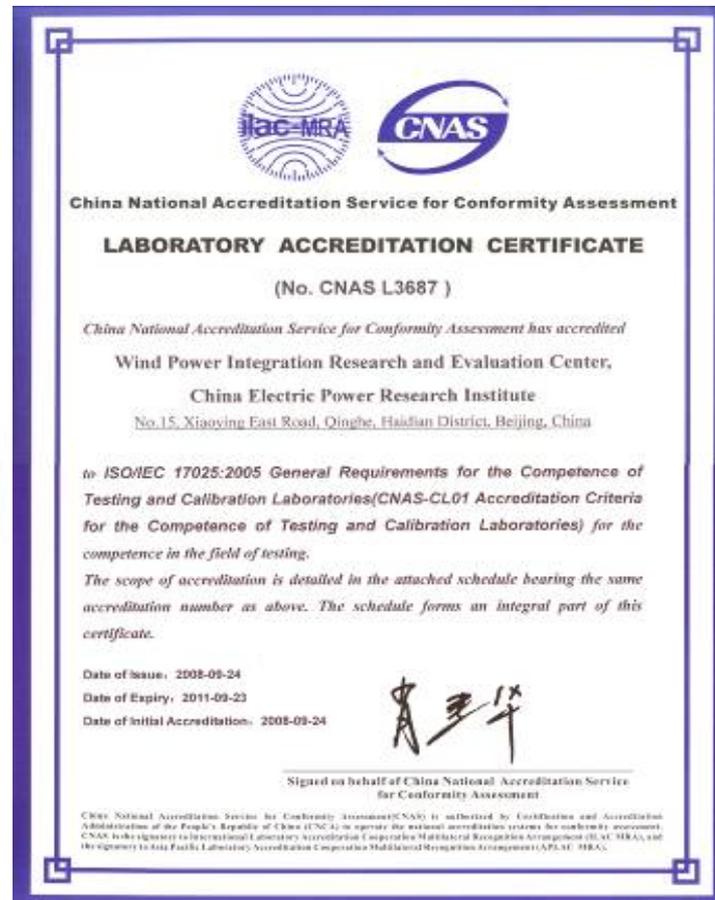
4 Activities of CEPRI in wind power sector



4 Activities of CEPRI in wind power sector

Laboratory Accreditation:

- **China National Accreditation Service for Conformity Assessment(CNAS) Accreditation**
- **Accredited Services:**
Power Performance , Power Quality and Noise Measurements of Wind Turbines



4 Activities of CEPRI in wind power sector



国家电网
STATE GRID

National Wind Power Integration Research and Test Center (NWIC)

- Located in Zhangbei, Heibei province
- Advanced test site for maximum 30 wind turbines
- LVRT equipment and grid simulator with capacity of 6MW
- 2.5MW battery storage system
- 640kW PV system for research and test.
- Fundamental research platform



4 Activities of CEPRI in wind power sector

Why we need it:

1

Meet the requirements of wind turbine manufacture, all test items specified in IEC & national standards can be done here;

2

Carry out experimental studies on wind power technologies, such as wind resource assessment, anemometer calibration etc.

3

Conduct professional training and public training, as this center including different types wind turbines, PV systems and energy storage device.

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5 Suggestions

- Project planning should be based on the wind power development plan and actual demands of wind power industry in South Africa;
- Local contributions and sustainable development mechanism are two important issues to be considered at the planning stage.
- Technical standards and professional trainings are necessary to achieve sustainable development of wind power in South Africa.
- Research, test, consulting and training are highly correlated and promote each other.



Thank you for your attention!

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