



TÜV NORD Wind Energy
TÜV NORD 风能

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Company Profile

公司介绍



TÜV NORD GROUP is one of the world-leading technical provider with over 150 branches in more than 70 countries. Down its development path of more than 150 years, TÜV NORD has grown from a traditional steam boiler inspection organization to a technology service company officially authorized by German government. Expanding and improving its services unremittingly, TÜV NORD has now become one of the world's top ten certification authorities.

作为全球领先技术服务专家，TÜV NORD集团在全球70多个国家设有超过150家分支机构。在超过150年的发展历程中，TÜV NORD从最初的“压力容器检验协会”，到成为德国官方授权的技术服务公司，持续拓展服务范畴，完善服务，迄今已发展成为全球十大认证机构之一。

The core services of TÜV NORD GROUP mainly include testing, inspection, certification, assessment, education and engineering, which covers a wide area of expertise in industry, energy, railway, mobility, environmental protection, IT, natural resources, aerospace, education & training and staff qualification training, etc.

TÜV NORD集团核心服务主要体现在测试、检验、认证、评估、教育及工程，涉及行业包含：工业、能源、铁路、车辆、环境保护、IT、自然资源、航空航天，以及变得越发重要的教育培训及员工资质培养等。

Wind Business Introduction

风能业务综述



TÜV NORD is an independent third party authorized by German government, DAkkS, BSH, CNAS and a registered body listed by Danish Energy Authority (DEA).

TÜV NORD是由德国政府、DAkkS、BSH、CNAS授权的独立第三方认证机构，同时也是由丹麦能源管理局(DEA)注册列名的认证机构。



We dedicate to providing a comprehensive range of certification and services for manufacturers, installers, suppliers and investors from Wind. Products with 'TÜV NORD' mark, which symbolizes safety and guarantees and receives recognition from global purchasers and consumers widely, is in compliance with relevant European certification standards and requirements. Our international recognized certification marks increase the marketability of your products all over the world.

我们致力于为制造商、安装商、服务供应商及投资商提供风能发电系统整个产品供应链的全方位认证及评估服务。“TÜV北德”标志象征着安全与保障，携带该标志的产品符合相关欧洲认证标准及要求，得到全球采购商和消费者的广泛认可。我们的国际认证标志使您的产品在国际市场更具竞争优势。

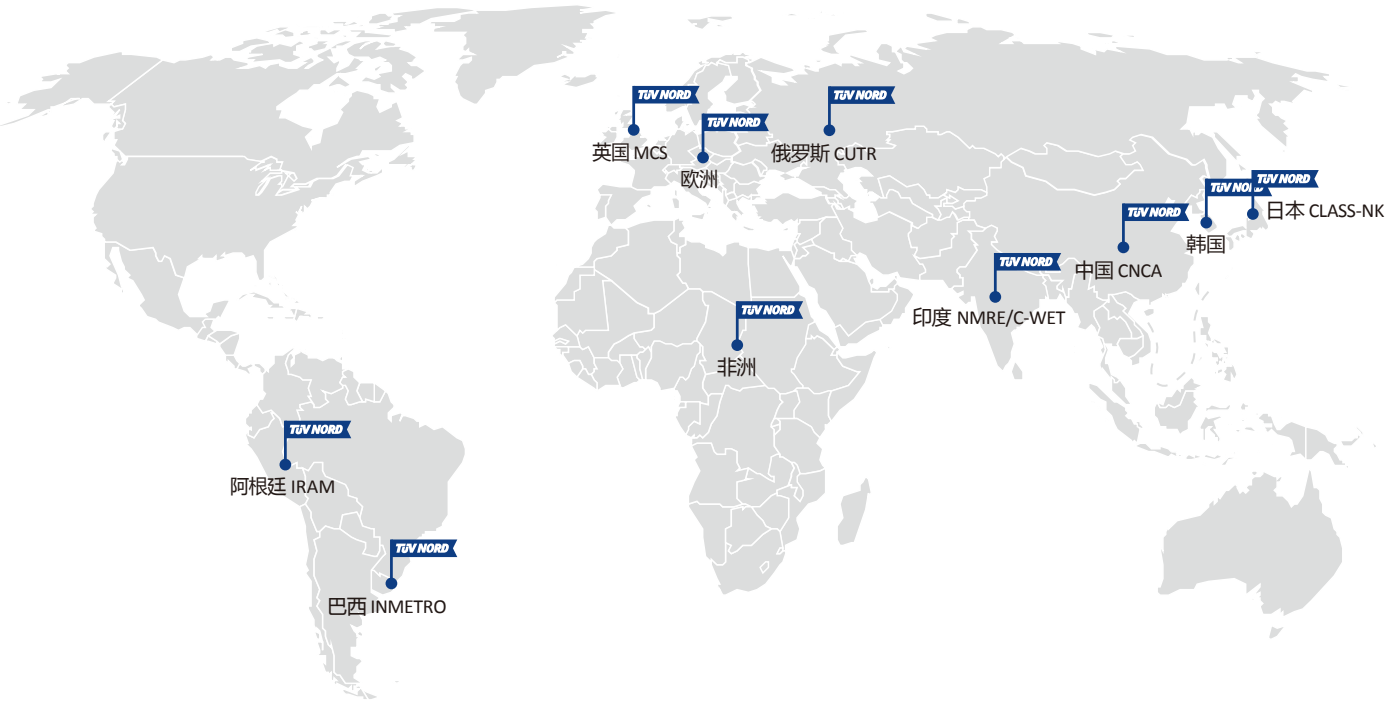
TÜV NORD Group possesses rich resources of wind energy service both in China, Indian, Brazil, Turkey and Europe. Our labs with 100% certification and evaluation ability of Wind turbine generator system and components are accredited in compliance with the ISO / IEC 17065 / 17020 norm, equipped with top-class technical experts. The large capacity of certification, evaluation ensures your wind products could be certified immediately as soon as we receive them. Therefore, the whole period of certification and evaluation will be shortened and your products become more competitive at global market in short time.

TÜV北德集团在中国大陆、印度、巴西、土耳其以及欧洲本土等分支机构都拥有丰富的风能认证、评估及检测实验室资源。这些分支机构已通过ISO / IEC 17065 / 17020认可，具有100%风电机组及零部件的认证及评估能力，并配备优秀的技术专家。让您的认证需求可以得到快速响应，缩短整个认证周期，助您在短时间提高全球市场竞争力。

A World Leading Wind Industrial Service Provider

世界领先的风能服务提供者

Global Market Access 全球市场准入



Professional Technical Services Provided by TÜV NORD International Team TÜV北德国际化团队的专业服务

With rich experience of certification and inspection for onshore and offshore wind turbines and wind farm, our international team provides you professional technical services. Our experts will always be your strong support and help you to reach business goals efficiently.

TÜV北德国际化的团队拥有丰富的陆上风场、风机及海上风场、风机的认证及评估的经验，向您提供专业化的技术服务。我们的专家一如既往的给予您强大的技术支持，助您快速、有效地达到业务目标。

One-stop Service, Multi-certifications 一站式服务，多种认证

As members of IECEE/IECRE, widely recognized report and certificate. From project evaluation, management systems building, to quality management and control, supplier management, products improvement and optimization, global market access analysis. What we do is to help company better growth.

作为IECEE和IECRE互认体系成员，广泛认可的报告证书。从前期的项目评估、管理体系的建设、到生产过程中工艺质量管控、供应商管理、产品技改分析优化、全球外市场准入分析等，所有的一切都是为了能够帮助企业更好地成长。

Customized Service Based on Market Demand
根据市场需求衍生的定制化服务

- Wind Turbine Technical Improvement Evaluation
风电机组技改评估
- Wind Turbine Life-extension
风电机组延寿
- Conditioning Monitor System Evaluation and Certification
CMS评估及认证
- Site Assessment / Risk analysis / CFD
场址评估 / 风险分析 / CFD分析
- 2nd and 3rd Party Inspections
第二 / 三方检验
- Load Extrapolation acc. to IEC 61400-1 Ed.3/Ed.4
基于IEC 61400-1, 第三版和第四版的载荷外推
- TBA / PBA Evaluation for Wind Turbines and Wind Farm
关于风机及风场的TBA / PBA评估
- Compliance with Local Grid Codes / LVRT Measurements
当地电网要求 / LVRT测试
- Assessment of Grid Connection Concepts and Power Quality Measurement
电网并网评估及电能质量分析
- Assessment of Functional Safety
功能安全的评估
- Geotechnical Assessment
地质评估
- Foundation Design Assessment for Wind Turbines
风电机组地基设计评估
- Assessment of Global Marketing Regulation
多国准入法规评估
-



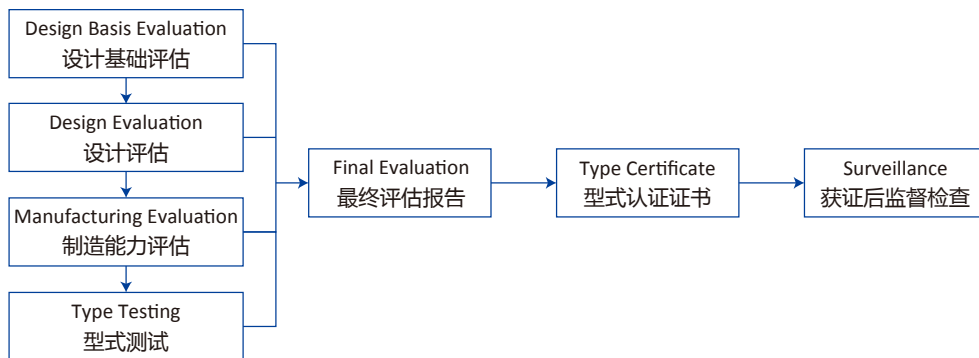
Certification Mode for WTGS and Project Certification

风电机组及项目的认证模式

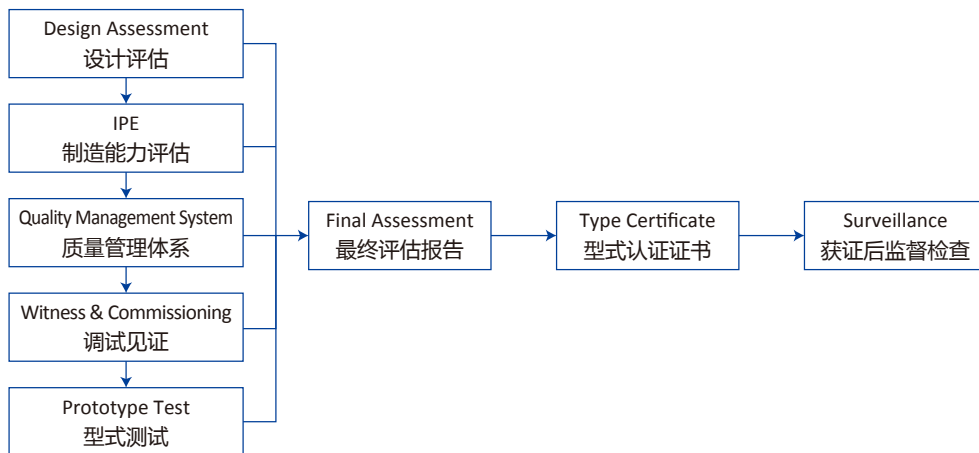
WTGS Type Certification

风电机组型式认证

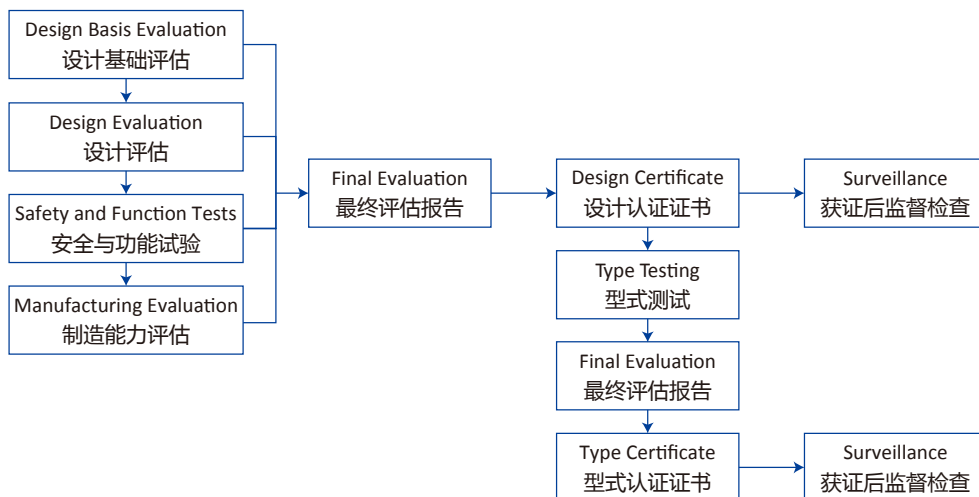
- Type Certification of Wind Turbine Based on Standard IECRE OD 501 / IEC 61400-22 / GB/T 35792 基于标准IECRE OD 501 / IEC 61400-22 / GB/T 35792



- Wind Turbine Type Certification Based on GL Guideline / DNVGL Standard 基于GL准则和DNVGL标准的风电机组认证

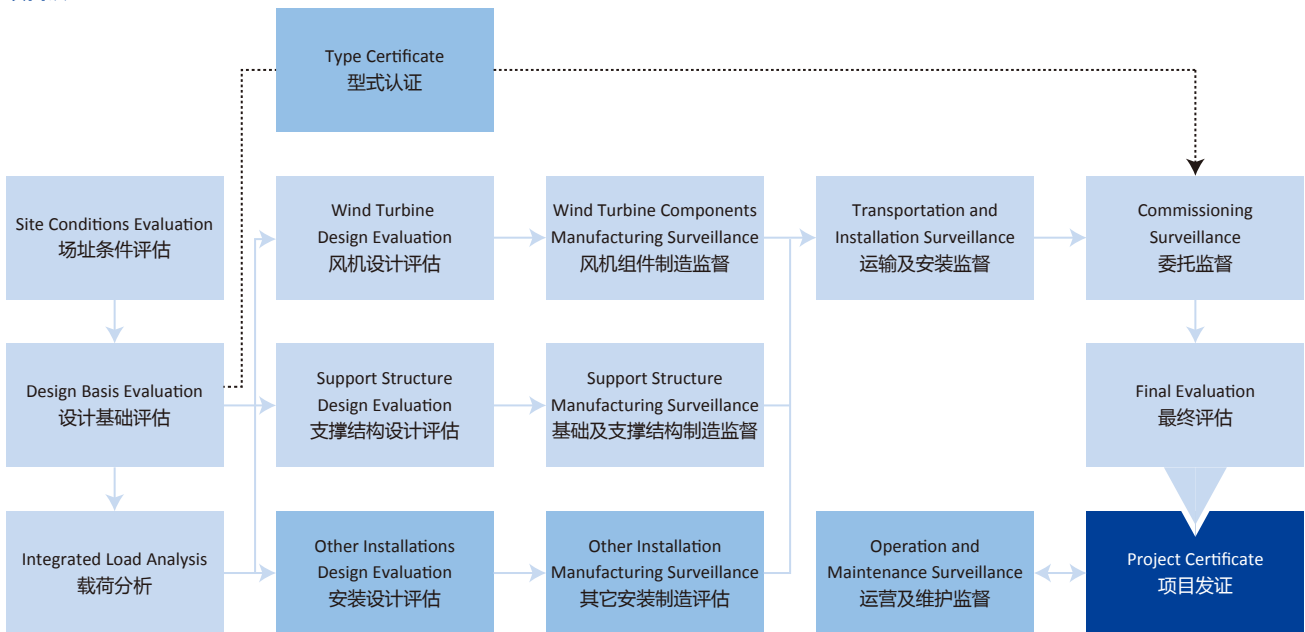


- Wind Turbine Certification Based on GB/Z 25458 基于GB/Z 25458的风电机组认证





**Project Certification
项目认证**



Project Certification of Wind Turbines (acc. to IEC 61400-22)

In a project certification it has to be approved for a specific site that type certified wind turbines and foundation designs meet requirements governed by site-specific external conditions and are in conformity with applicable local codes and other requirements relevant to the site. On the basis of applicable measurements and / or local standards the site specific external conditions, such as wind and wave distribution, wind farm effects, earthquake and temperature conditions, (sea-)ice, soil and electrical network conditions, have to be evaluated. Within the foundation design and installation evaluation the certification body observes by independent inspections – based on the certified specifications and manuals – the conformity of the foundations and support structures respectively the installation and commissioning procedures. Operation and maintenance surveillance is an optional module of the project certification and includes periodical inspections of the wind turbines and random checks of the maintenance procedures.

项目认证中的风机及基础设计应已经过型式认证且满足具体场地的及外部条件的相关要求，且符合与场地相关的载荷要求。基于可适用的测量及或当地的场地外部条件，如风速、海浪的分布，风场效应，地震及温度条件，结冰，土壤及电网条件，均应被评估。在基础评估及安装评估中，认证机构通过独立检验来观察—基于认证过的说明书及手册—基础及支撑结构的各自的安装及试运行的符合性步骤。运行及维护监造为项目认证的可选模块，且包含了风机的周期性检验及维护步骤的随机检查。

Onshore Wind Turbine Service

陆上风电服务

Type Certification for Wind Turbine

风机型式认证

- Design Assessment / Certification
设计评估 / 认证
- Manufacturing Assessment
制造评估
- Type Testing
型式测试
- Components Certification
部件认证

CE Certification for Wind Turbine System

风机系统的CE认证

- Wind Turbine Generator CE Certification
风机的CE认证
- Wind Turbine Components CE Certification
风机部件的CE认证

Wind Farm Certification (Project Certification)

风场 (项目) 认证

On Site Services for Wind Turbine

风机现场服务

- End of Warranty Inspection
出质保检验
- In-service Inspection
在役检验
- Site Assessment and Duty Diligence
场址评估及尽职调查

Services for Grid-connection Service

并网相关服务

- BDEW Middle Voltage Directive for Renewable Energy (wind)
新能源 (风能) 德国中电压指令
- Power Quality Measurement and Assessment
电能质量测试与评估
- Grid-connection Test Service
并网测试服务





Offshore Wind Turbine Service 海上风电服务

- Type and Project Certification
型式及项目认证
- Support for BSH Releases
(Federal Maritime and Hydrographic Agency)
BSH的支持（联邦海事水文局）
- Manufacturing Inspections
制造评估
- Quality Assurance
(eg. Inspection for Support Structure, Sub-station, etc.)
质量保证（如支撑结构检查，海上升压站检查等）
- Periodical or Condition Based Inspections
周期性或条件性的检验
- Component Approval
部件的认证评估
- Corrosion Protection
防腐保护
- Risk Assessments
风险评估
- HSE
健康、安全及环境
- Assistance in Project Development
海上项目开发支持
- Tailored Services on Request
基于需求的定制化服务
- Commissioning WTG
海上风机试运行



Siemens Gamesa SG 11.0-200 DD Offshore Wind Turbine

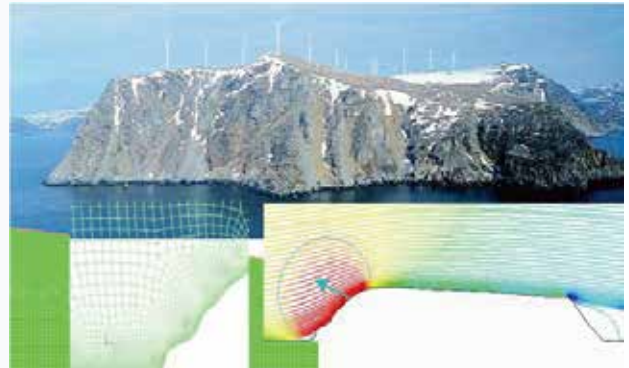
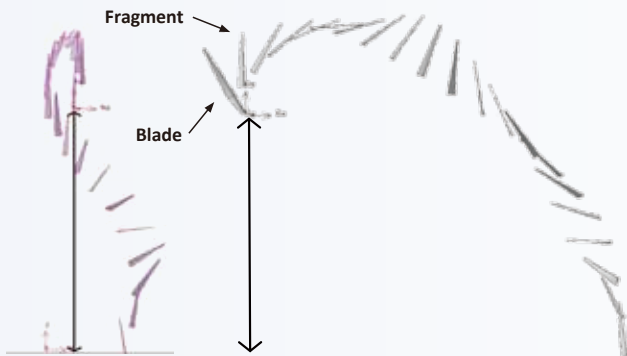


LM 107 P Rotor Blade



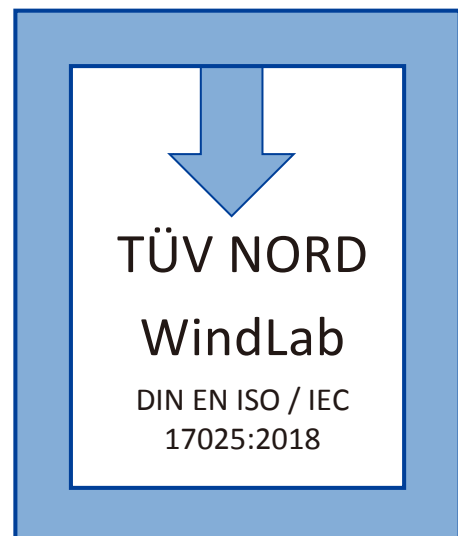
Group-Service Wind Farm Site Related Assessment

打包式服务—风场场地相关评估



Main Services 主要服务

- Assessments of Wind Resources / Wind Potential Maps / Energy Yield Prognosis
风资源评估 / 潜在风况图 / 产能预估
- Turbulence Reports
湍流报告
- Environmental Impact Studies Report
环境影响研究报告
- Sound Emission Prognoses / Shadow Flicker
声音传播预估 / 塔影闪变
- Soil Assessments, Foundation Assessment, Building Surveillance
土壤评估 / 基础评估 / 建筑监造
- Due Diligences
尽职调查
- 3-D flow Calculations (CFD)
3-D流体计算
- Risk Analysis (Ice Shedding, Blade Fragment Trajectories, Structural Failure of Tower, Tire. etc.)
风险分析 (叶片摔冰、叶片破损轨迹、塔筒结构失效、火灾等)
- Periodic Inspections
周期性检查



Due Diligence

尽职调查



Possible Aspects of a Due Diligence

尽职调查相关方面

01. Assessment of Plausibility of the Energy Yields (AEP) and Wind Potential Prognosis or Study
年产能及风况预报或研究的可行性评估
02. Plausibility Check of Calculated Annual Energy Production (AEP)
计算年产能的可行性检查
03. Assessment of Plausibility of the Certification Documents of the Chosen Wind Turbine Type
被选风机类型认证文档的可行性评估
04. Evaluation of Technical Risks of the Turbine Concept and Technology
风机概念及工艺的技术性风险评价
05. Evaluation of Technical Risks of the Foundation Construction
基础建设的技术性风险评价
06. Assessment of Plausibility of the Maintenance and Service Concept
维护和服务概念的可行性评估
07. Review of the Interface Management
接口管理审核
08. Assessment of Plausibility of the Soil Assessment Reports
土壤评估报告的可行性评估
09. Contract Assessment on Extend and Completeness
延展性及完整性相关的合同评估
10. Contract Assessment on Legal Content
法务相关内容的合同评估
11. Assessment Report with Findings and Recommendations
问题发现及推荐的评估报告
12. Profitability Analyses on the Base of the Profit and Loss Account and the Investment Sum Review of the Risks of the Insurance Concept
基于利润及亏损账户及投资总和的盈利性分析



Economy Efficiency 经济效益

Investments 投资

- Costs per Turbine 风机成本
- Costs for Installation 安装成本
- Costs for Foundation 基础成本
- Grid Connection 并网
- Access Roads, Crane Site 道路吊装条件
- Costs for Transformer and Cabeling 变压器及线缆成本
- Project Development, Site Management 项目开发，现场管理

Financing 金融

- Dept 部门
- Equity 公正
- Num. of Dept Investors 投资部门数量
- Dept Conditions 部门条件

Operational Costs 运营成本

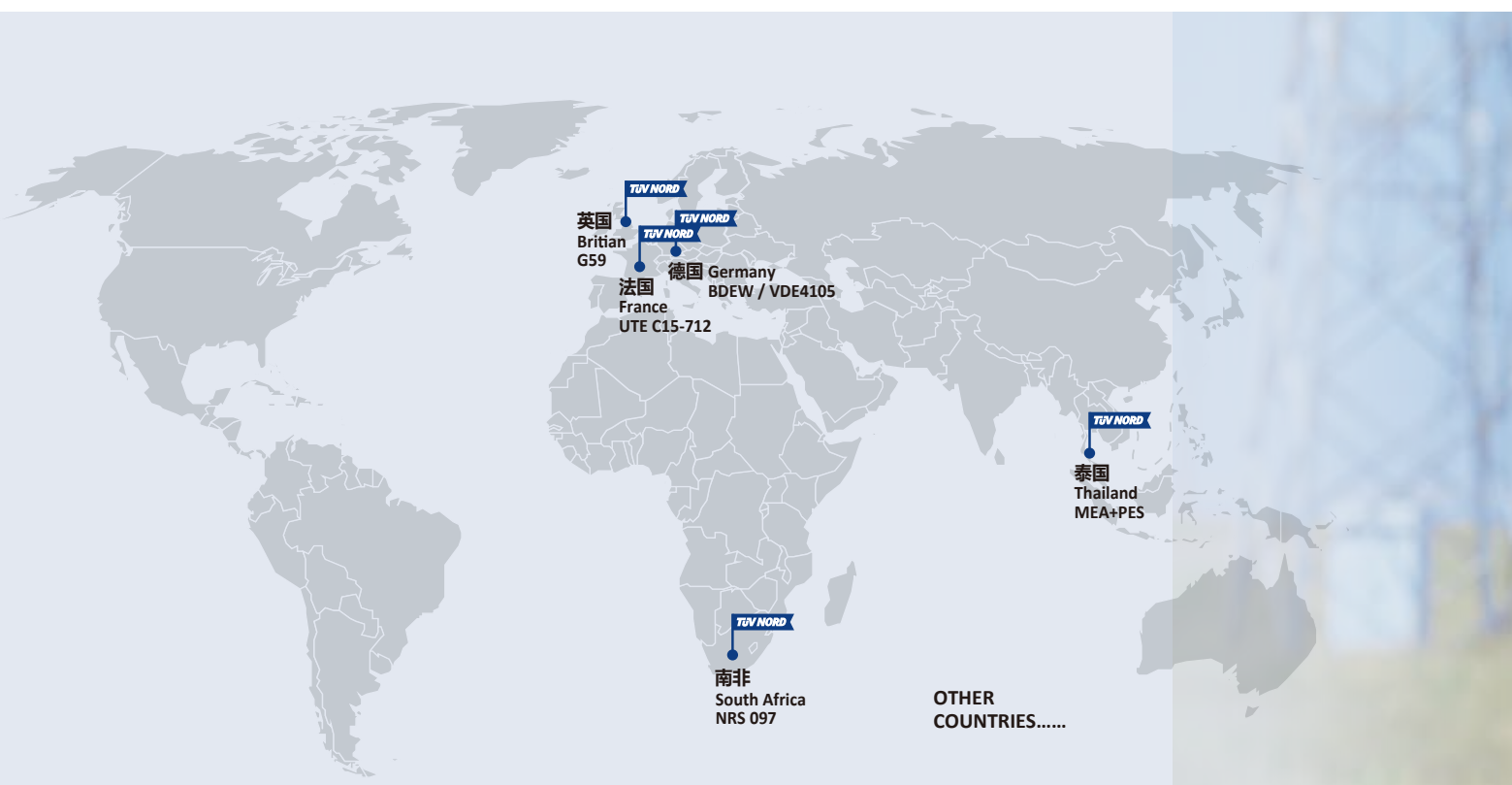
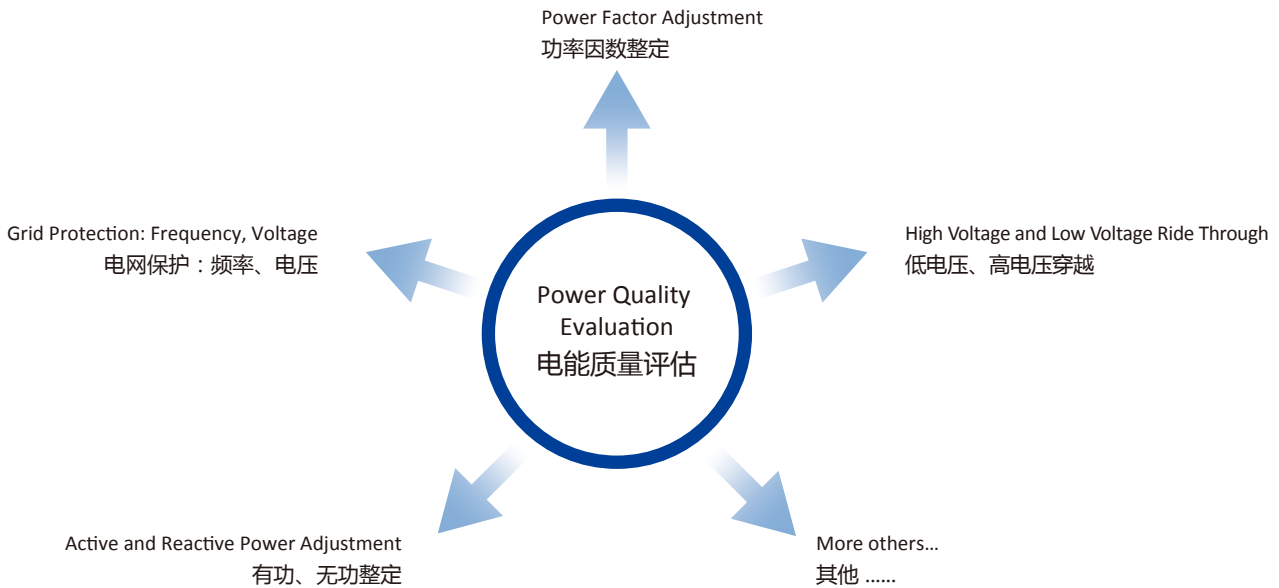
- Insurance 保险
- Operation Management 运行管理
- Maintenance Service 维护服务
- Land Lease 土地租赁
- Repairs 维修
- Fees for Technical Inspections 技术检查费用

Earnings 盈利

- Energy Yield Brutto acc. to Prognosis 产能与预估的对比
- Feed-in Tariff 补贴政策
- Availability 可利用率
- Safety Margin 安全裕量
- Annual Energy Production Netto 最低年产能

Wind Energy and Power Distribution Related Service 风能与配电网相关服务

Power Quality Evaluation and Multi-National Grid Code Compliance Service 电能质量评估及多国并网法规要求服务

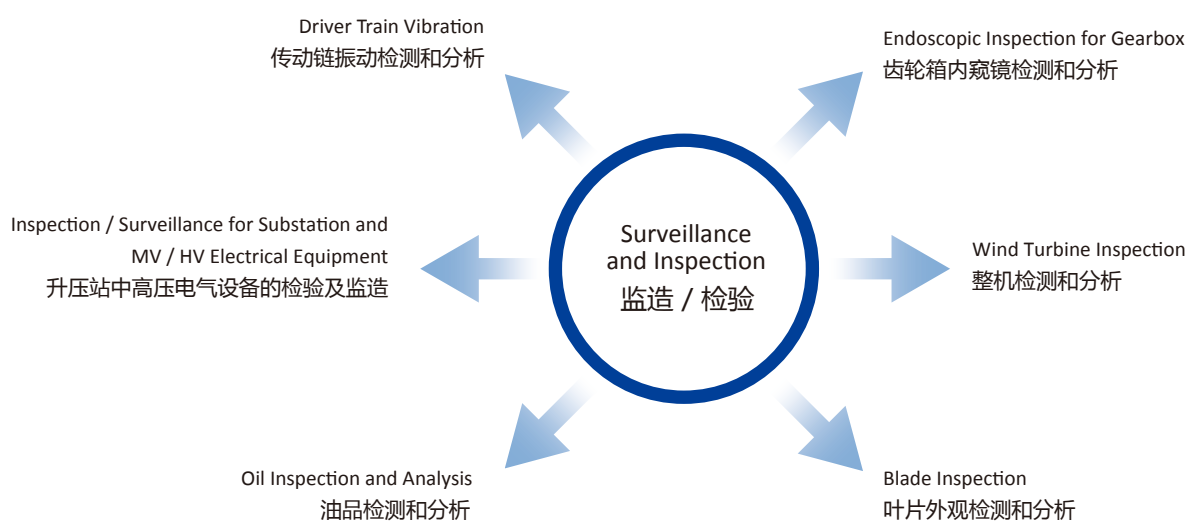


Wind Energy and Power Distribution Related Service

风能与配电网相关服务

Surveillance and Inspection Service

监造及检验服务



Wind Farm Smart Operations Center Service Solution

风场智能运行中心服务解决方案

Operation Control Center
运行控制中心

Wind Farm Smart-grid Service
风场智能电网服务

Supervisory Control and Data Acquisition Related Service
SCADA相关服务

Wind Farm Asset Management Service
智慧风场服务



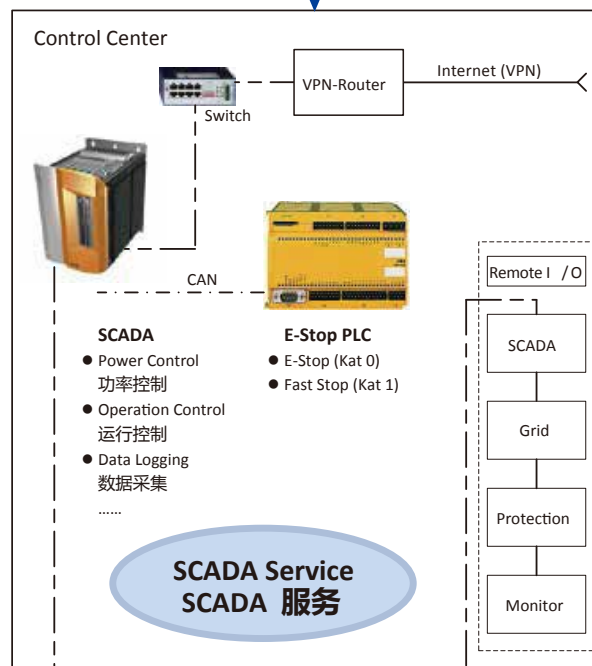
Smart Wind Farm 智慧风场

- Wind Farm Smart Operation
风场的智能化运行
- Efficiency Analyze
效率分析
- TBA / PBA Analyze
可利用率的分析
- CMS Service
CMS服务
-



Smart Grid 智能电网

- Smart Dispatch
智能调度
- Smart Protection
智能保护
- Energy Storage System
储能系统
-



HMI Screen 显示界面
(in operator room 控制室)



Smart Services Grid Related Projects

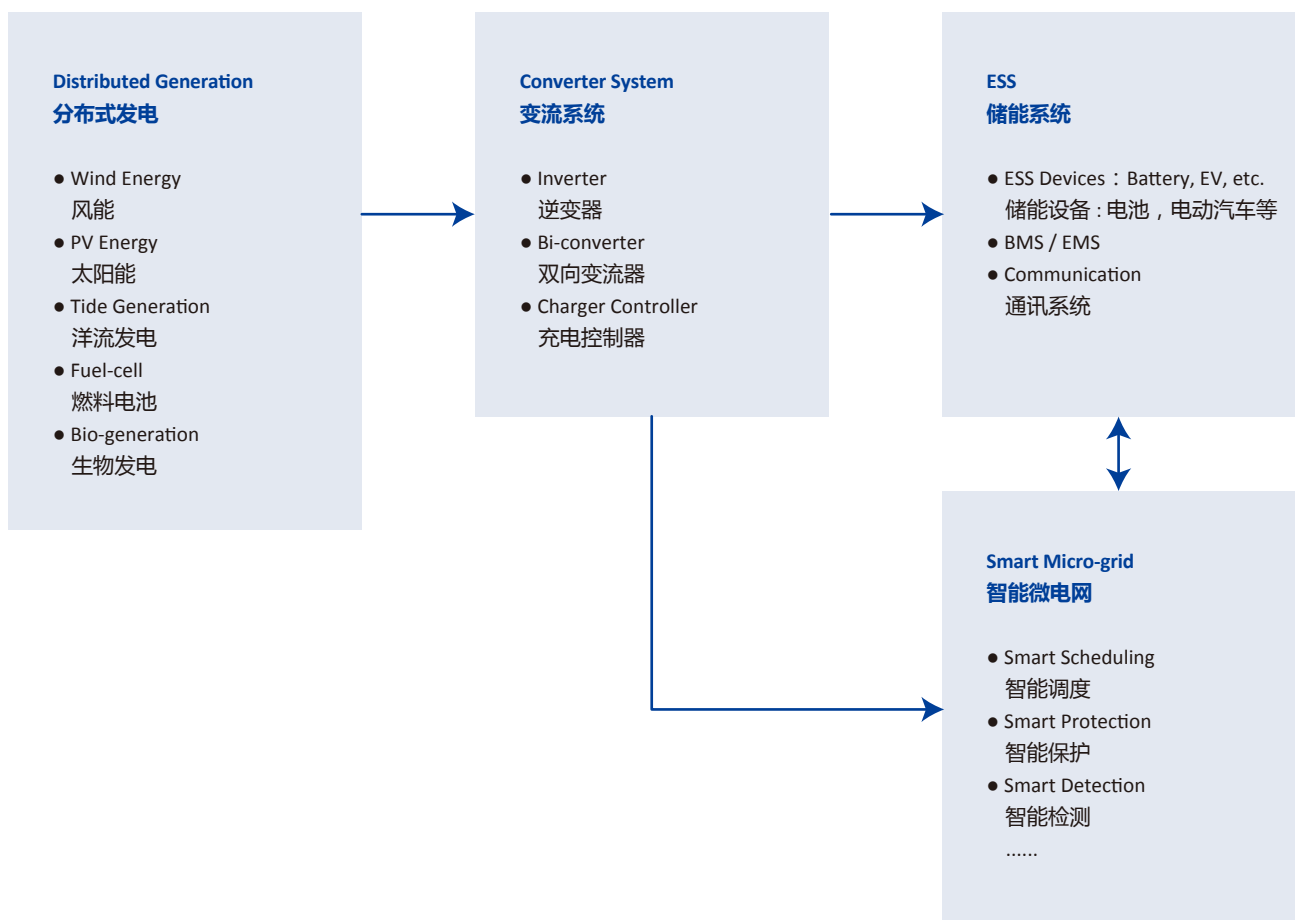
电网相关项目的智能化服务

Micro-grid and Distributed Generation Service Solution

微网及分布式发电服务解决方案

Energy Storage System Service Solution

储能系统服务解决方案





For more information, please contact us!

欲知更多，敬请联系我们！

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