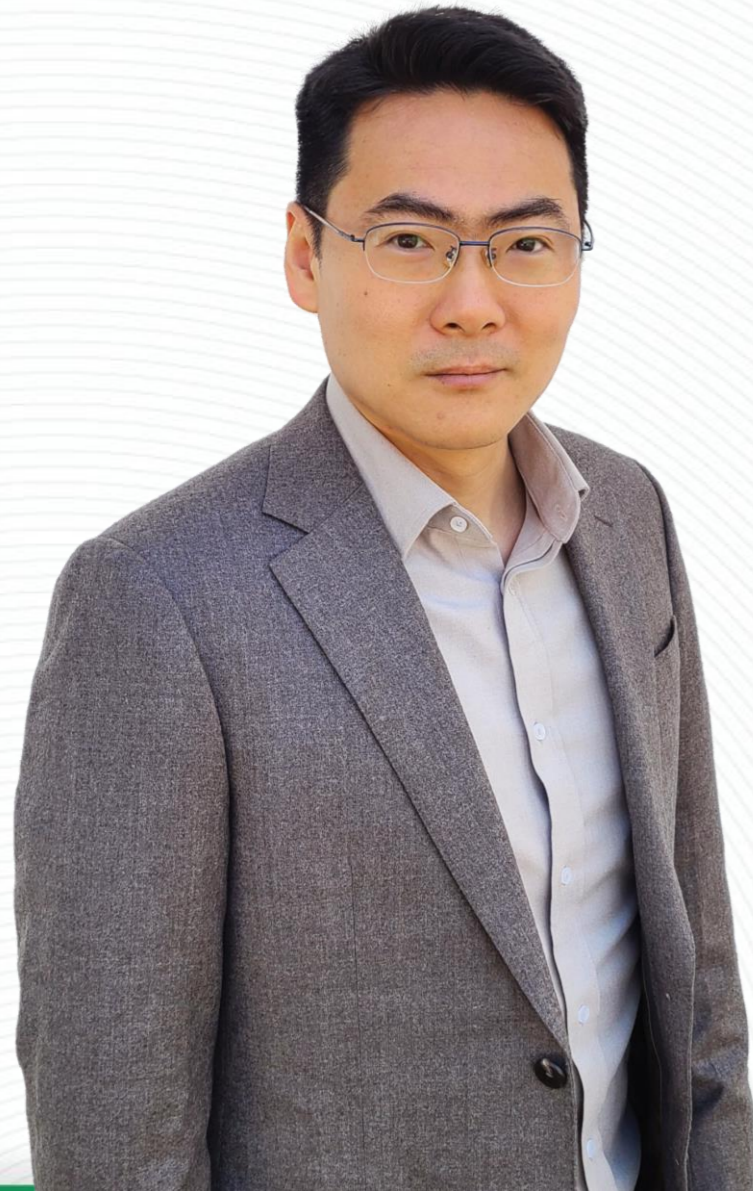


Innovationen und aktuelle Entwicklungen für die Zertifizierung von Windenergieanlagen in der IECRE
Innovations and Developments for the certification of wind turbines within IECRE

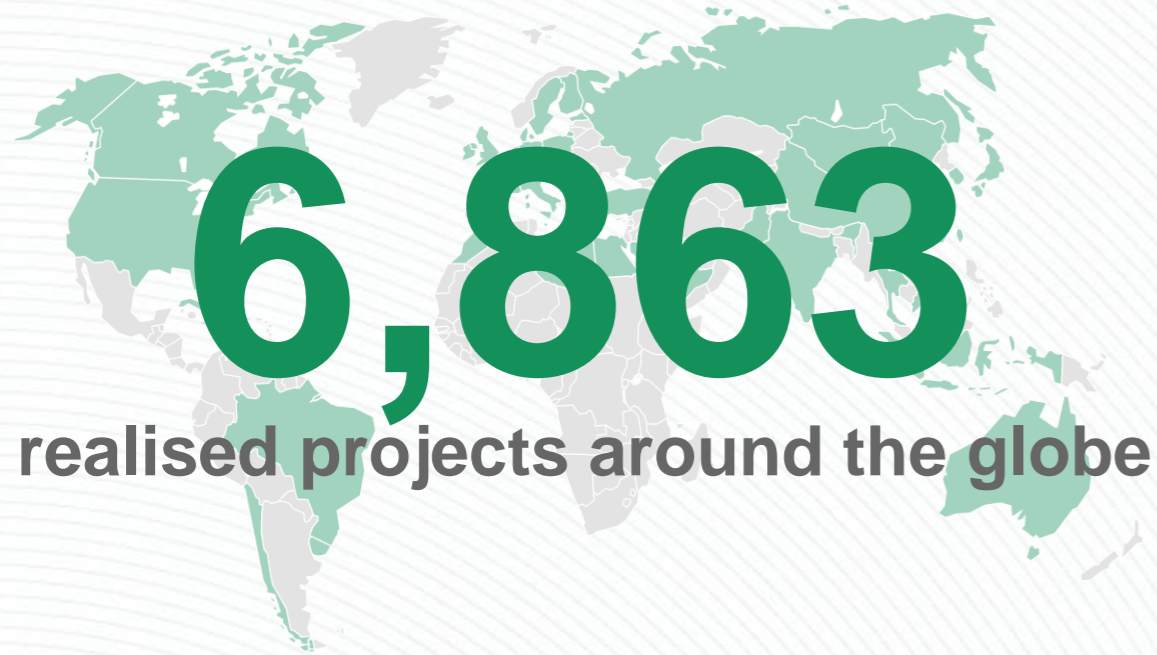
Yutong Huang, windtest grevenbroich gmbh

Yutong Huang



- Dipl.-Ing. Engineering Mechanics
Beijing University of Technology
- IECRE
Assessor for Power Performance and Mechanical Loads
deputy convener of SG551
- Since 2023
Principal Engineer windtest grevenbroich
CTO windtest north-america
- 2012 – 2022
Deputy Head of RE Test Department CGC
(China General Certification Center)
Power Performance, Loads, Software Development
- Other
Participation TC88 IEC working groups
International cooperation work
- Contact
+49 151-171-324-44
yutong.huang@windtest-nrw.de

At a glance



25 Years
Experience

Approved quality

- ✓ DAkkS ISO/IEC 17025
- ✓ MEASNET
- ✓ IECRE



Subsidiary
in the
USA
since
2014



3

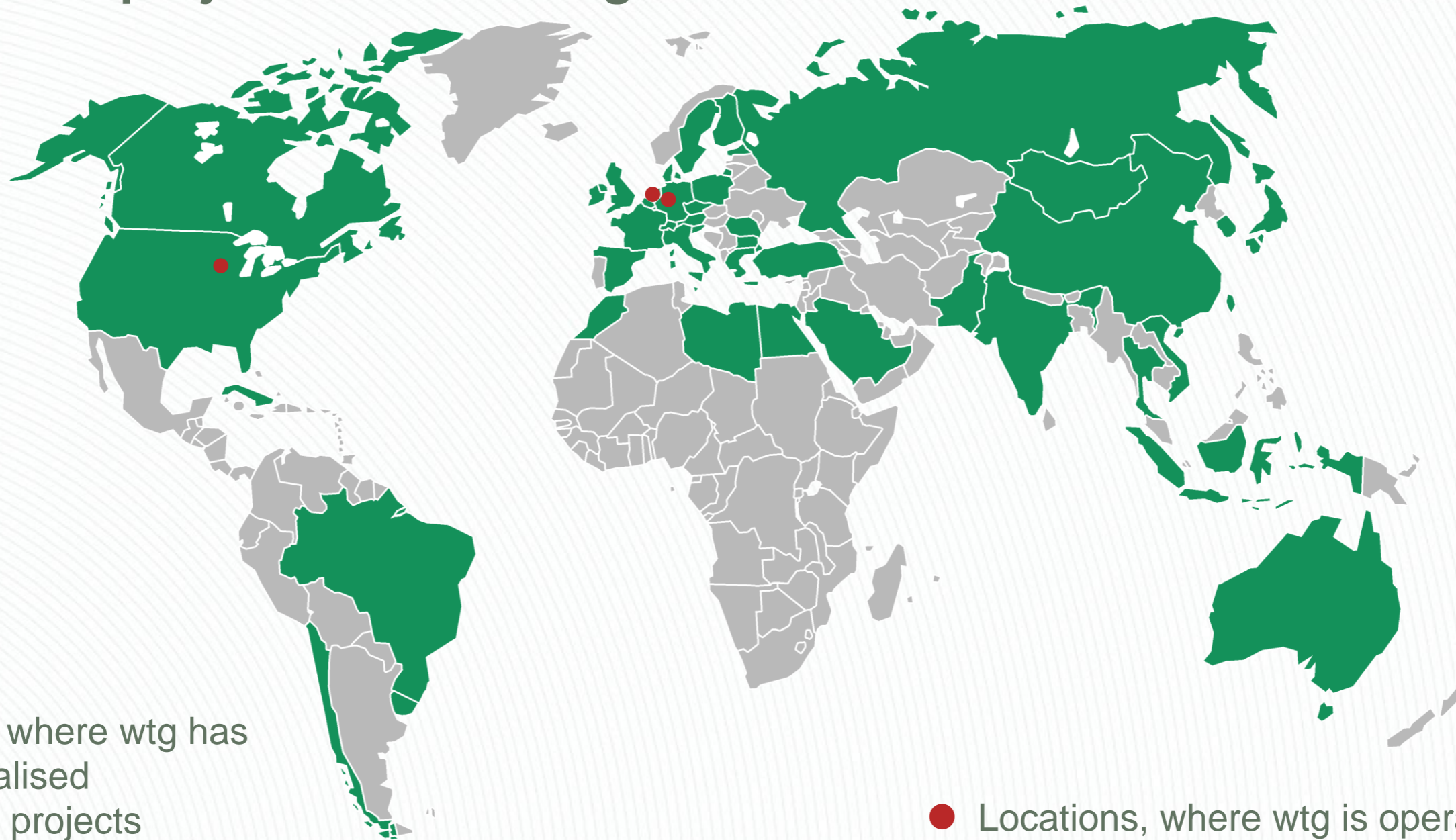
Test sites

Grevenbroich (GER)
Lelystad (NLD)
Iowa (USA)



International experience

6,863 realised projects around the globe



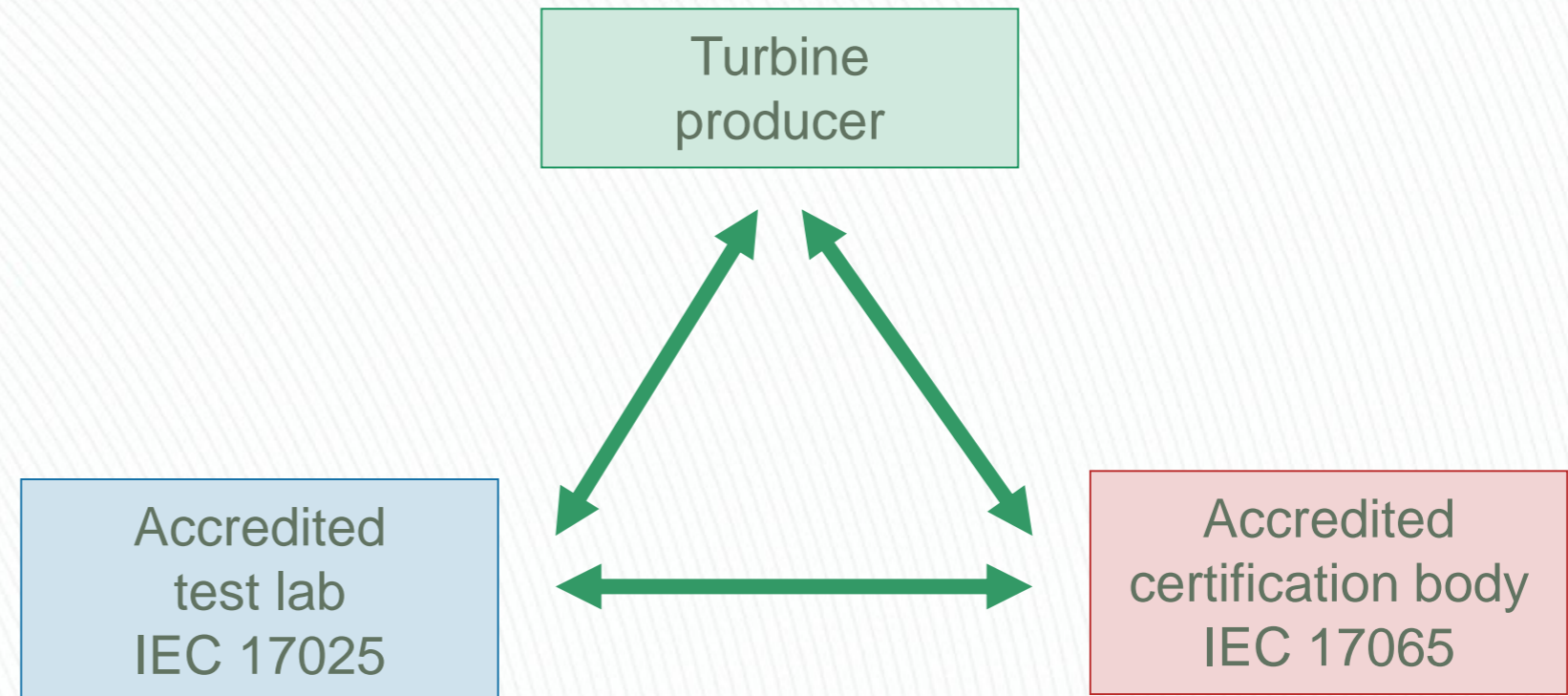
■ Countries, where wtg has already realised successful projects

● Locations, where wtg is operating test sites
Lidar verification site in Grevenbroich

IECRE

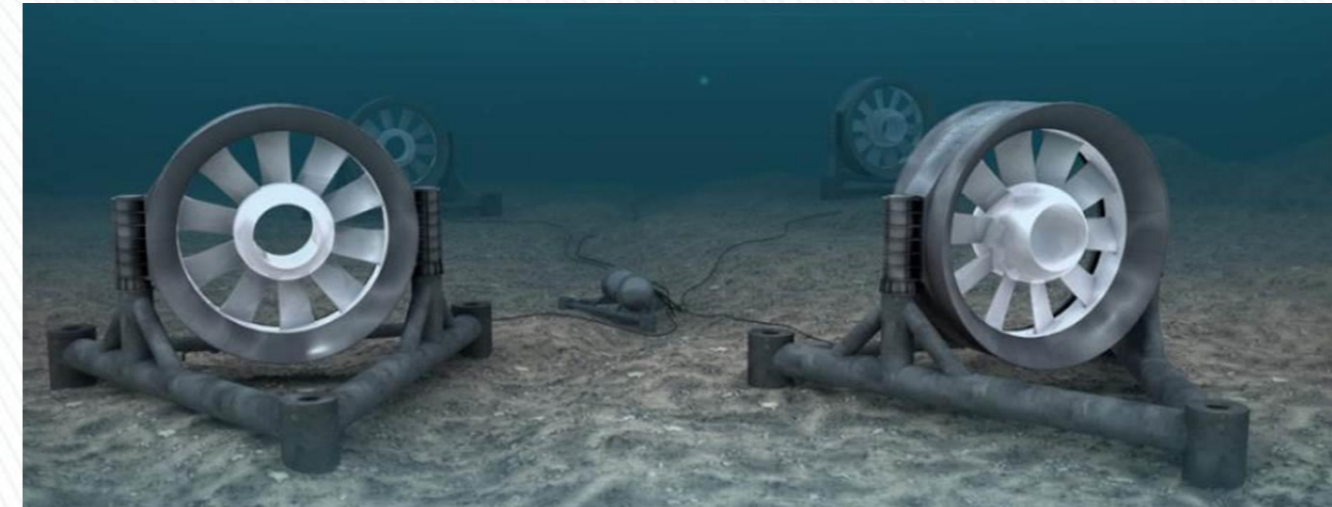
Certification in good old times

- Accreditation varies in procedures
- Accreditation varies in quality
- Assessments vary in quality
- **Value of certificates ?**
- **End user ?**
- Equal influence ?



IECRE

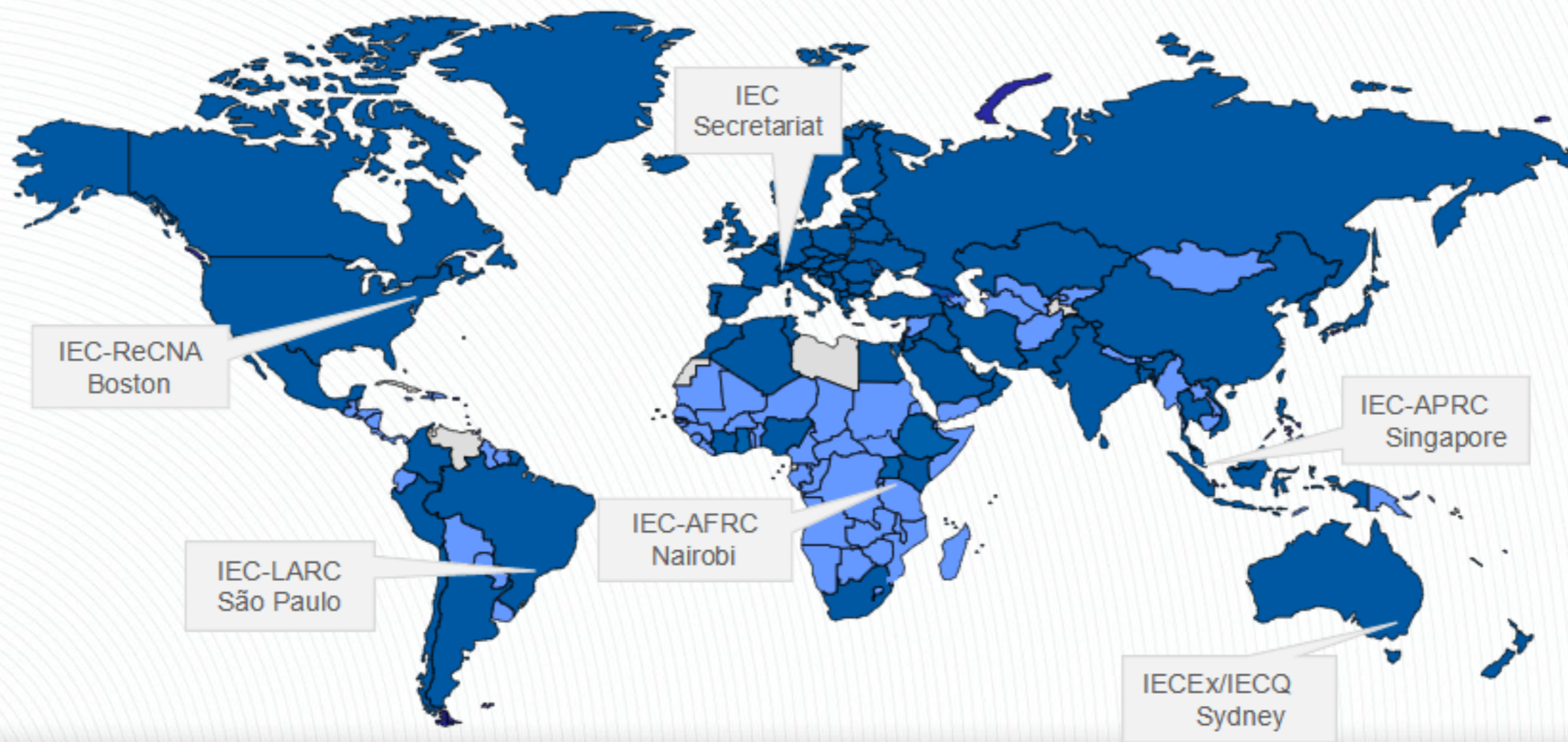
Sectors: wind, PV, marine energy



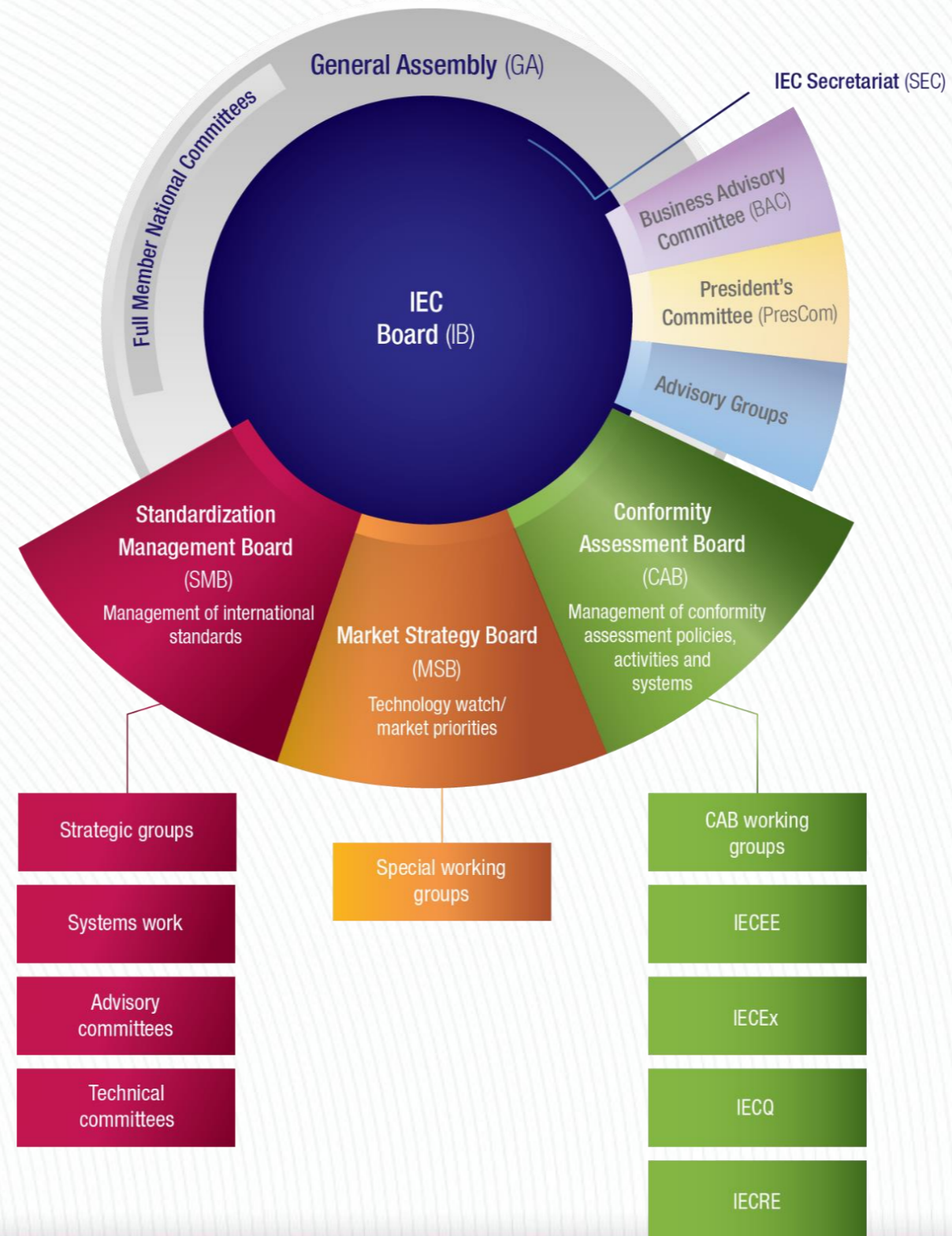
- 2012: Launch
- 2015: Start of operation
- 2023: 480 Certificates
 - Vestas Siemens Gamesa
 - GE Enercon Envision
 - Goldwind Suzlon
 - LM

IEC family

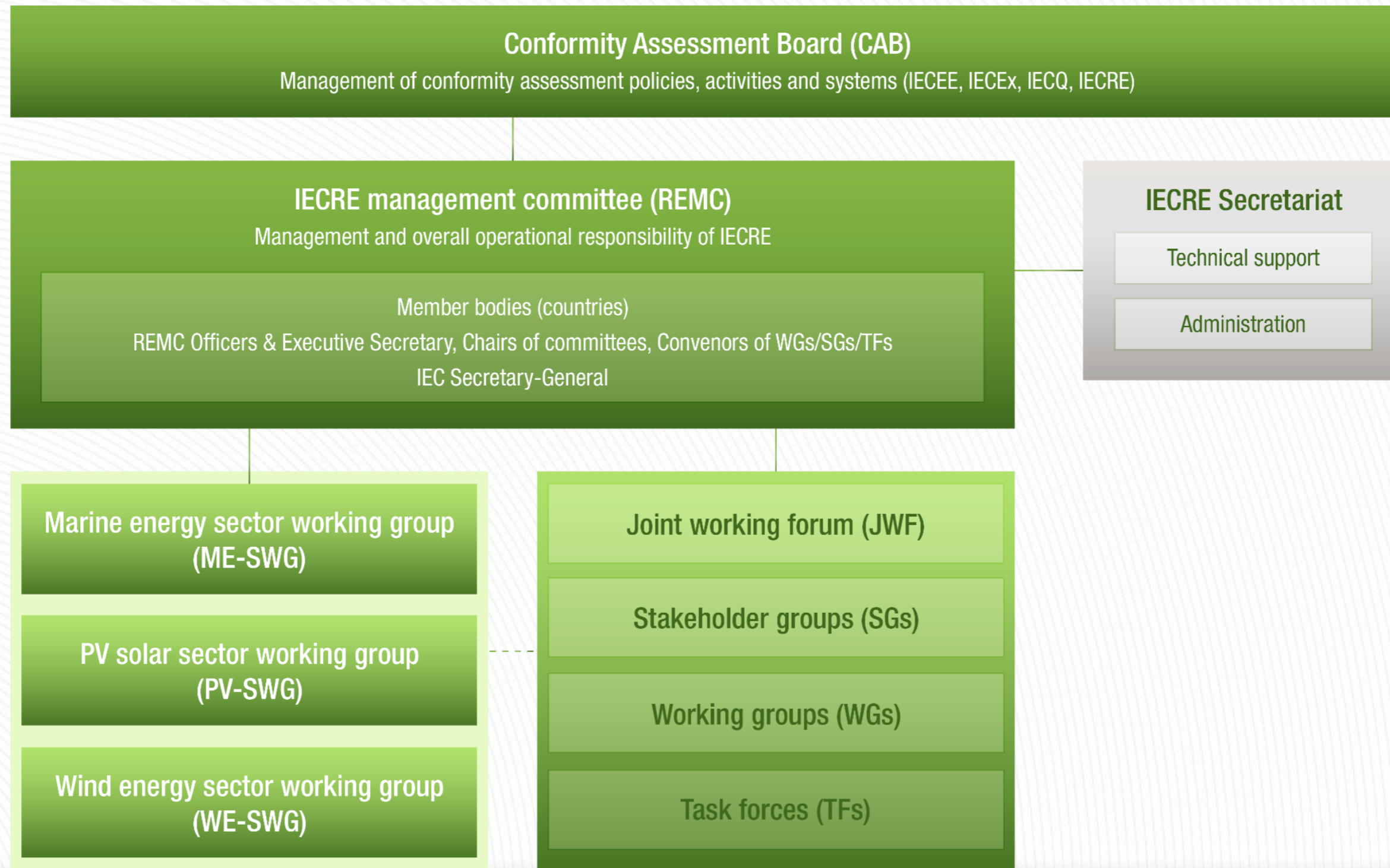
Global reach: 174 countries (88 members – 86 affiliates)



IEC Management Structure



IECRE Management Structure



IECRE Management Structure



IECRE 16 National Membership Countries

As per IEC CA 01, basic rules, countries listed as voting Members are identified with the "star" icon.












Countries listed as non-voting Members are identified with the "eye" icon.

Country	Name	Voting member	Marine energy	Solar energy	Wind energy
Australia	Joint Accreditation System of Australia and New Zealand (JAS-ANZ)	★		1	
Belgium	CEB-BEC	★	1		
China	Certification and Accreditation Administration of the People's Republic of China (CNCA)	★		1	1
Denmark	IEC National Committee of Denmark	★			1
France	LCIE by Delegation from the IEC NATIONAL COMMITTEE of FRANCE	★	1		1
Germany	IEC National Committee of Germany	★		1	1
India	Bureau of Indian Standards	★		1	1
Italy	CEI - Comitato Elettrotecnico Italiano	★	1	1	1
Japan	IEC National Committee of Japan	★	1	1	1
Korea, Republic of	IEC National Committee of Korea, Republic of	★		1	1
Netherlands	IEC National Committee of Netherlands	★			1
Saudi Arabia	SASO (Saudi Standards, Metrology and Quality Org.)	★		1	1
Spain	IEC National Committee of Spain	★		1	1
United Arab Emirates	Ministry of Industry and Advanced Technology (MoIAT)	★		1	
United Kingdom	UK Committee for IECRE	★	1		1
United States of America	USNC/IECRE	★	1	1	1

Showing 1 to 16 (Total 16 entries)

IECRE

11 Certification Bodies

Country	Name	Marine energy	Solar energy	Wind energy
 China	China General Certification Center (CGC)		1	1
 China	China Quality Certification Centre		1	1
 China	China Classification Society Certification Co., Ltd. (CCSC)			1
 France	Bureau Veritas Certification France			1
 Germany	UL Solutions			1
 Germany	WindGuard Certification GmbH			1
 Germany	TÜV SÜD Industrie Service GmbH			1
 Germany	TÜV NORD CERT GmbH			1
 Germany	DNV Renewables Certification			1
 Germany	TÜV Rheinland Industrie Service GmbH			1
 United Kingdom	Lloyd's Register Marine Limited	1		1

Showing 1 to 11 (Total 11 entries)

36 Test Labs & Customer Test Facilities

Test Labs

Country	Name
China	CEPRI – China Electric Power Research Institute
China	National Wind Energy Testing & Certification (Tianjin)Co., Ltd.
China	SERCAL- Shanghai SERCAL New Energy Technology Co Ltd
China	China Classification Society Certification Co., Ltd. (CCSC)
China	Beijing CGC Certification Center Co., Ltd.
Denmark	"Wind Turbine Test", Test and Calibration (TAC), DTU Wind and Energy Systems, Technical University of Denmark
Denmark	Svend Ole Hansen ApS
Denmark	COWI A/S
Denmark	Blaest A/S
Denmark	SWECO Danmark A/S
Denmark	LM Wind Power A/S
Germany	WIND-consult Ingenieurgesellschaft für umweltschonende Energiewandlung mbH
Germany	Windtest Grevenbroich GmbH
Germany	Moeller Operating Engineering GmbH
Germany	Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V.
Germany	Deutsche WindGuard Consulting GmbH
Germany	Deutsche WindGuard Wind Tunnel Services GmbH
Germany	UL Solutions

Korea, Republic of	Korea Institute of Materials Science (KIMS - WTRC)
Netherlands	TNO Energy Transition
Spain	Universidad Politécnica de Madrid Instituto Universitario de Microgravedad "Ignacio Da Riva", IDR/UPM
Spain	ENERGY TO QUALITY S.L (BARLOVENTO)
Spain	Aresse Engineering S.L.
Spain	Fundación CENER-CIEMAT (CENER)
Spain	Barlovento Recursos Naturales S.L.
Spain	GL Garrad Hassan Iberica SL
United Kingdom	Wood (Clean Energy)
United Kingdom	Offshore Renewable Energy Catapult
United Kingdom	European Marine Energy Centre
United States of America	DNV Energy USA, Inc.
United States of America	Massachusetts Clean Energy Center WTTC
United States of America	ArcVera Renewables

Customer Test Facilities

Country	Name
Denmark	Siemens Gamesa Renewable Energy A/S – Blade Test center
Germany	WRD Wobben Research and Development GmbH
United Kingdom	Vestas Technology UK Ltd

IECRE

RETL and RECTF distribution

China	5
Denmark	7
Germany	8
Republic of Korea	1
Netherlands	1
Spain	6
United Kingdom	4
United States of America	3

IECRE

Enduser

- AIG
- Innogy / RWE / EON
- Vattenfall
- EnBW
- Dong / Oerstedt
- Beijing TianRun New Energy Investment
- EDF
- Next Aera
- Danish Energy Association
- ...

IECRE

Competence Areas for Test Labs & Customer Test Facilities

Established

- Power curve
- Mechanical loads
- Power quality
- Acoustic noise

- Anemometer calibration

- Blade testing
- Gearbox Testing

Upcoming

- Site suitability
- Through life management
- Model validation
- Cyber security
- ...

IECRE

Competence Areas for Certifiers

Established

- Type Certificates
- Project Certificates
- Component Certificates

Discussed

- Type Certificates
 - Blades
 - Tower
 - Loads
 - Electrical
 - ...

IECRE

Industry benefits

- International and consensus based
 - Well international representation
 - Well industrial representation
- Standardization
 - IECRE certificates and reports guarantee the consistency with IEC standards
 - Only IECRE approved certification bodies and test labs can issue IECRE certificates and test reports
 - Uniform certificate template
- Transparency
 - Online certificate and report database



IECRE

Industry benefits

- **Equal influence** of stake holder groups
 - **Certifiers** (Bente Vestergaard, DNVGL)
 - **Test labs** (Eric Effern, windtest grevenbroich)
 - **OEMs** (Toby Gillespie, GE)
 - **End users** (Belén Fernández Montes, Vattenfall)
 - **Small wind** (Hagen Ruff, Chava)
- **Principle of consent**
- **Consistent assessments** for certifiers & test labs
- **Peer assessment**
- **Consistent proficiency testing**
- **Clarification sheets**
- **Standardised certificate layouts**

IECRE

Possibilities of Influence in IECRE Wind Sector

- Join one of 4 **stake holder** group
 - certifiers, test labs, OEMs, end users, small wind
 - at least 1 meeting per year
 - direct representation in WE-OMC meetings
 - 1 year observer
- Join **working groups**
 - Create operational documents
 - Several meetings per year
 - **e.g. WG 010**
- Attend **national representation** committees (DKE TBKON.IECRE.CMC)
 - Decide on MB requests to WE-SWG
 - Influence MB decisions, votes
- Attend **WE-SWG meetings**
 - 1 meeting per year
 - Delegation member or observer
- Attend **REMC meetings**
 - 1 meeting per year
 - Delegation member or observer

IECRE

RETL and RECTF Acceptance Process

- Peer assessment
 - technical assessors with up to date detailed know how
 - lead assessor for system assessments
 - lead assessor moderating the process
 - in detail report check
 - site installation check
- Consistent proficiency testing
 - PTs for all competence areas
 - PT conditions decided by all stakeholders
 - 1.5 year rhythm
 - feedback loop into TC88

IECRE

Industry benefits

- Easy to find qualified organizations and their scopes:
 - RECBs: <https://www.iecre.org/members/certification-bodies-recbs>
 - RETLs: <https://www.iecre.org/members/testing-laboratories-retls>
 - RECTFs: <https://www.iecre.org/members/customer-test-facilities-rectfs>

RE Testing Laboratory

Windtest Grevenbroich GmbH

Detail Scope

Show 25 entries

Search here... Download List

Reference	Sector	Deliverable	Acceptance date
IEC 61400-11:2012	Wind Energy	Acoustic Testing	2020-06-08
IEC 61400-11:2012/AMD1:2018	Wind Energy	Acoustic Testing	2020-06-08
IEC 61400-12-1:2005 Except Annex F	Wind Energy	Power Curve Testing	2017-07-10
IEC 61400-12-1:2017 Except Annex F	Wind Energy	Power Curve Testing	2020-01-07
IEC 61400-13:2015	Wind Energy	Loads Testing	2021-01-08
IEC 61400-21-1:2019	Wind Energy		2022-08-19
IEC 61400-21:2008	Wind Energy	Electrical Characteristics Testing	2020-06-08
IEC TS 61400-13:2001	Wind Energy	Loads Testing	2017-07-10

Showing 1 to 8 (Total 8 entries)



Certificate of Acceptance

To participate
in the IECRE – IEC System for Certification to Standards relating to Equipment for use In Renewable Energy Applications

Windtest Grevenbroich GmbH
Frimmersdorfer Straße, 73a, D-41517 Grevenbroich

has been assessed and determined to fully comply with the requirements of ISO/IEC 17025: 2005, The Rules and Procedures of the IECRE System.

Windtest Grevenbroich GmbH

is therefore entitled to operate as a German Testing Laboratory within the IECRE the Scope and Standard(s) as listed in the relevant part of the IECRE Web Site at www.iecre.org, and is subject to all other terms as set forth in the IECRE Basic Rules and Rules of Procedure.

The IECRE membership status of this RETL can be verified on the aforementioned site.

Geneva, Switzerland, February 2022



Wolfram Zeitz
IECRE Executive Secretary

IECRE

Industry benefits

■ Transparent certificate and report database: <https://certificates.iecre.org/#/home>

IECRE - Renewable Energy
IEC system for certification to standards relating to equipment for use in renewable energy applications

Home Search Search by ref #

Valid certificates only Expired certificates only

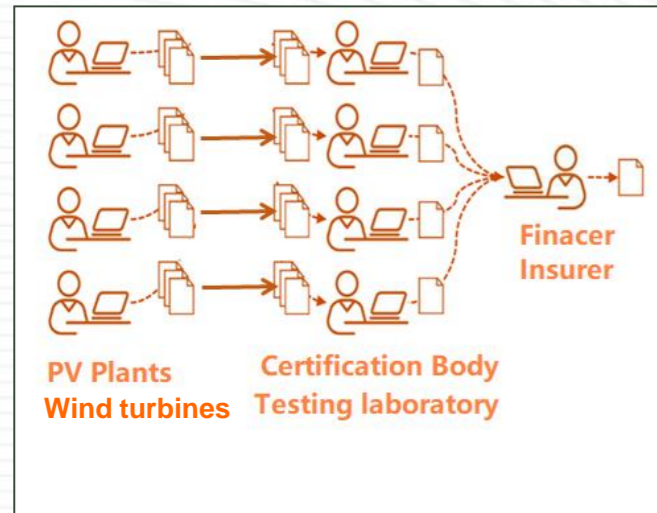
Search 980 result(s) found Recently viewed

STATUS	CERTIFICATE NUMBER	TYPE	WIND TURBINE/MODEL	TECHNOLOGY	TURBINE CLASS	ISSUE DATE ↓	VALID UNTIL	STANDARD/OD	ISSUED TO	ISSUING ORG
VALID	IECRE.WE.CS.23.0148-R0	CS	Bolts M36-10.9 acc. specification	Wind Turbine Component	unspecific Unspecified	2023-06-16			Sinoma Wind Power Blade Co. Ltd.	TÜV NORD CERT GmbH
VALID	IECRE.WE.TC.23.0137-R0	TC	N133/4.8	Wind Turbine	N133/4.8 S	2023-06-09	2024-06-08	IEC 61400-1:2005/AMD1:2010 OD-501 Ed 2	Nordex Energy SE & Co.KG	TÜV SÜD Industrie Service GmbH
VALID	IECRE.WE.CC.23.0150-R0	CC	Wind Turbine Gearbox ZF EH1052A-113	Wind Turbine	See details on next page S	2023-06-09	2028-06-09		ZF Wind Power Coimbatore Private Limited	DNV Renewables Certification
VALID	IECRE.WE.CS.23.0200-R0	CS	Wind Turbine Gearbox ZF EH1052A-113	Wind Turbine Component	See details on next page S	2023-06-09			ZF Wind Power Coimbatore Private Limited	DNV Renewables Certification
VALID	IECRE.WE.TC.23.0140-R0	TC	N163/5.X	Wind Turbine	N163/5.X S	2023-06-09	2028-06-08	IEC 61400-1:2005/AMD1:2010 OD-501 Ed 2	Nordex Energy SE & Co.KG	TÜV SÜD Industrie Service GmbH
VALID	IECRE.WE.TC.23.0139-R0	TC	N149/5.X	Wind Turbine	N149/5.X S	2023-06-09	2024-06-08	IEC 61400-1:2005/AMD1:2010 OD-501 Ed 2	Nordex Energy SE & Co.KG	TÜV SÜD Industrie Service GmbH
VALID	IECRE.WE.TC.23.0138-R0	TC	N149/4.0-4.5	Wind Turbine	N149/4.0-4.5 S	2023-06-09	2024-06-08	IEC 61400-1:2005/AMD1:2010 OD-501 Ed 2	Nordex Energy SE & Co.KG	TÜV SÜD Industrie Service GmbH
VALID	IECRE.WE.CC.22.0088-R5	CC	Wind Turbine Generator ENDF4.X-4	Wind Turbine	N/A Unspecified	2023-06-08	2026-02-16		Envision Energy Co., Ltd.	China General Certification Center (CGC)
VALID	IECRE.WE.CC.22.0081-R4	CC	Wind Turbine Gearbox WE7200Y	Wind Turbine	N/A Unspecified	2023-06-05	2027-03-28		Envision Energy Co., Ltd.	DNV Renewables Certification
VALID	IECRE.WE.CS.22.0107-R4	CS	Wind Turbine Gearbox WE7200Y	Wind Turbine Component	N/A Unspecified	2023-06-05			Envision Energy Co., Ltd.	DNV Renewables Certification

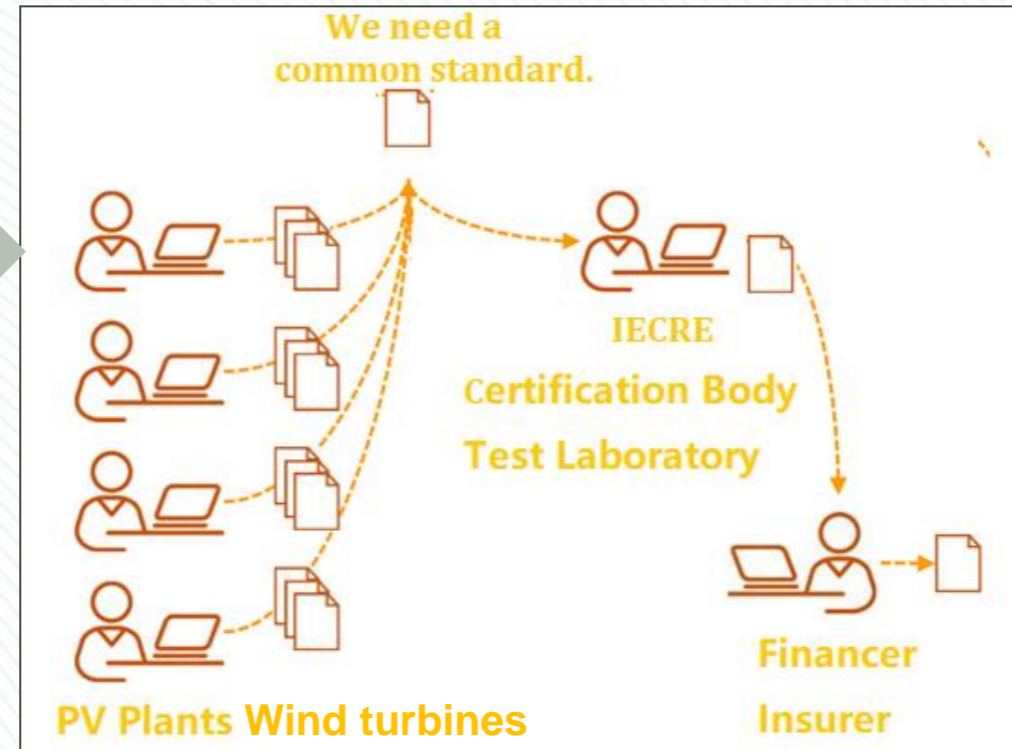
IECRE


Industry benefits

Then



Now





Certificate No.
IECRE.WE.TC.yy.000x-R0

(PROVISIONAL) TYPE CERTIFICATE

Wind Turbine

This certificate is issued to

for the wind turbine

wind turbine class (class, standard, year)

This certificate attests compliance with IEC 61400 Series as specified in subsequent pages. It is based on the following reference documents:

Design basis evaluation conformity statement Dated	DB-(Number) dd.mm.yy
Design evaluation conformity statement Dated	DE-(Number) dd.mm.yy
Type test conformity statement Dated	TT-(Number) dd.mm.yy
Manufacturing conformity statement Dated	MC-(Number) dd.mm.yy
Foundation design evaluation conformity statement Dated	FDE-(Number) dd.mm.yy
Foundation manufacturing evaluation conformity statement Dated	FDE-(Number) dd.mm.yy
Type characteristics conformity statement Dated	TCM-(Number) dd.mm.yy
Final evaluation report Dated	FER-(Number) dd.mm.yy

The conformity evaluation was carried out in accordance with the rules and procedures of the IECRE System
www.iecre.org

The wind turbine type specification begins on page 2 of this certificate.

Changes in the system design or the manufacturer's quality system are to be approved by the Certification Body. Without approval, the certificate loses its validity.

Street
City
Country

IIA, 61400-1:2005

Uniform template, globally

IECRE

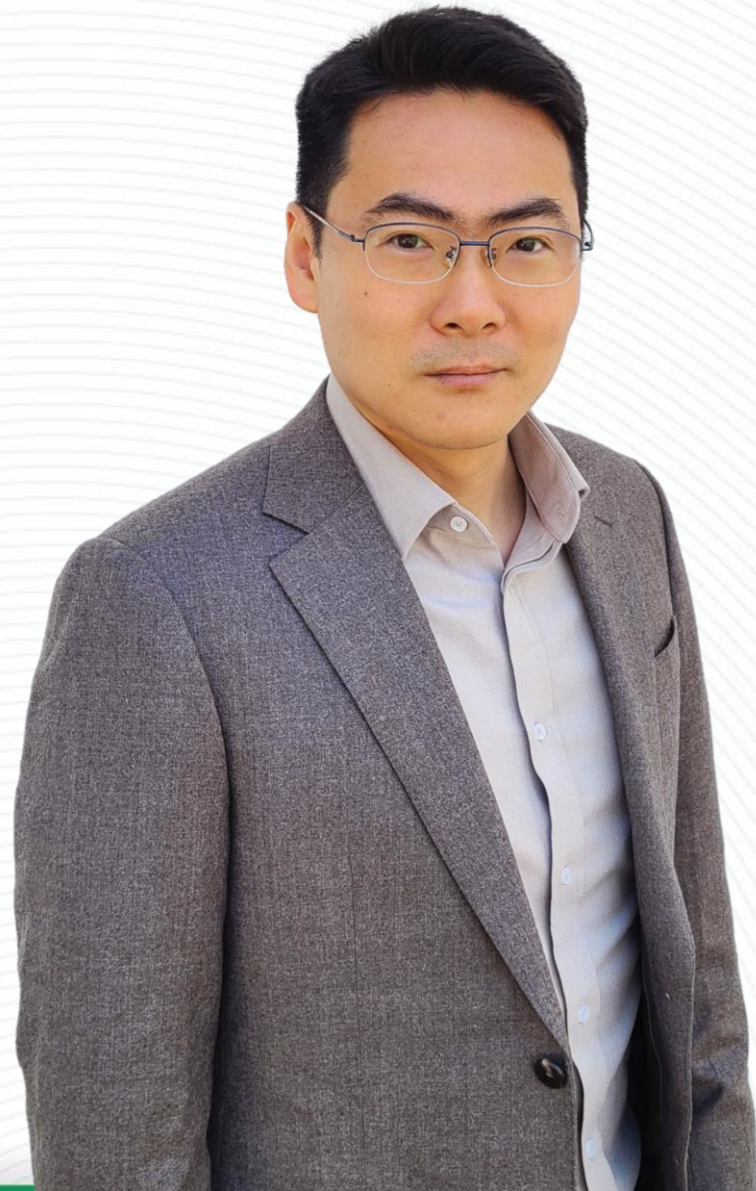
Upcoming meetings

IECRE Management Committee (REMC) meeting:
Fall, 2023, in the US (exact date TBD.)

Stakeholder Group End Users (SG553) meeting:
2023.8.15, online

Working Group 10 meeting is being planned

Any questions?



- **Dipl.-Ing. Yutong Huang**
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