

The Vestas logo is displayed in the top left corner of the image. It consists of the word "Vestas" in a bold, white, sans-serif font, with a registered trademark symbol (®) to its upper right. The background of the entire slide is a photograph of a wind turbine blade being worked on by a technician. The technician is wearing an orange helmet, safety glasses, and a dark shirt, and is lying on the blade. The blade is white and curved, and the background shows a clear blue sky and a flat landscape with other wind turbines in the distance.

Vestas®

Wind. It means the world to us.™

Service Strategy Presentation

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Agenda

Market Outlook

Vestas Today

Safety First

Vestas' Service Strategy

Vestas Training

AOM(Active Output Management)

Multibrand Services



Market Outlook - High growth rates in O&M spending

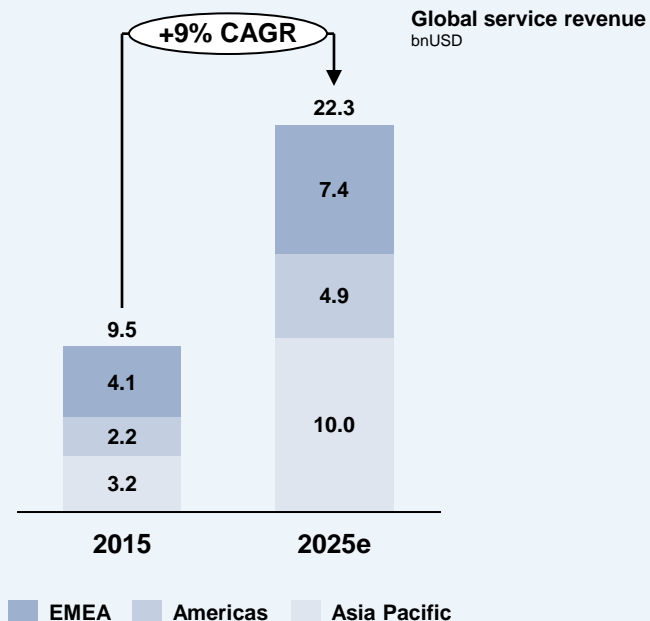
Global service market expected to grow by 9 percent annually towards 2025

Today, the global service fleet comprises more than 400GW
(Vestas: 18% market share)

By 2020, the global onshore wind base is forecasted to have
grown by 46% to 693GW

The market share of Wind and Solar in the global electricity
mix is forecasted to double by 2025

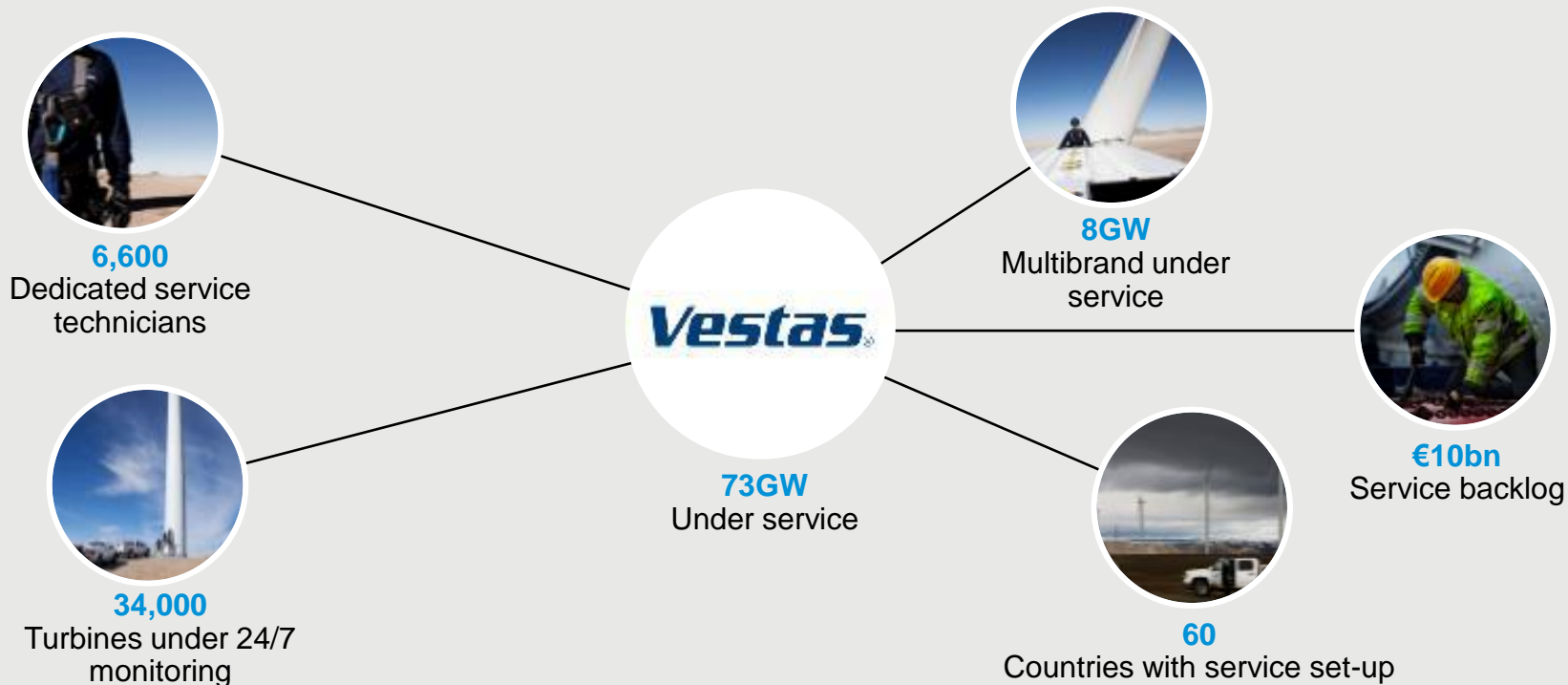
Service contract length for new turbines is increasing



Source: MAKE Consulting Global Wind Turbine O&M, November 2016

Vestas Today - The world's largest wind service provider

Long-term dedication to service and operations has put Vestas ahead



Business starts with safety

Safety is paramount in everything we do – safety comes first at Vestas

Safety a fundamental element of our business

- Unified approach to safety
- Global safety processes
- Safety introduction programmes

Incident management

- Vestas incident management system – global knowledge sharing

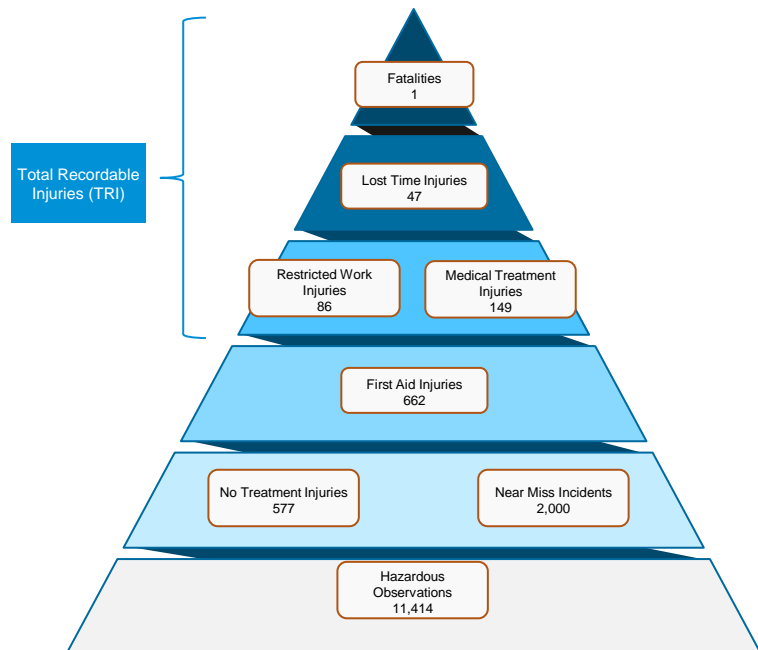
Contractor safety

- Pre-qualification and intensified tracking of safety performance
- Global Contractor Health and Safety Requirements



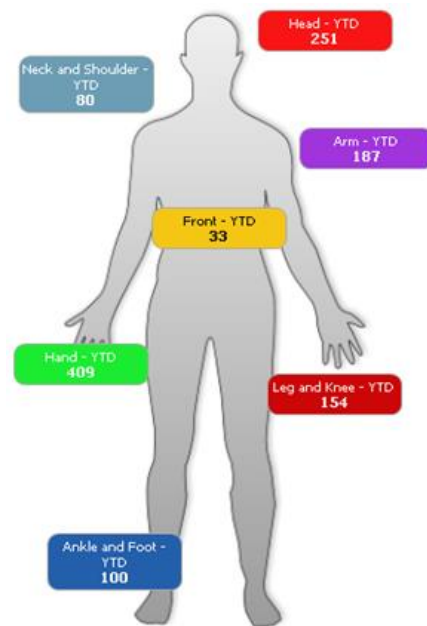
Detailed Injury Tracking

Injury distributions Nov. 2015 YTD



- In order for Vestas to proactively manage safety, detailed injury tracking is performed to learn from incidences. Big data enables new safety analysis possibilities and proactive safety management opportunities.

- In addition to Lost Time Injuries, the new measure TRI includes 'restricted work injuries' and 'medical treatment injuries', thereby providing more data points on unsafe behavior and the use of unsafe material.

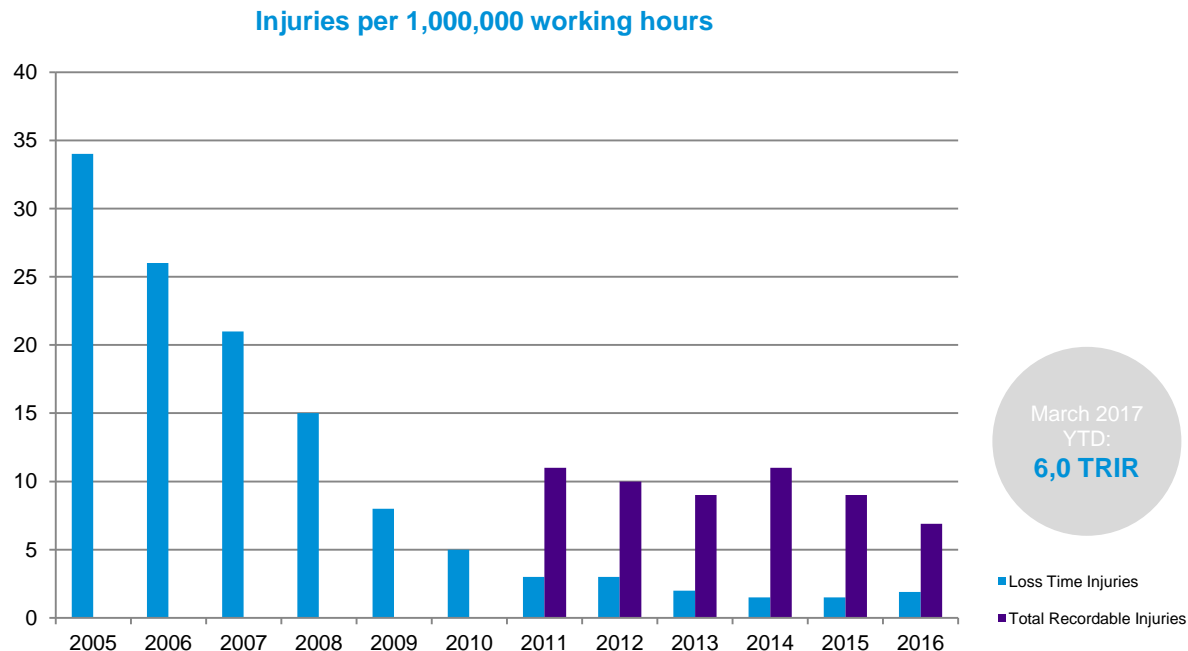


Advancements in safety

Continuous improvements through targeted efforts

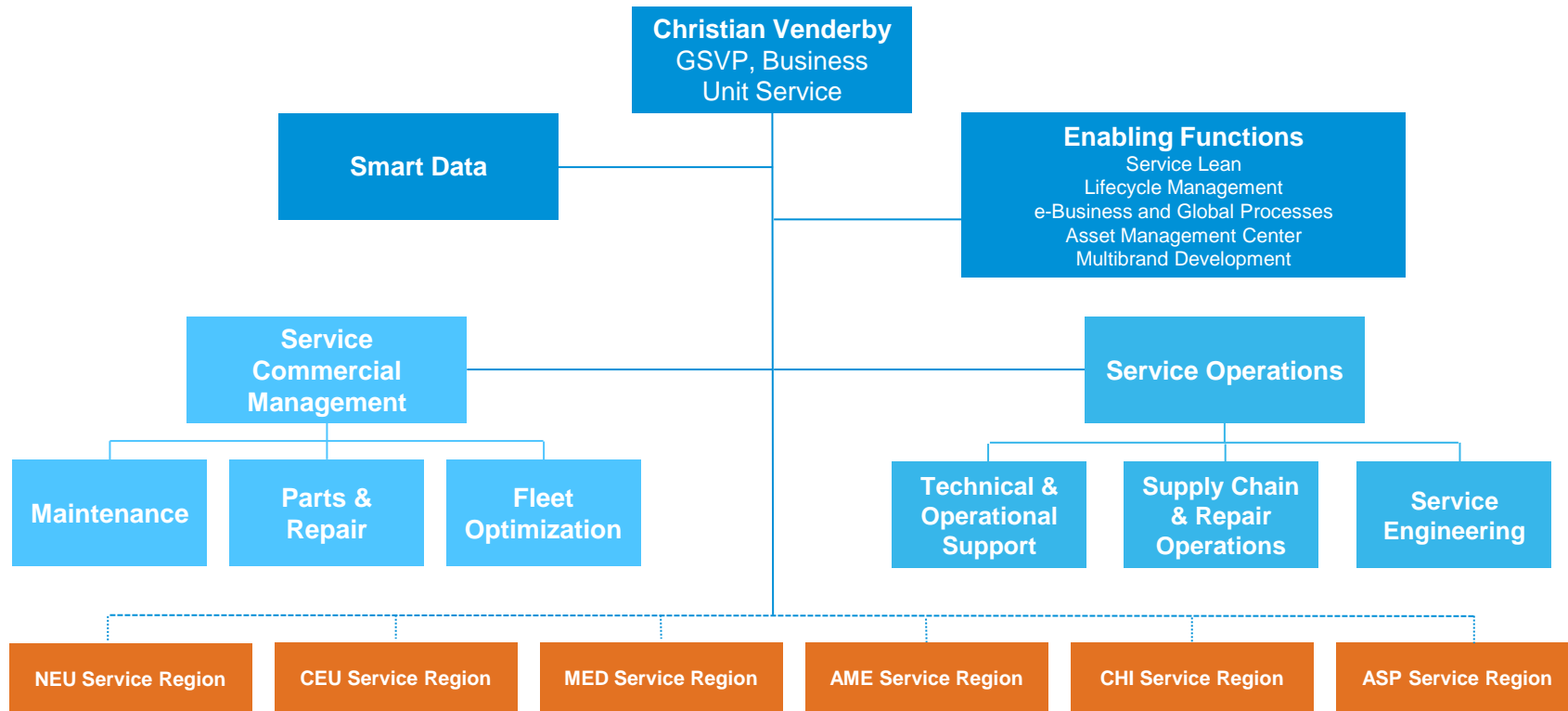
Safety achievements

- In 2011, Vestas begins tracking Total Recordable Injuries (TRI), which includes “restricted work injuries” and “medical treatment injuries” – providing greater insight for safety activities.
- The target for 2016 was 8.0 total recordable injuries per million working hours and the target was reached, with the incidence rate at 6.9 per million working hours.



Vestas Service Strategy - Ramp-up of service set-up

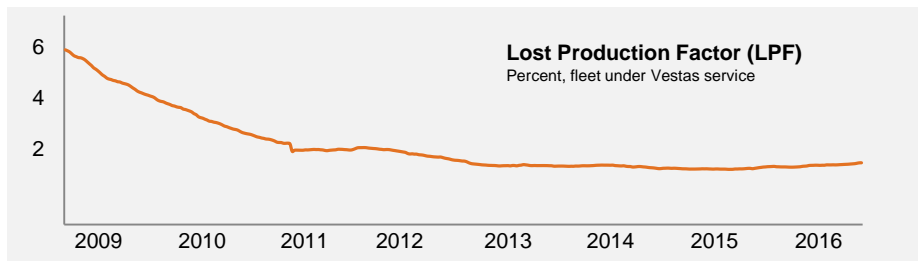
Vestas builds a service organisation that can facilitate the growing focus from our customers



Strategic Initiatives - Advanced Service Offerings

Turbine owners are looking for higher business case certainty and increased flexibility

With maximised turbine uptime, asset owners look for new opportunities to their improve business case



Maintenance

- Customized service offerings
- Beyond traditional guarantees
- Enabling in-source solutions

Parts & Repair

- Spare parts framework agreements
- Active Material Management
- Main component coverage (fixed fee)

Fleet Optimisation

- AEP enhancing performance upgrades
- Life time extension
- Improved availability

Vestas Training

Certified and globally consistent

Strategic Training Focus Areas

Alignment of training capacity and demand

Establishing and reinforcing regional training requirements

Assessment and selection of new learning technologies

Constant development of the 'Technician Pipeline'

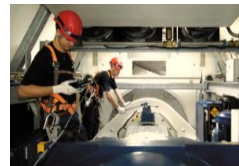
Vestas-technician training approaches



1. Theoretical courses



2. Practical exercises



3. Practice in the field



3,810 Training Courses delivered in the last 12 months



32,382 conducted training days in 2015¹
☐ 242,866 hours



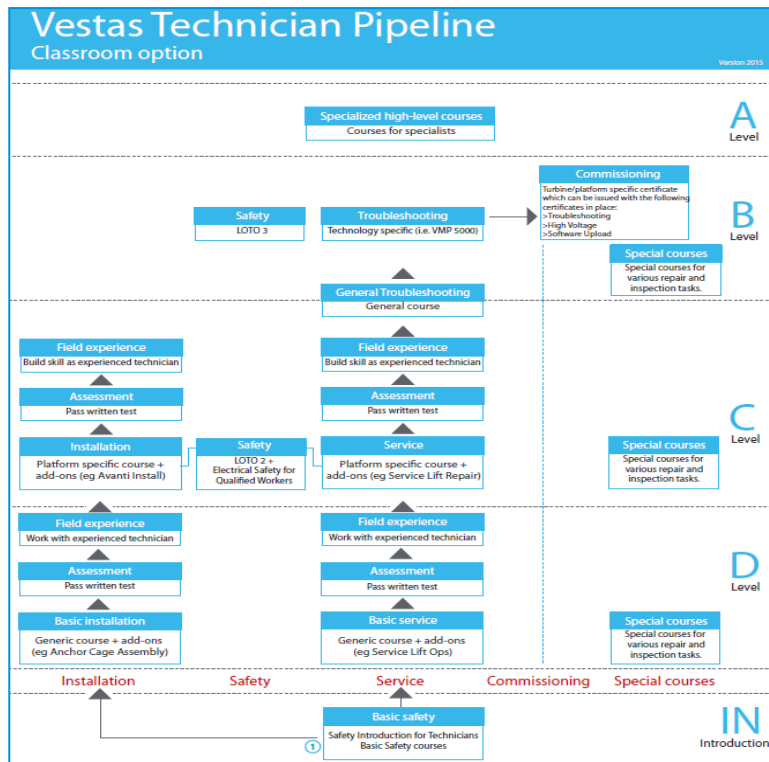
74 global TSTC² Instructors worldwide



+30 years of training experience

Technician Training

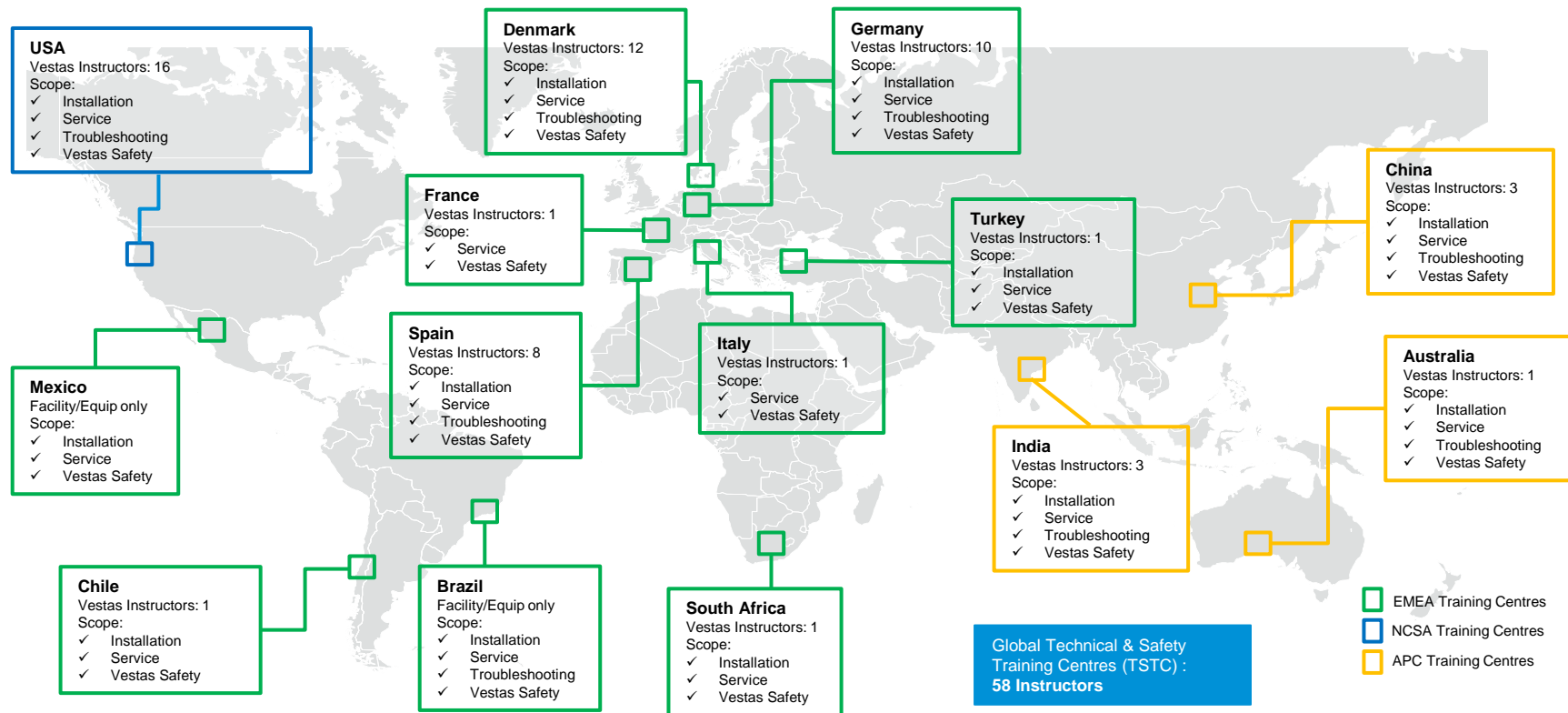
Central to Vestas' training strategy is the 'Vestas Pipeline'



Technician development

- All technicians are sent through company, safety, rescue, general turbine, and specific turbine training
- As their career progresses technicians specialize in certain technologies such as SCADA, blades or gearboxes. Others are identified for leadership roles and given management & leadership training
- It takes a highly experienced workforce to achieve our guaranteed performance targets. Therefore we invest a lot in our technicians and pay particular attention to technician retention

Technical & Safety Training Set Up



Flexible O&M Offerings

A maintenance partnership tailored to the need of your wind farm

AOM
1000

You gain access to all of Vestas' capabilities, available on a time and material basis.

AOM
2000

Sustained turbine performance through regular preventative maintenance, with all components available on a time and material basis, and a selection of optional add-ons.

AOM
3000

A complete package with a flat fee, and main components on a time and material basis. Your risk profile is shared with Vestas. Once your initial contract has expired, AOM 3000 enables you to replace it with a model for greater risk sharing.

AOM
4000

Everything your turbine requires, including main components and materials. This option includes a time-based availability guarantee of up to 97% uptime. You can also use our new Vestas Performance Manager software, ensuring complete transparency at all times.

AOM
5000

AOM's all-inclusive, comprehensive energy-based option. Energy based availability guarantee maximizes output by carrying out service and maintenance only during low-wind periods. Guarantee based on 97% energy-based availability, moving the availability measure from hour to power.

Active Output Management

Performance concepts tailored for you



AOM 1000

Maximum flexibility

You gain access to all of Vestas' capabilities, available on a time and material basis.

AOM 2000

Reduced risk

Sustained turbine performance through regular preventative maintenance, with all components available on a time and material basis, and a selection of optional add-ons.

AOM 3000

Shared risk

A complete package with a flat fee, and main components on a time and material basis. Your risk profile is shared with Vestas. Once your initial contract has expired, AOM 3000 enables you to replace it with a model for greater risk sharing.

AOM 4000

Maximized uptime

Everything your turbine requires, including main components and materials. This option includes a time-based availability guarantee of up to 97% uptime. You can also use our new Vestas Performance Manager software, ensuring complete transparency at all times. Contract covers periods up to 10 years, with the possibility to extend for 2 x 5-year periods.

AOM 5000

Move wind from hour to power

AOM's all-inclusive, comprehensive energy-based option. Energy-based availability guarantee maximizes output by carrying out service and maintenance only during low-wind periods. Guarantee based on 97% energy-based availability, moving the availability measure from hour to power. You can also use our new Vestas Performance Manager software, ensuring complete transparency at all times. Contract covers periods up to 10 years, with the possibility to extend for 2 x 5-year periods.

Strategic Initiatives - Advanced Service Offerings

Proven performance enhancing upgrades to ensure optimised production throughout lifetime

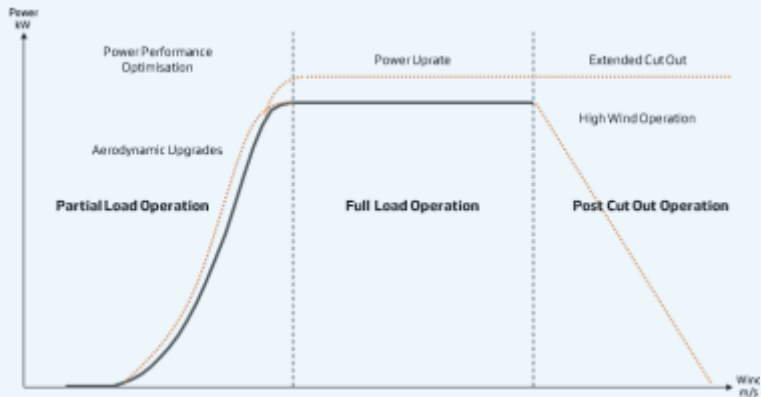
PowerPlus™

Increase AEP by optimizing turbine operations

**+5%
AEP**

**+3,000
Turbines**

**Value
sharing**



LifePlus™

Extend profitable turbine life

Life extension
analysis

Basic
upgrades

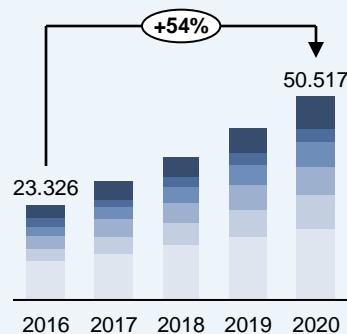
Performance
upgrades

Refurbishment

Partial
Repowering

Profit potential

Global fleet is aging – asset owners look to make the most of investments



Global fleet of turbines aged +15 years
#WTGs

Other GE Gamesa
Siemens Enercon Vestas

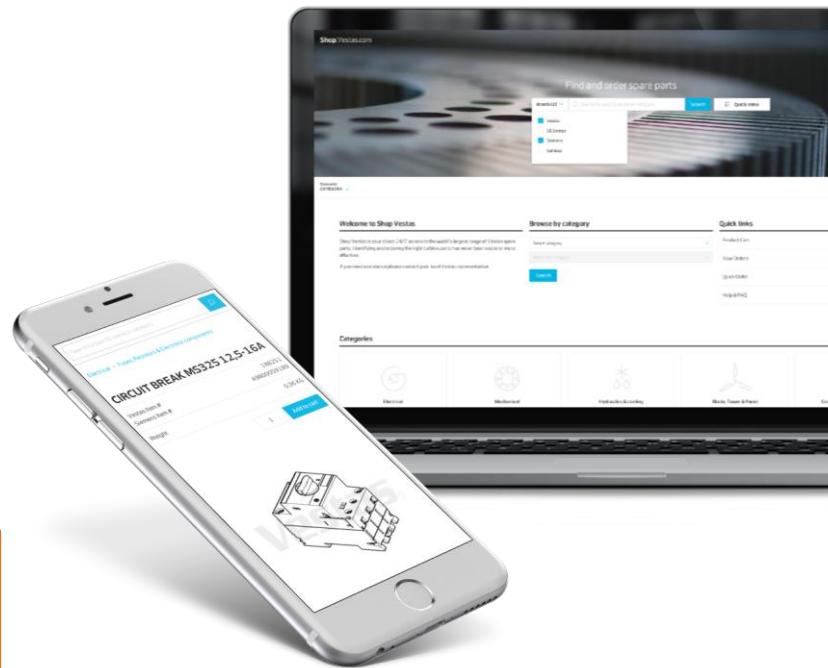
Shop Vestas. Simple solutions for your business

The largest turbine spare parts catalogue in the world

- Access to order and buy more than **19,000** turbine spare parts online. The largest online catalogue in the world
- Efficient **Direct order** functionality
- **Customer price** availability
- **Stock indications** based on your geographical location
- **WTG type** navigation and search
- Central location for **order updates & history**
- **Quick-order** and **Re-order** functionality

Further extended access for selected customers:

- Browse and buy even more **multibrand** spare parts
- Identify and buy more spare parts via **assembly drawings**
- **Track and trace**



Strategic Initiatives - Multibrand Services

Owners of diverse fleets are facing increasingly complex service structures

Multi vendor service management involves several challenges:

Quality

Varying quality of services across fleet

Supply Chain

Buying into several supply chains

Knowledge sharing

Minimal knowledge-sharing across fleet

Safety

Varying safety performance across fleet

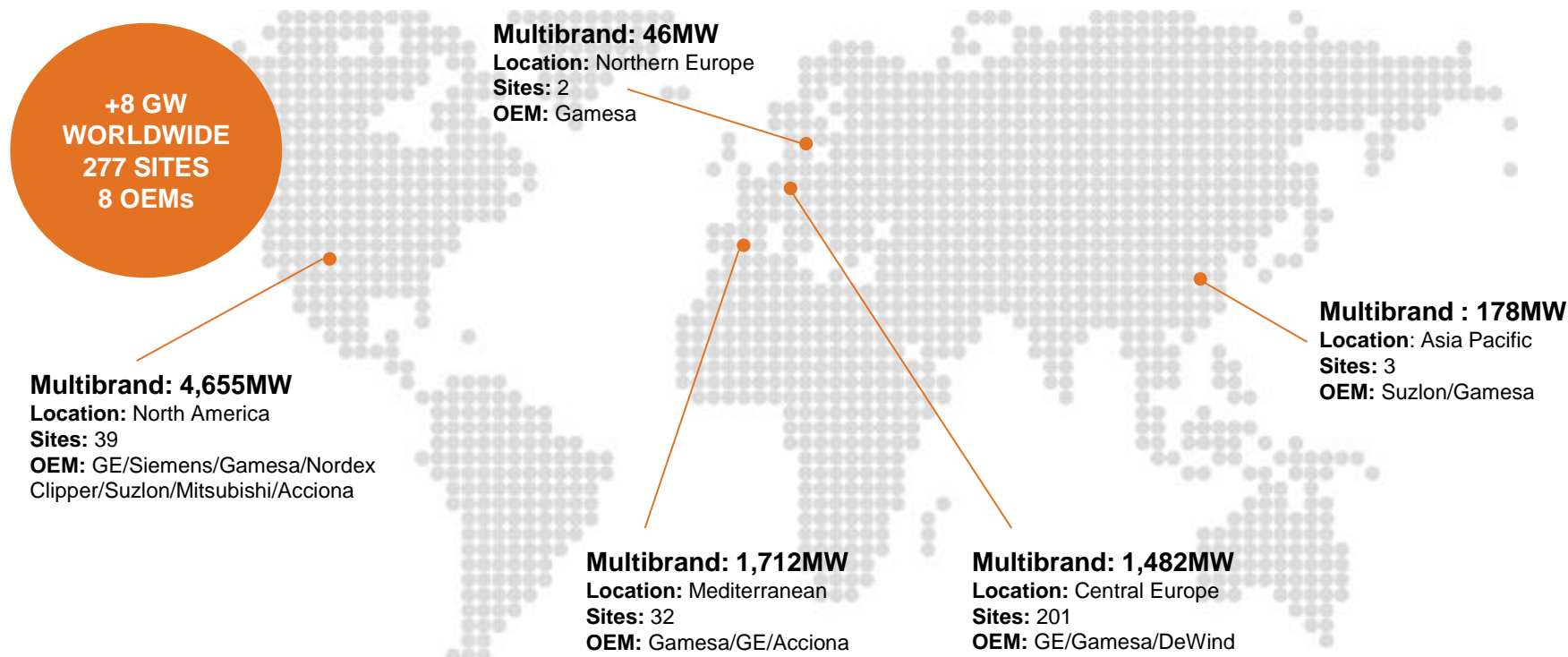
Efficiencies

Minimal opportunities to achieve fleet-wide efficiencies

Vestas provides a **Multibrand One-Stop Shop** enabling fleet-wide optimization to lower LCoE

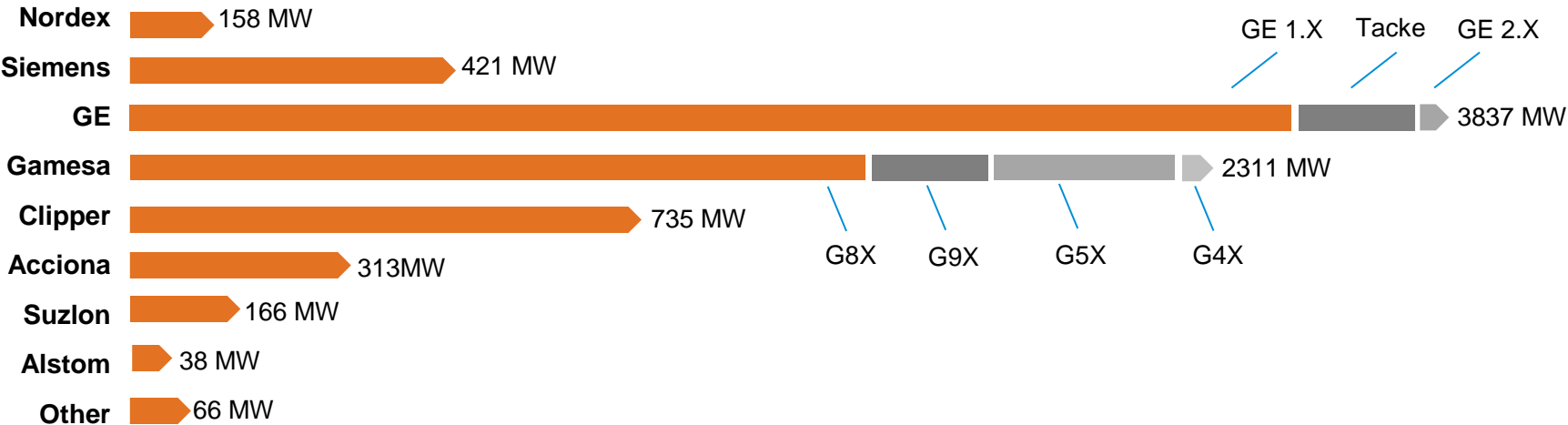
Servicing >8 GW of multibrand fleets across the world

Deploying global reach and local presence to the benefit of our customers



Servicing more than 8 GW of multibrand

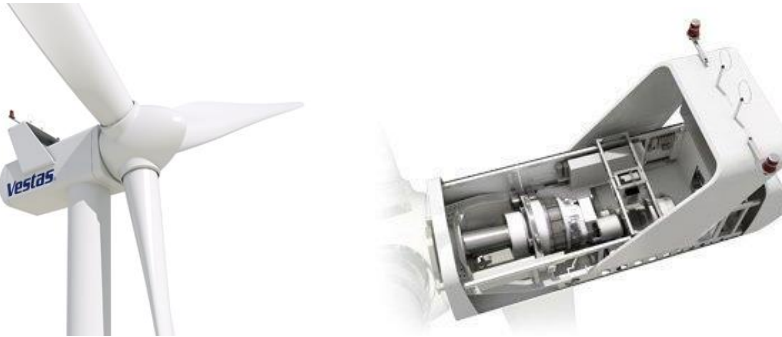
Multibrand capabilities proven across a wide range of platforms



Superior serviceability on geared solutions

The integrated generator and drivetrain design leads DD turbines to have fewer, but significantly larger and more costly parts, making them expensive to repair if a failure occurs

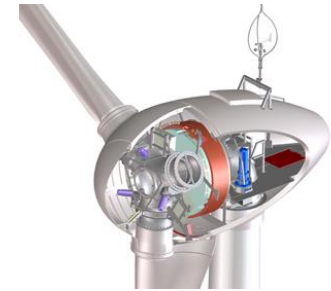
Maintenance of **geared technologies**



The V112 is an example of flexibility and plug-and-play solutions

The modular system in, e.g. the V112 allows individual components to be changed with ease. If there is any form of equipment failure the LPF will be low because that equipment can be changed fast.

Maintenance of **direct drive technologies**



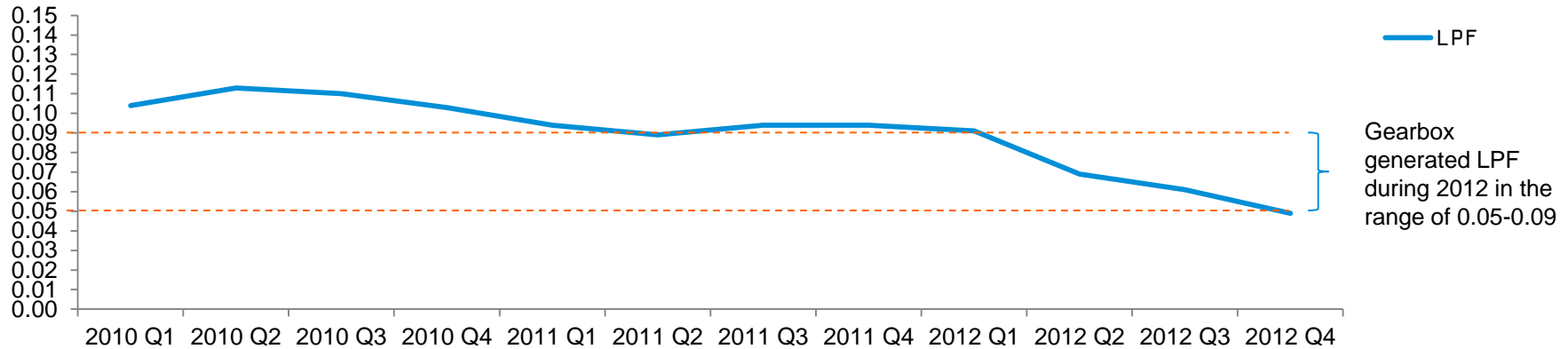
Direct drive WTGs with large and highly customised parts

The simple composition of DD WTGs means that individual parts become very large, and very expensive and time consuming to change if any failures occur

Gearbox failures account for **0.05% of lost production**

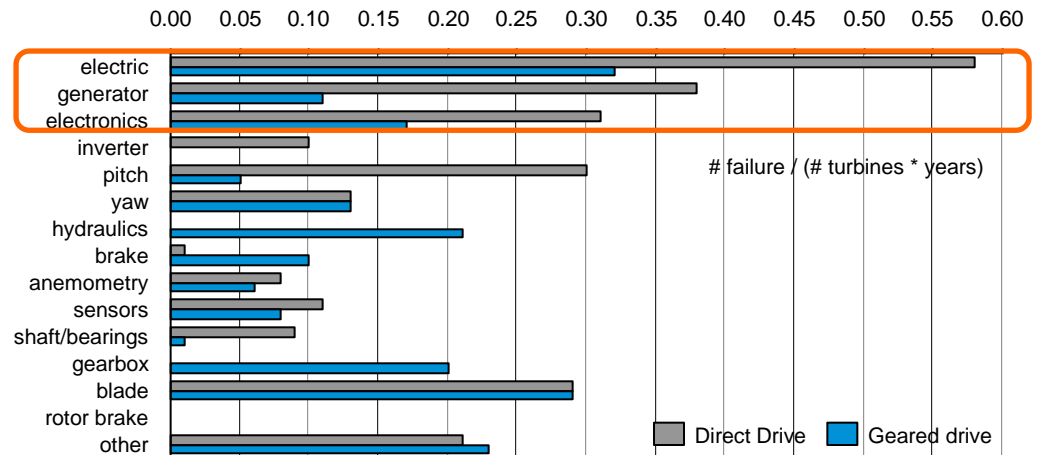
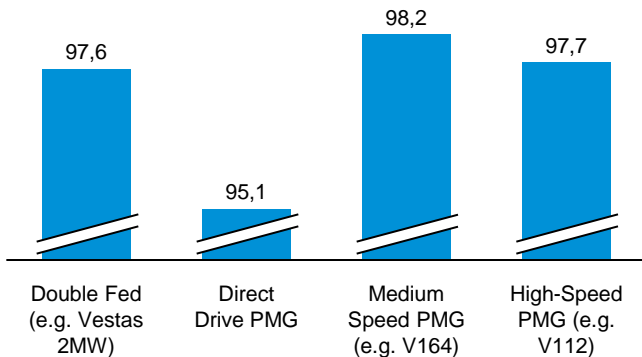
By the end of 2012, lost production generated by gearbox failures across the entire 2MW platform drops to 0.05%, signalling clearly the quality of Vestas geared drive trains

Vestas 2MW LPF generated by gearbox failures, 2010-12, 1 year rolling



Independent analysis from ABB*

Efficiency at nominal rate



Sources: Vestas, Performance and Diagnostic Centre/VPDC / Data: One year rolling LPF, 2MW platform, Sample: data is based on a sample size of 3596 – 7793 turbines. / * Source: Wind Generator Technology – Reliability & O&M (Conference Presentation), ABB Group, 25 January 2012

Wind. It means the world to us.™

Thank you for your attention

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