

Siemens Gamesa Onshore

Your experienced technology partner



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Company profile

Key facts¹



138.5 GW
Globally installed



29 k
Employees



€ 9.1 bn
Annual revenue²



> € 40 bn Order
backlog



Truly global, modern
and scalable footprint



Advanced digital
capabilities

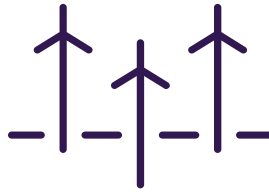


Portfolio covering
all requirements

¹ Figures as end of December 2023.

² Figures as end of September 2023.

Ownership structure



Siemens Energy AG
100%

Siemens Gamesa is a **global company**, based in Zamudio (Vizcaya, Spain).

It has Siemens Energy AG as sole significant shareholder holding.

Activity



Onshore

113.5 GW installed in 79 countries.

13 GW of wind farms developed in 14 countries.

An experienced technology partner for your wind projects.



Offshore

25 GW installed worldwide since 1991.

Most experienced offshore wind company with the most reliable product portfolio in the market.



Service

83.7 GW maintained.

Commitment beyond the supply of the Wind Turbine Generator (WTG) to achieve the profitability objectives of each project.

Three business units strongly positioned in the market

Onshore business

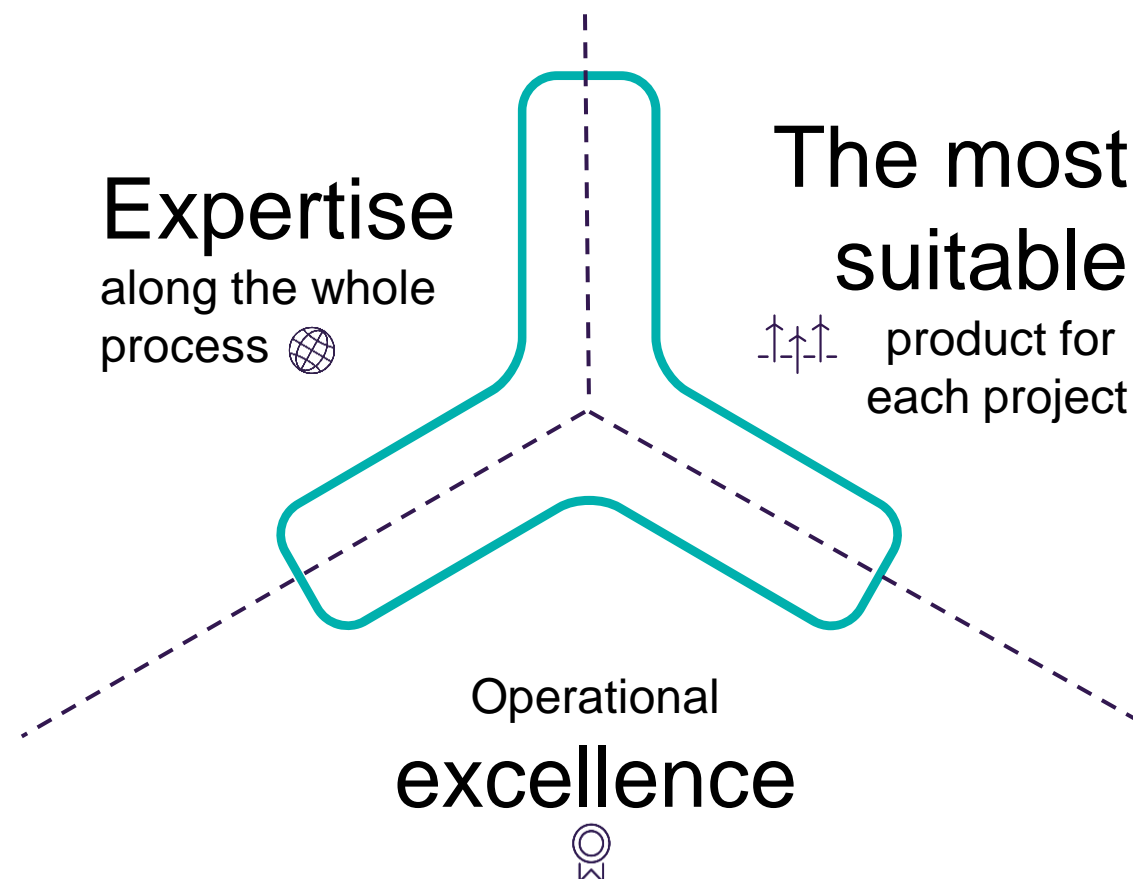
Over 40 years' experience,
113.5 GW onshore installed in
79 countries and **70.2 GW**
under O&M.

Siemens Gamesa technology:

- Optimized performance through tailored product configuration.
- Covers customer needs and market requirements, allowing complete control and flexibility.

* Figures as of CY4Q2023.

Key facts and figures*



Your experienced technology partner

Driven by innovation



To set **new standards** in the industry



To create **value** for our customers

Committed to developing efficient products and solutions to improve performance and competitiveness

Operational excellence

Siemens Gamesa recognized in the sector



113,489 MW onshore installed in 79 countries.

Siemens Gamesa is the **3rd largest supplier** by cumulative installed capacity in 2022 with a market share of **18.8%**¹.



12 of the 15 wind largest asset owners by cumulative installed capacity are Siemens Gamesa's onshore clients because they perceive the agreements achieved to have value².



Our products have the backing of independent consultants and financial bodies.

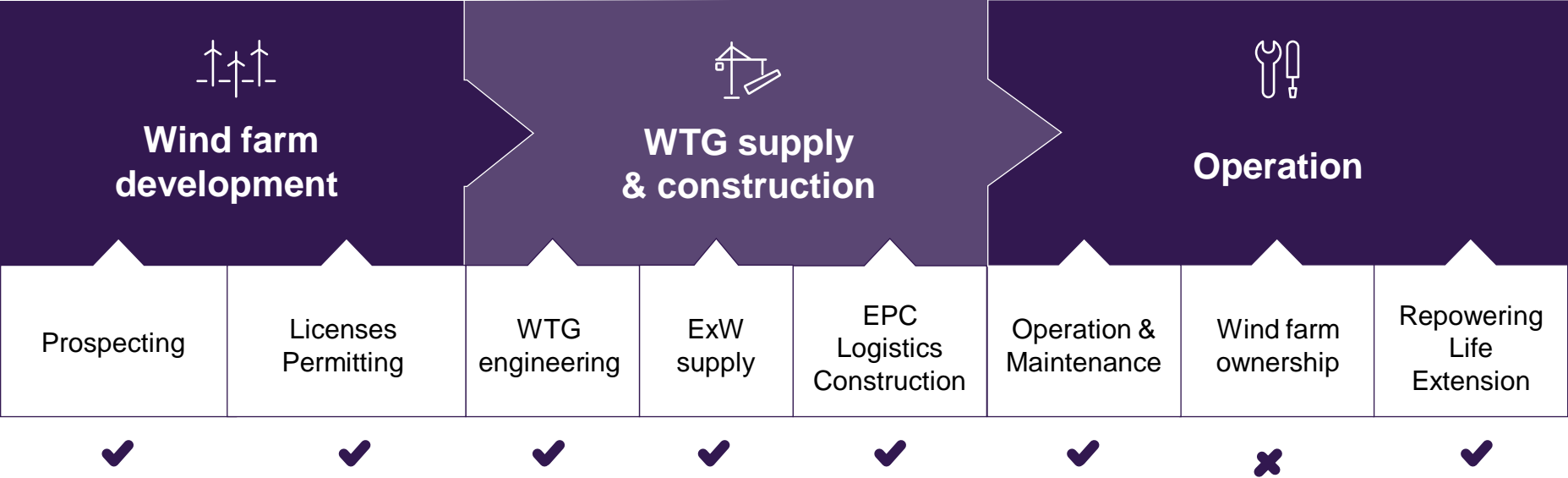
¹ Wood Mackenzie, Global Wind Turbine OEM 2022 Market Shares Database (May 2023).

² Wood Mackenzie, Global Wind Power Asset Ownership 2023.

Value chain presence

The only manufacturer with a wide experience

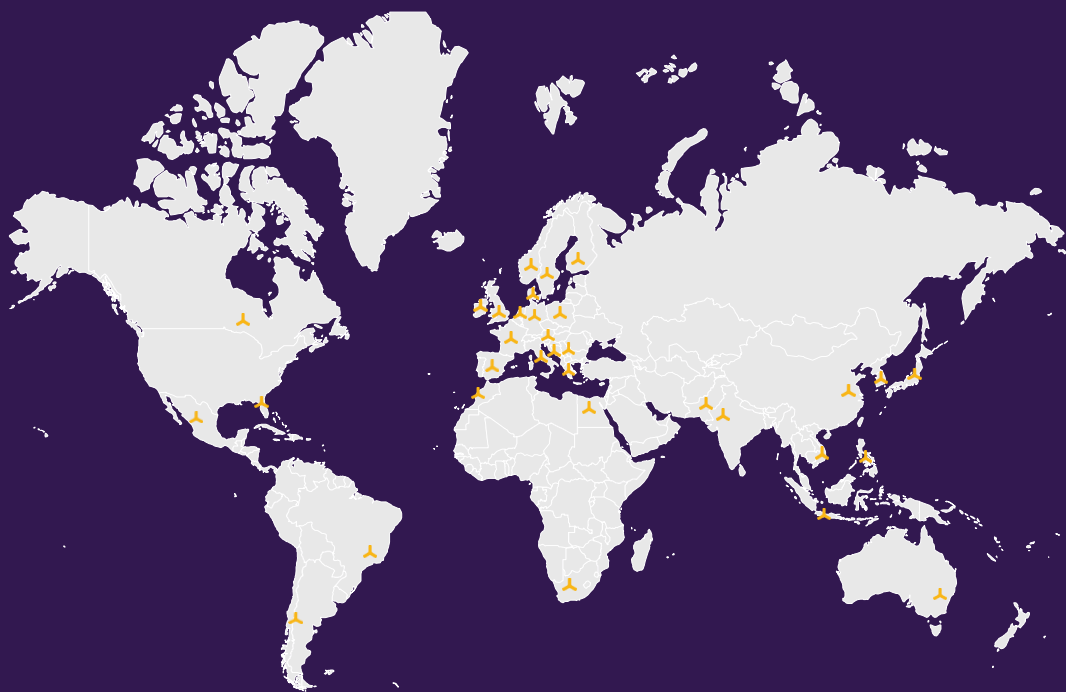
Our wide experience throughout the whole value chain allows us to lead and advise our clients along the different phases of their wind projects:




Optimized solutions for each project and in all markets

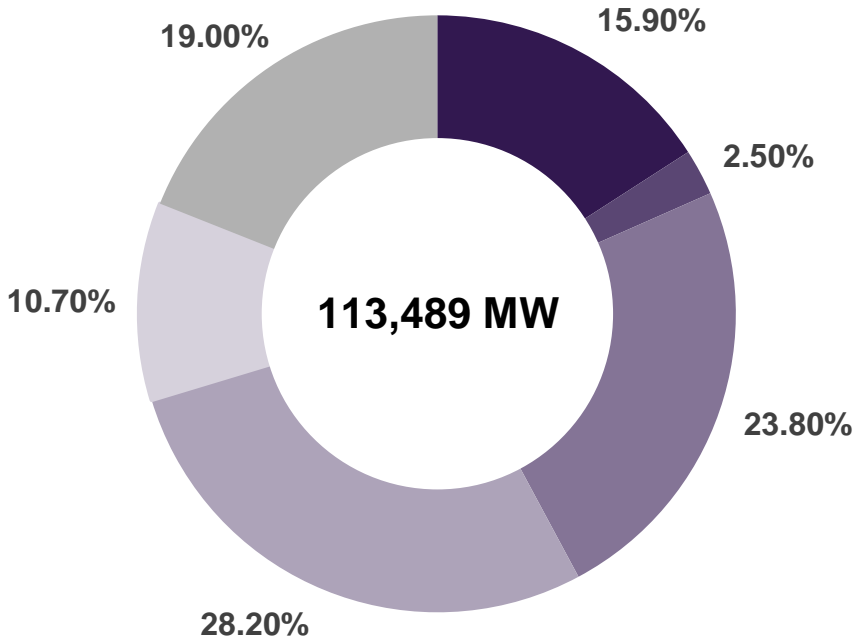
Global footprint

Geographic diversification allowing growth in emerging and mature markets



 Commercial offices in 33 countries across the world.

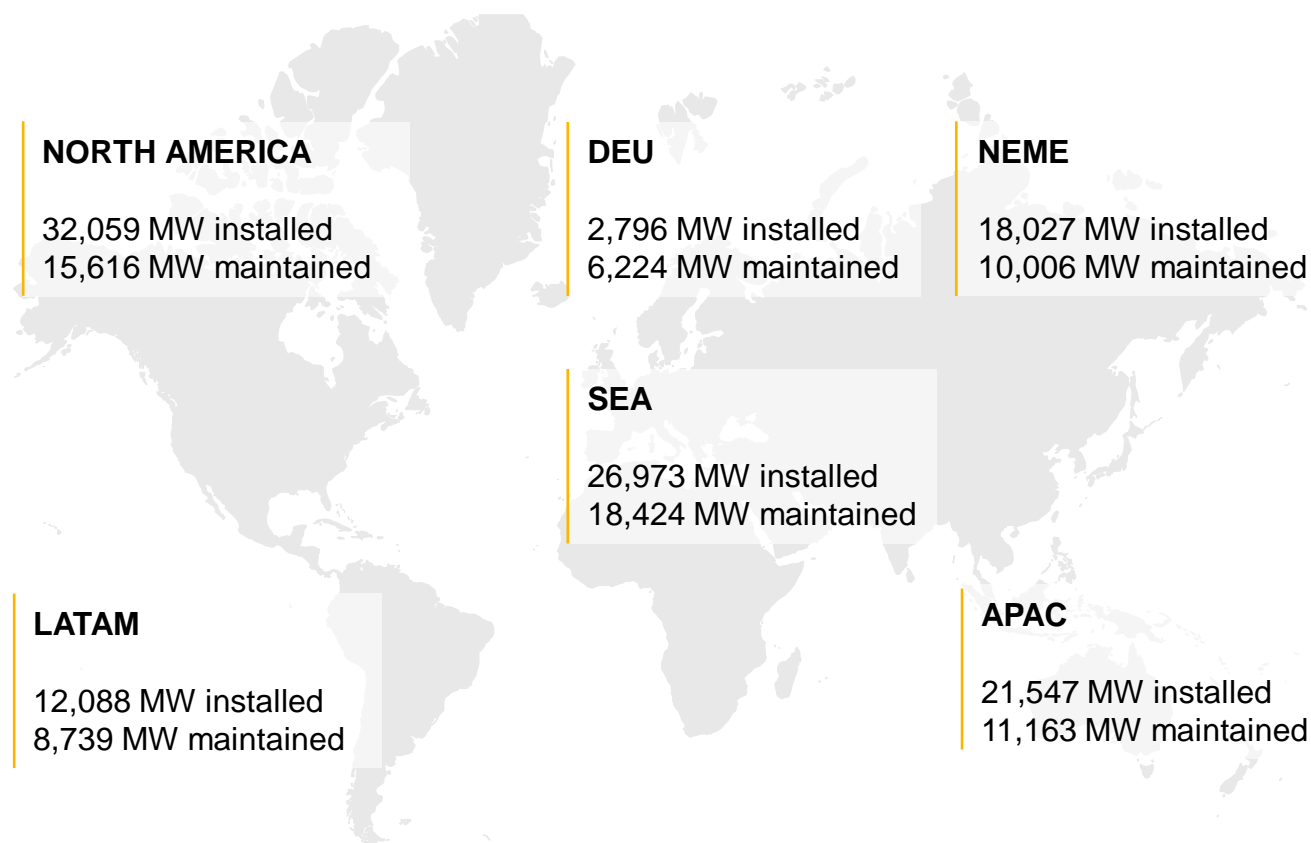
Accumulated track record – CY4Q2023



■ NEMEA ■ DEU ■ SEA ■ NA ■ LATAM ■ APAC

Operational performance

Global supplier



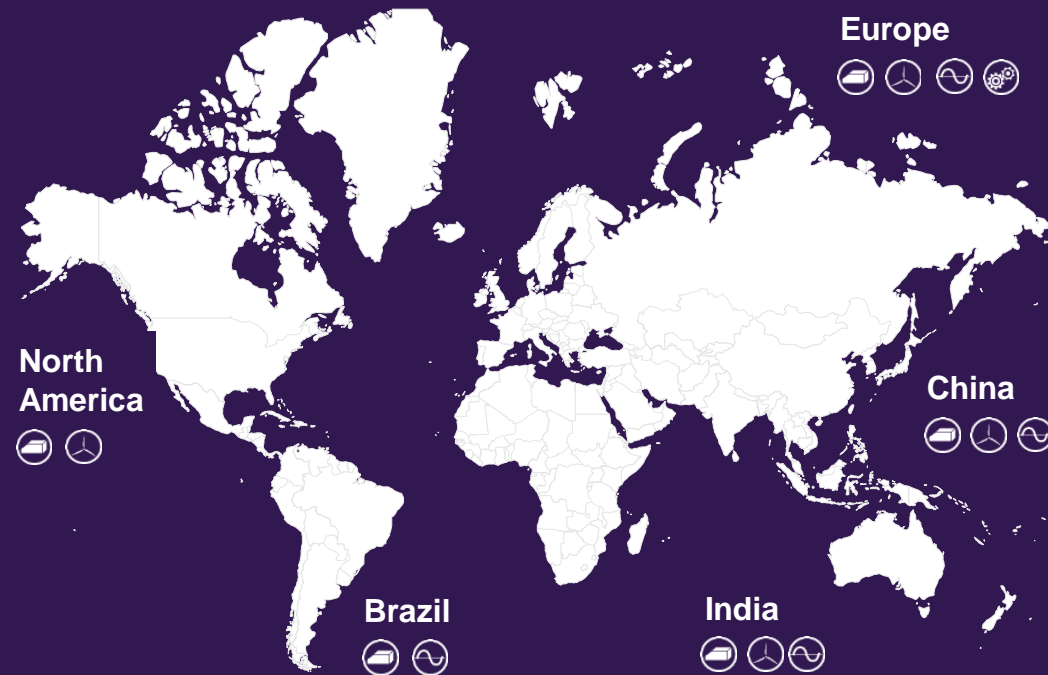
1,025 MW
installed in CY4Q23

113.5 GW
of capacity installed

70.2 GW
in O&M

Figures as of CY4Q2023.

Production centers in the main wind markets



 Gearboxes  Nacelles  Electronics  Blades

- Technical presence close to the customer.
- Supervision of the whole production process. Design and manufacturing of WTGs critical components:
 - Electronics: Gamesa Electric.
 - Gearbox: Gearbox by Gamesa.
- Establishment of strategic partnerships with leading global suppliers of components:
 - Blades: LM, Aeolon.
 - Towers: Windar Renovables*, CS Wind, GRI.
 - Gearbox: ZF, Winergy, NGC.
 - Generators & converters: Flender, Ingeteam, ABB, KKWind.

Customer proximity, full process control and delivery optimization.

Turnkey projects. Integral construction services

Wide experience in turnkey projects (EPC) worldwide, pre-design in-house capacity, final design, civil works, electric works and high-voltage power lines.

Total # Wind Farms

(in operation + under construction)

489

Including full supply

⚡ In operation (480): 17,891 MW
🏗️ Under construction (9): 429 MW

World-class experience in BoP,
including complex projects.

**NORTH
AMERICA**
10 wind farms

NEME
39 wind farms

DEU
61 wind farms

LATAM
24 wind
farms

SEA
225 wind
farms

APAC
130 wind farms

Figures as of CY3Q2023.

Global experience in wind farms

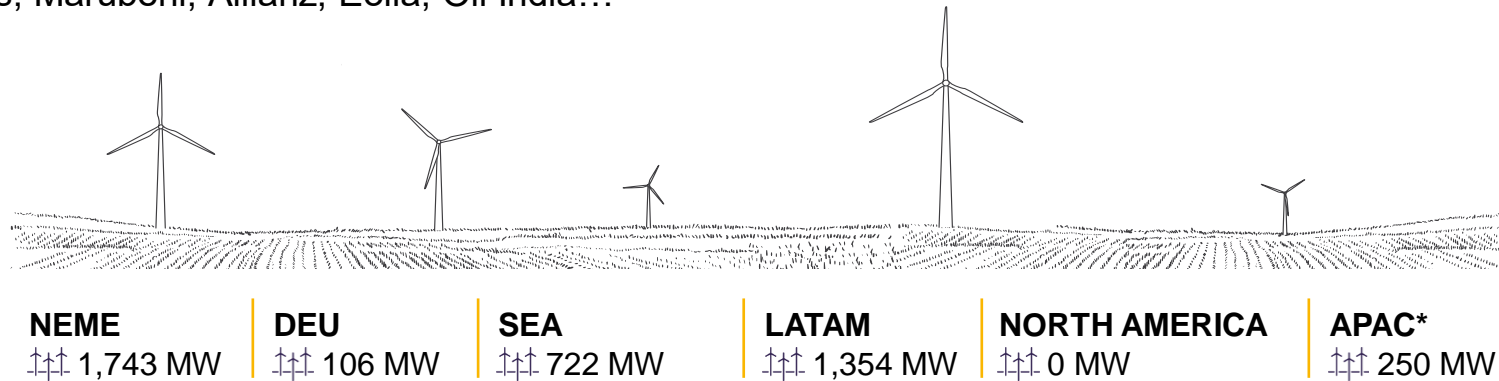
21 years of experience in wind farms development

13 GW of wind farms developed and built in 14 countries

Pipeline of 4.2 GW in different stages of development in 12 countries

Among our clients are large utilities, IPPs and investors around the world that rely on our expertise in wind farms activity:

- Utilities: Iberdrola, Huadian, CGN, HECIC, RWE, ENEL, E.On, EDP, EDF...
- IPPs: IKEA, Gestamp, Taiga, John Laing, Greenko, Tata, Algonquin Power...
- Investors: Viridis, Marubeni, Allianz, Eolia, Oil India...



Figures as of CY4Q2023.

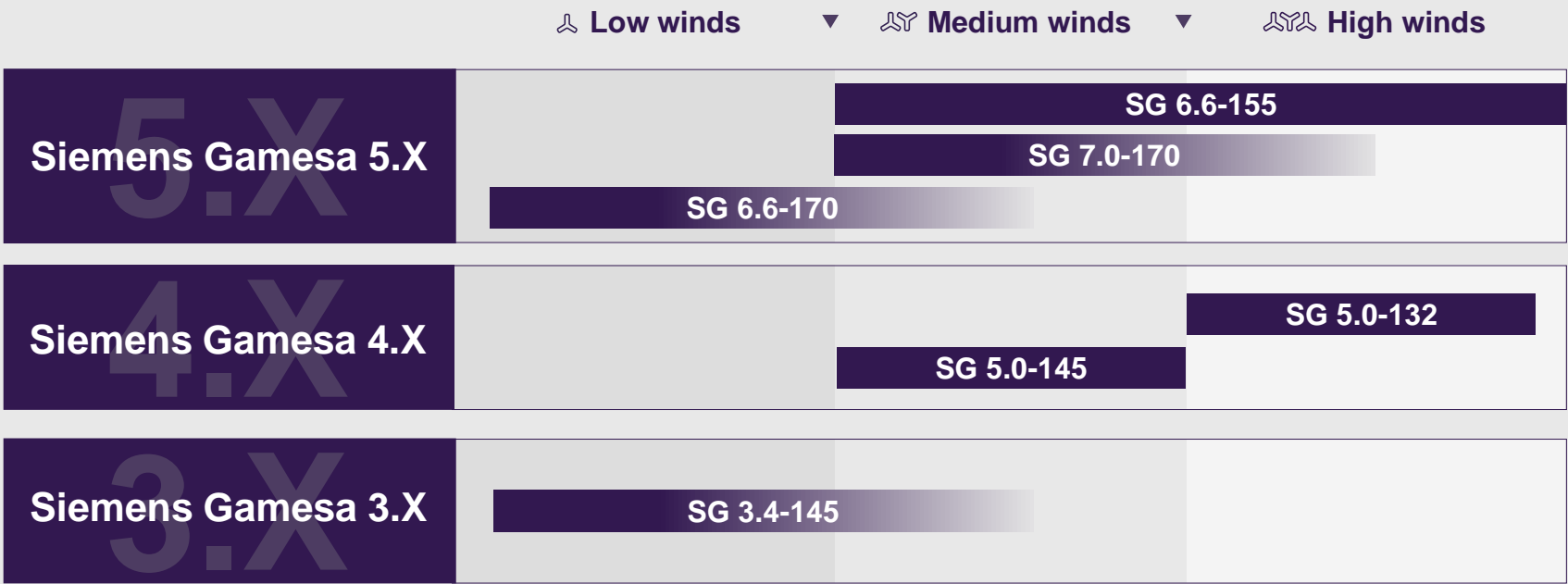
*INDIA: met mast and project scouting activities based on 5 GW of wind data pipeline.

Technological supplier with unique experience in the development of wind farms

Onshore product portfolio

The most suitable product for each project

Our Onshore product portfolio



Country-specific solutions

USA

SG 4.4-164
Medium winds

NEW

SG 2.9-129
Medium and low winds

JAPAN

SWT-DD-130
Thyphoon class

SWT-DD-120
Thyphoon class

FRANCE
SG 3.4-132
Medium winds

OptimaFlex

Optimization through flexibility

Beyond the traditional off-the-shelf approach, which results in products that more or less fit all the sites, but are sub-optimal for many, OptimaFlex delivers a uniquely tailored solution that is perfect for our customers' specific needs.

Optimized site design combined with a customizable product platform, based on flexible power rating, site specific towers and optimized BoP solutions, allow Siemens Gamesa to deliver reduced LCoE by increasing AEP and optimizing cost.



WTGs can be precisely configured to adapt perfectly to site conditions, thus offering our customers the most suitable product for their projects.



OptimaFlex

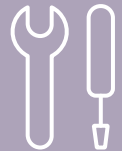
Tailored solutions adapted to customer's needs

The availability of variable power ratings allows turbines to be optimized to suit each individual project and achieve maximum returns.



Early engagement with customers combined with advanced siting and design tools allows for optimum wind farm and maximum asset utilization.

Market broader tower portfolio enabling cost savings from very early bidding stages. Site & market customized designs maximizing competitiveness.



Customized solutions. Reduce total WF cost through optimized design leveraging BoP, logistics & construction with cross-functional management of the project ONE.

Continuously evolving technology

We are **focused on specific technologies** to deliver solutions that comply with the latest regulations and enable our customers **to bring down** their projects' **LCoE**:

- Weak grid solutions.
- Technologies for cold climates.
- Optimized foundations.
- Advanced control strategies:
 - Robust control systems.
 - Control auto-tuning for site adaptation.
 - New sensors and monitoring solutions for LCoE reduction.
 - Wake Adapt® to reduce wake losses and to optimize the layout of new projects.
 - Assets and data protection within different cybersecurity domains/areas.

In Siemens Gamesa we maximize the efficiency of our WTGs through technological solutions adapted to each project and its varying site conditions.



Technologies for sustainability

RecyclableBlade



RecyclableBlade solution

For the first time in the industry, thanks to a new resin technology, Siemens Gamesa is capable of separating and recycling the blade materials to use them in new applications.

A validated and proven process

- **Decommissioning.**
Disassemble and transport.
- **Immersion in mild acidic solution.**
Resin dissolves in a mild acidic solution at elevated temperature after a few hours.
- **Reclaim of separated components.**
Filter and coagulate resin + rinse and dry glass fiber.
- **Reuse.**
Glass fiber, resin, wood and metal can now be reused.



Siemens Gamesa offer



ON and OF blades.
Same product quality, strength, warranties and service process.



Cost saving as recycled materials can be **sold** instead of paying to get rid of them.



High quality reclaimed blade components due to relative low recycling temperature.



Environmental Social Governance positive for financing.

A pioneering solution to recover and recycle blade materials.

Technologies for sustainability

GreenerTower

- ! **Maximum 0.7t CO₂ equivalent emissions per ton of steel, a 63% minimum reduction for tower steel plates vs. conventional steel.**
- 🏆 **Steel suppliers are validated in a thorough Siemens Gamesa standard qualification process.**
Same steel properties and same quality in addition to 3rd party certification of the CO₂ equivalent emission.

Means to achieve greener steel	Siemens Gamesa offer
1 Use of less energy intensive steel manufacturing processes.	<input checked="" type="checkbox"/> Available now!
2 Increased use of scrap steel.	<input checked="" type="checkbox"/> Same warranties.
3 Increased use of renewable energy for the melting process.	<input checked="" type="checkbox"/> Same strength and quality.
	<input checked="" type="checkbox"/> Significantly less CO ₂ equivalent emissions.

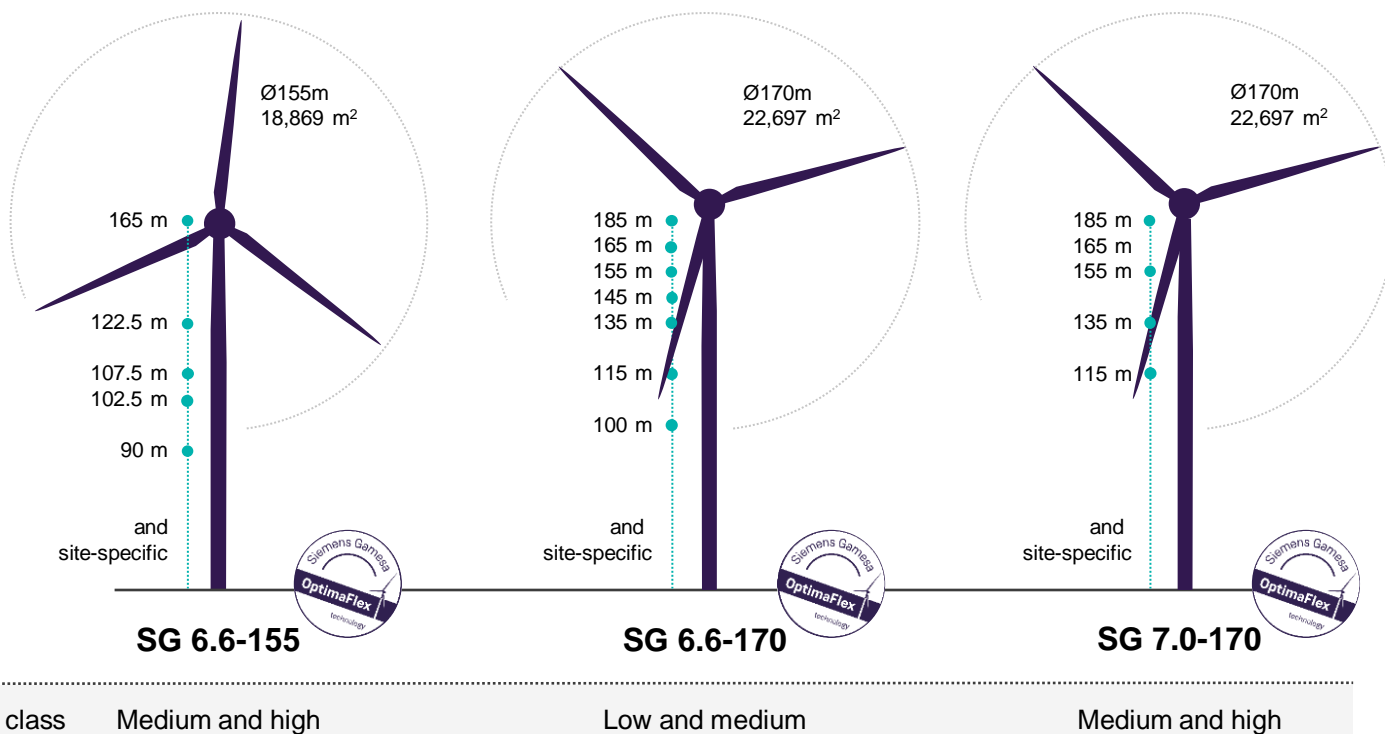
A promising solution to reduce the environmental impact of steel production

Siemens Gamesa 5.X



Siemens Gamesa 5.X

Enhanced performance



- Flexible **power output** and **two rotor sizes** for the most competitive LCoE.
- **Site adaptability** to configure the optimal solution for each project.
- **Versatility**, a highly flexible design for logistics, construction and service.
- Almost 6 GW sold across the world.

New generation Siemens Gamesa onshore platform

Siemens Gamesa 5.X

Product specifications

Main data		SG 6.6-155	SG 6.6-170	SG 7.0-170
	Rotor diameter	155 m	170 m	170 m
	Nominal power	6.6 MW (flexible power rating from 5.6 MW to 6.6 MW)	6.6 MW (flexible power rating from 6.0 MW to 6.6 MW)	Flexible power rating up to 7.0 MW
	IEC class	IIB (25 years lifetime) IIA (20 years lifetime) IA (25 years lifetime)	S/IIIB (25 years lifetime) IIIA (20 years lifetime)	IIA (25 years lifetime)
	Generator output voltage	690 Vac +12%/-10%	690 Vac +12%/-10%	690 Vac +12%/-10%
	Power factor	$\pm 0.90 \cos \Phi$	$\pm 0.90 \cos \Phi$	$\pm 0.90 \cos \Phi$
	Grid frequency	50/ 60 Hz	50/60 Hz	50/60 Hz
	Standard temperature range*	[-20; +40°C] with temperature de-rating	[-20; +40°C] with temperature de-rating	[-20; +40°C] with temperature de-rating

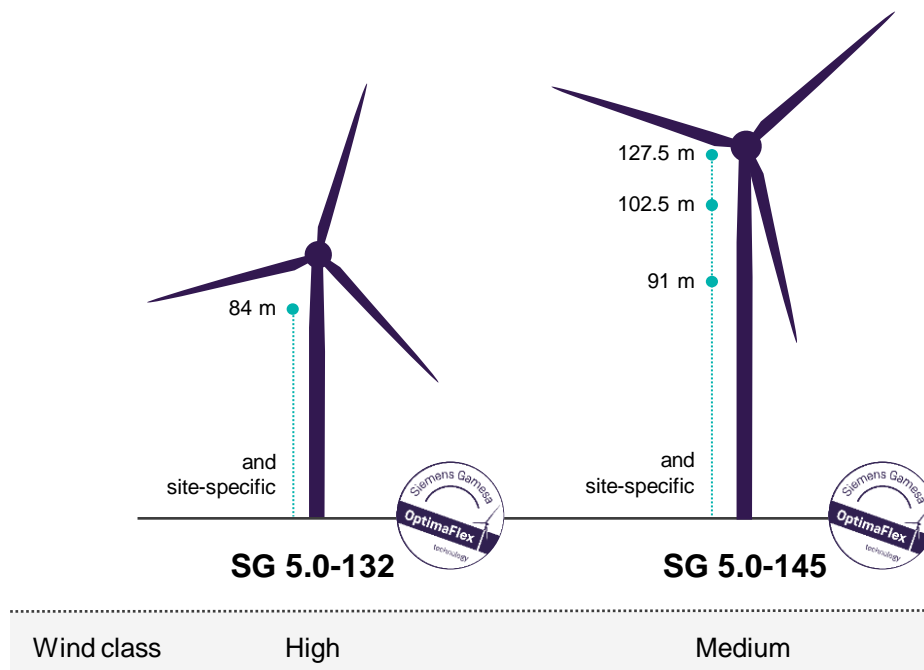
* Additional low- and high-temperature variants available.



Siemens Gamesa 4.X

Siemens Gamesa 4.X

Modularity and flexibility



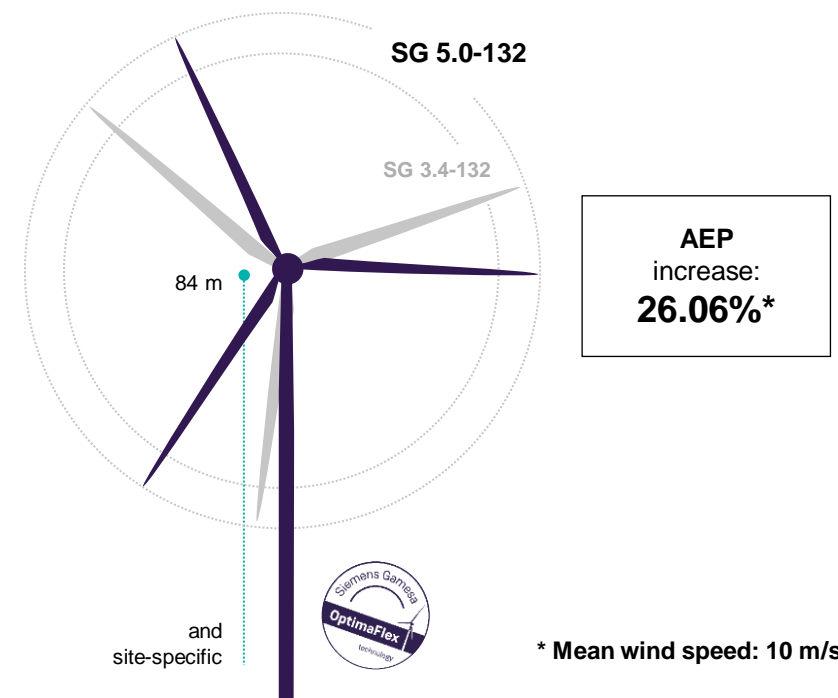
- Two WTG models to cover a broad range of wind conditions.
- A geared platform based on concepts such as a 3-stage gearbox and DFIG.
- **DinoTails® Next Generation to reduce aerodynamic noise.**

A platform targeting LCoE-sensitive markets

Siemens Gamesa 4.X

SG 5.0-132. Our solution for high-wind sites

- **Blade design with large track record** to optimize energy production in high-wind speeds.
- **Flexible power rating** to configure a uniquely tailored solution that fits the specific site conditions.
- **Broad portfolio of turbine options.**
- **Designed for high-wind sites.**



Key milestones

SG 4.5-132

3Q2019

Start of
production

4Q2019

Type
Certificate

SG 5.0-132

1Q2020









Start of
production

2Q2020

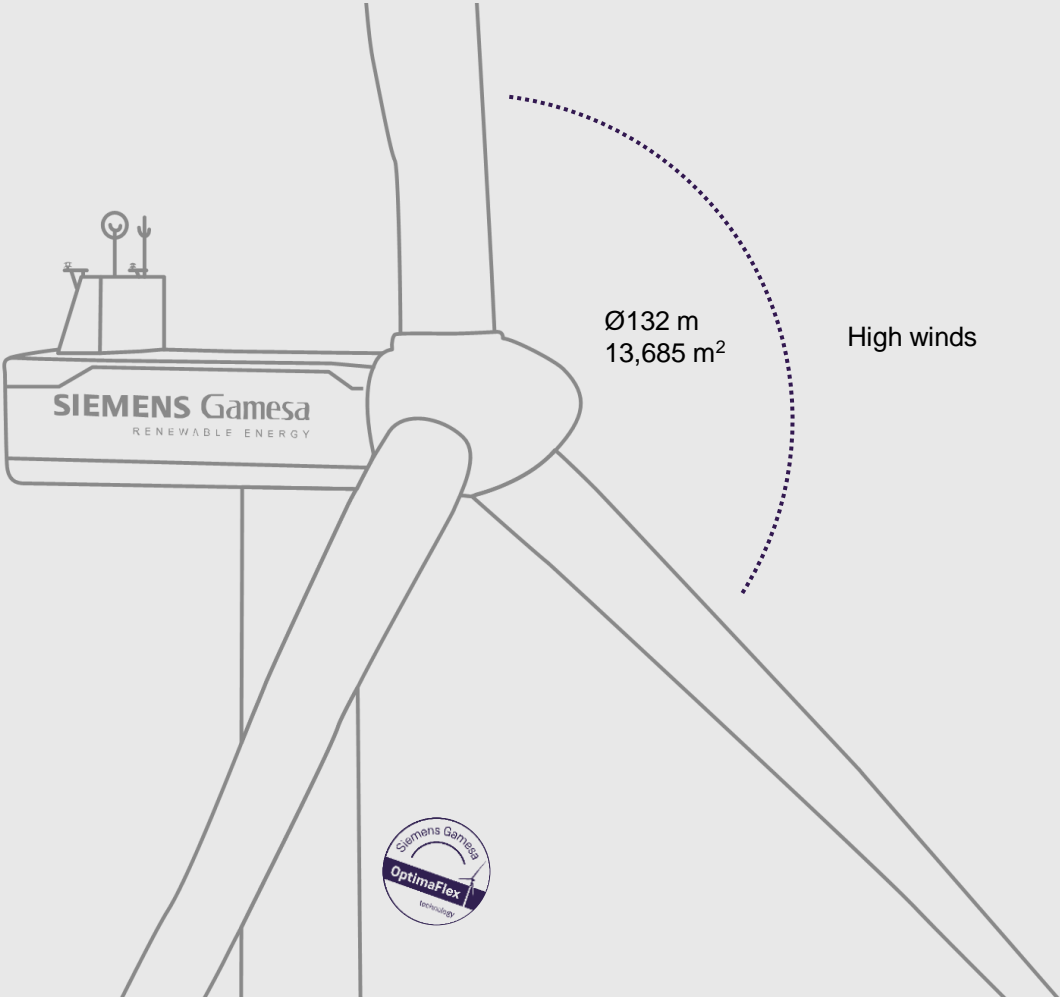
Type
Certificate

Siemens Gamesa 4.X

Product specifications

Main data		SG 5.0-132
	Rotor diameter	132 m
	Nominal power	5.0 MW (flexible power rating 4.0-5.0 MW)
	IEC class	IA
	Generator output voltaje	690 Vac +12%/-10%
	Power factor	± 0.90 Cos Phi
	Grid frequency	50/60 Hz
	Standard temperature range*	[-20; +45°C] with temperature de-rating
	Noise emission level**	105 dB(A)

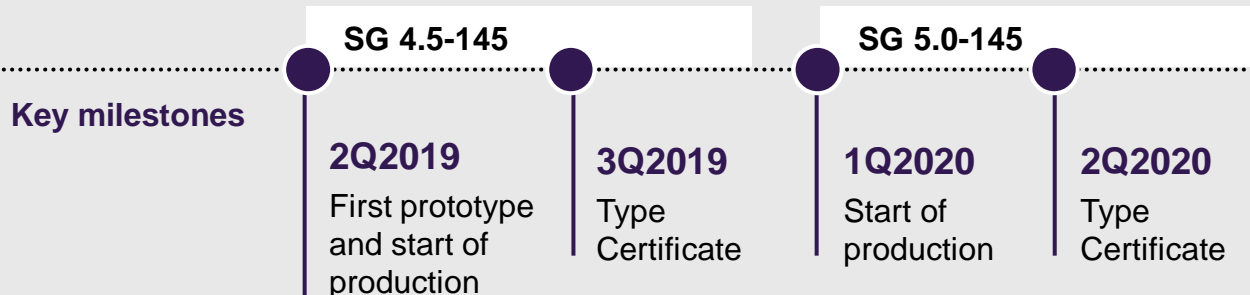
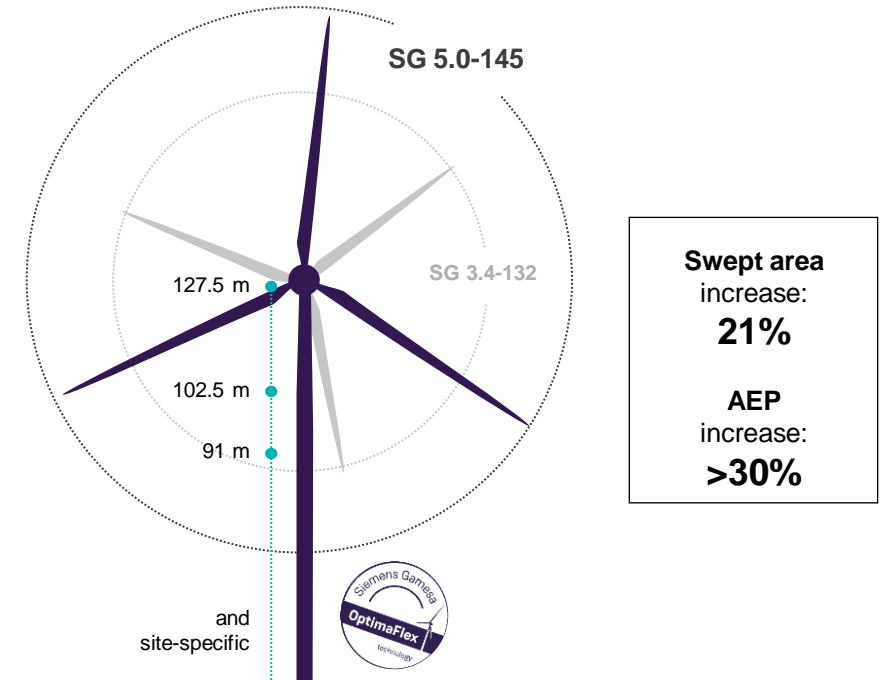
* Additional low temperature variant available.
** Sound power level with blade noise reduction add-ons.



Siemens Gamesa 4.X









SG 5.0-145. Designed for reduced LCoE at medium wind sites

- **New control system** and **enhanced blade aerodynamics** to optimize power generation.
- **Flexible power rating** to configure a uniquely tailored solution that fits the specific site conditions.
- **Structural modularity** for increased mechanical capacity and optimal adaptation to logistics and construction requirements.
- **Broad portfolio of WTG options.**



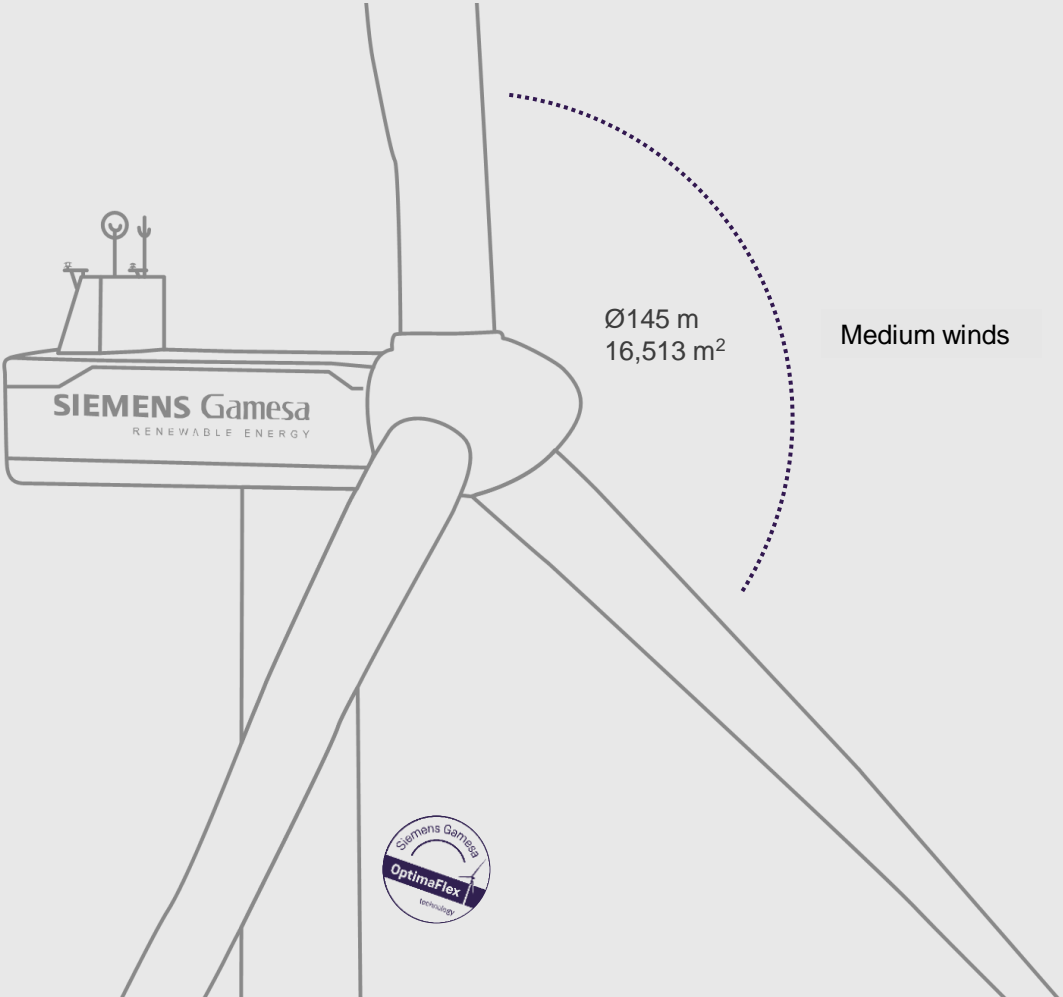
Siemens Gamesa 4.X

Product specifications

Main data		SG 5.0-145
	Rotor diameter	145 m
	Nominal power	5.0 MW (flexible power rating 4.0-5.2 MW)
	IEC class	IIB
	Generator output voltaje	690 Vac +12%/-10%
	Power factor	± 0.90 Cos Phi
	Grid frequency	50/60 Hz
	Standard temperature range*	[-20; +45°C] with temperature de-rating
	Noise emission level**	106.3 dB(A) (depending on rated power)

* Additional low temperature variant available.

** Lower noise modes available.

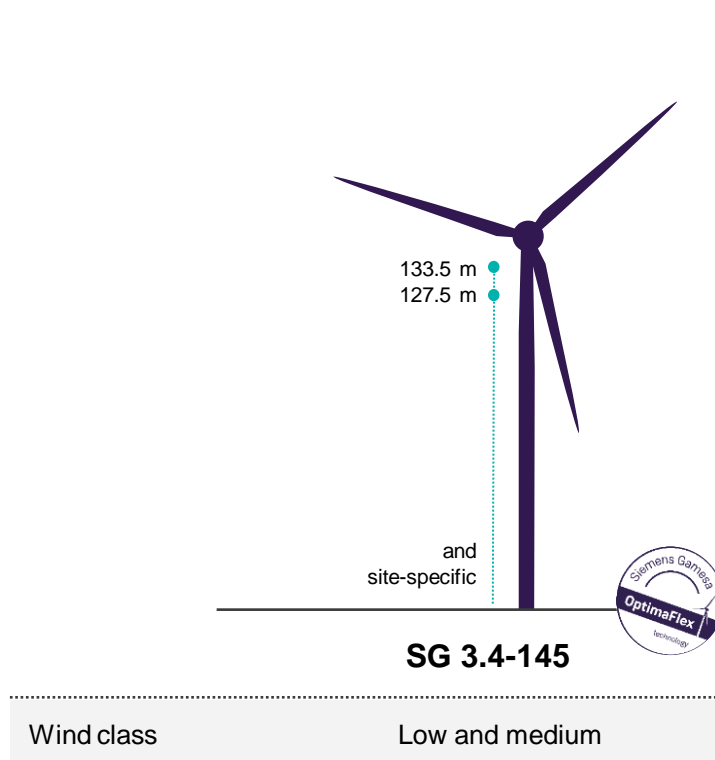


Siemens Gamesa 3.X



Siemens Gamesa 3.X

The lowest LCoE in the 3.0-3.6 MW segment



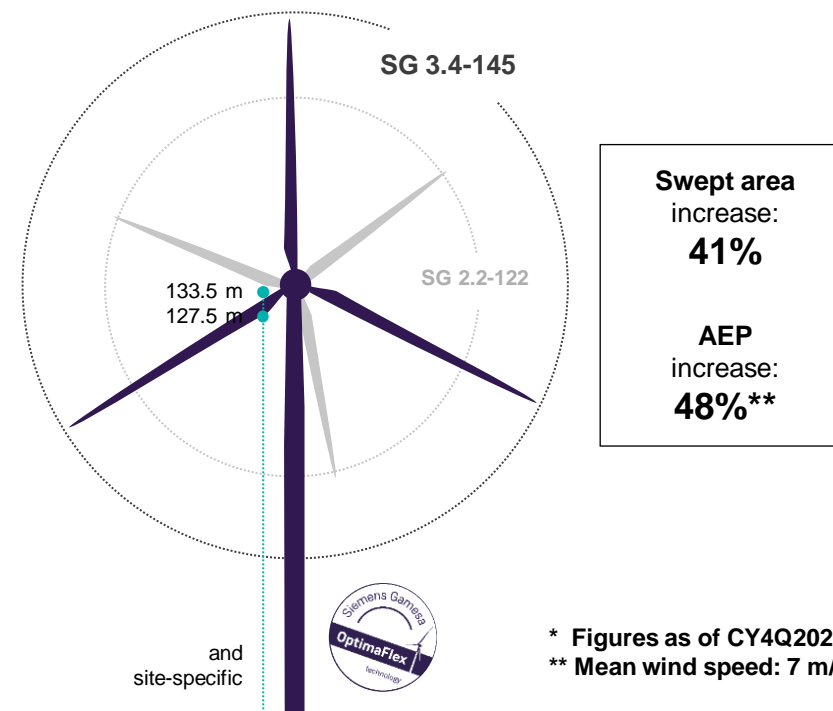
- A benchmark solution in one of the most competitive segments in the market.
- Natural evolution from the Siemens Gamesa 2.X solution.
- The lowest LCoE in the 3.0-3.6 MW segment.

Leveraging the proven experience of the Siemens Gamesa 2.X solutions

Siemens Gamesa 3.X

SG 3.4-145. Benchmark solution with high-capacity factor

- **Optimized LCoE:**
 - Design based on the certified **SG 3.4-132**, with more than 7 GW* installed and over 7 GW* in firm orders worldwide.
 - 71 m-blade based on the design of the Siemens Gamesa SG 5.0-145 blade.
- Optimized design for the low and medium wind conditions.
- Flexible power rating up to 3.6 MW.
- Almost 3 GW in firm orders and over 1 GW installed.



Key milestones

1Q2020

First prototype
in Spain

4Q2020

First nacelle
in India

4Q2020









RLMM Type
Certificate

2Q2021

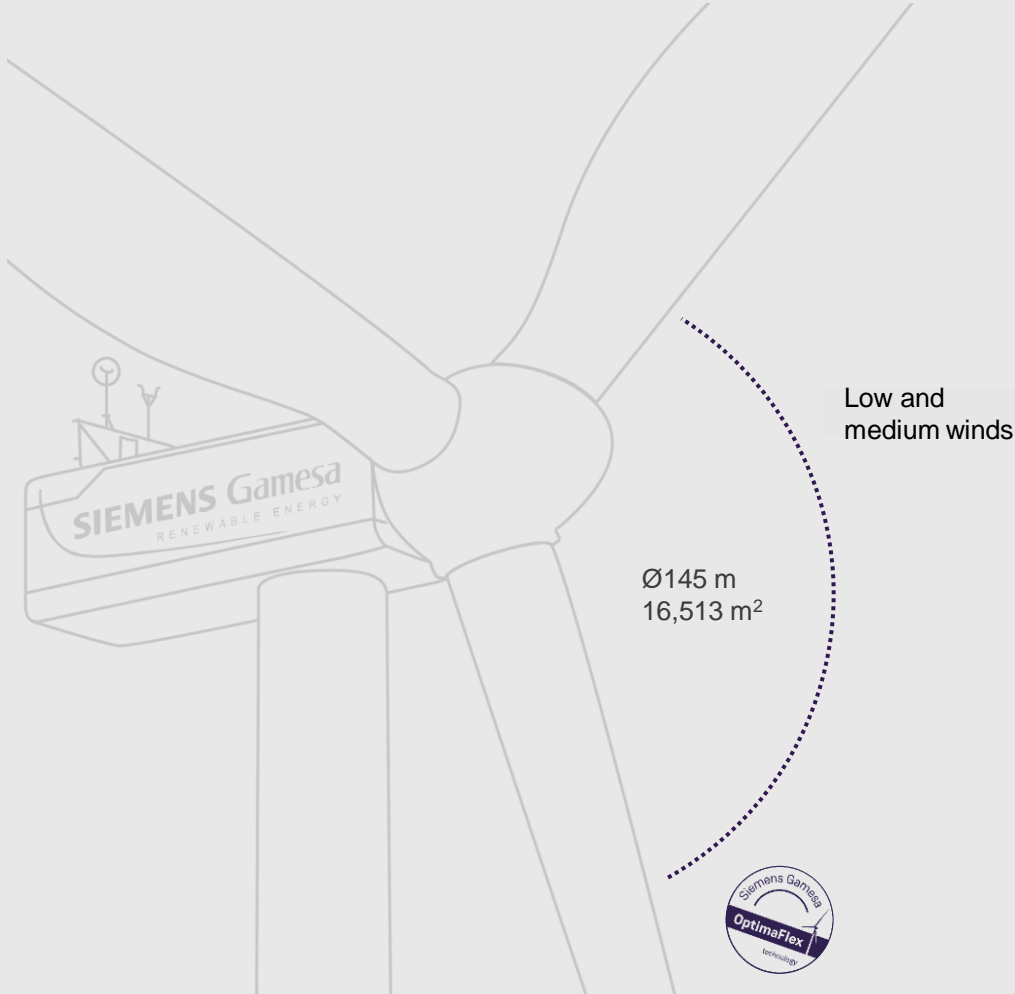
Start of
production

Siemens Gamesa 3.X

Product specifications

Main data		SG 3.4-145
	Rotor diameter	145 m
	Nominal power	3.465 MW (flexible power rating up to 3.6 MW)
	IEC class	III/S
	Generator output voltaje	690 Vac
	Power factor	0.95 CAP-0.95 IND throughout the power range ⁽¹⁾
	Grid frequency	50 Hz
	Standard temperature range*	From 0°C to 45°C (with de-rating)
	Noise emission level	108.8 dB(A)

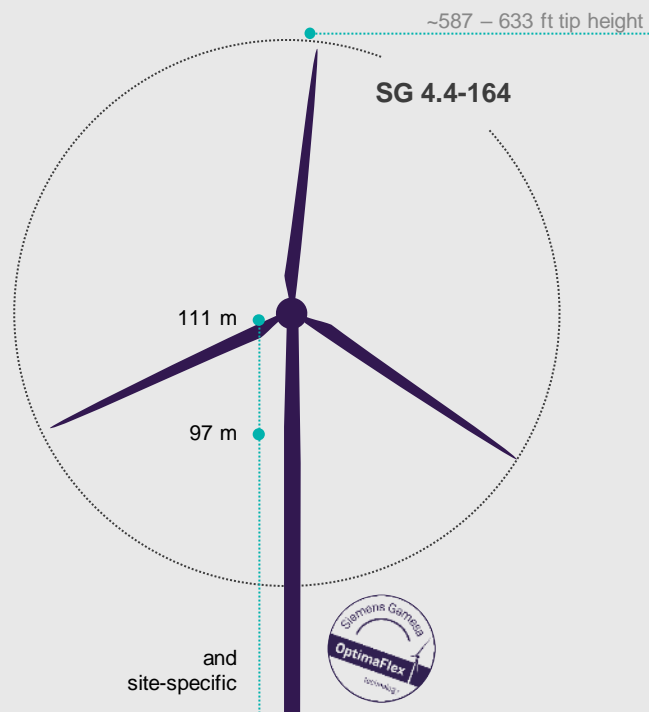
⁽¹⁾ Power factor at generator output terminals on lower side of MV transformer for baseline application mode.



Country-specific solutions

SG 4.4-164

Building America's energy future











The HNCF solution for the USA market

- **Enhanced blade aerodynamics**, designed by Siemens Gamesa's world-class blade design team in Boulder, CO.
- **Leveraging the established platform design** to minimize costs and streamline constructability.
- **High Net Capacity Factor** for maximizing performance and revenue.
- Designed for the U.S. market.
- Utilizes the manufacturing facilities in the U.S.

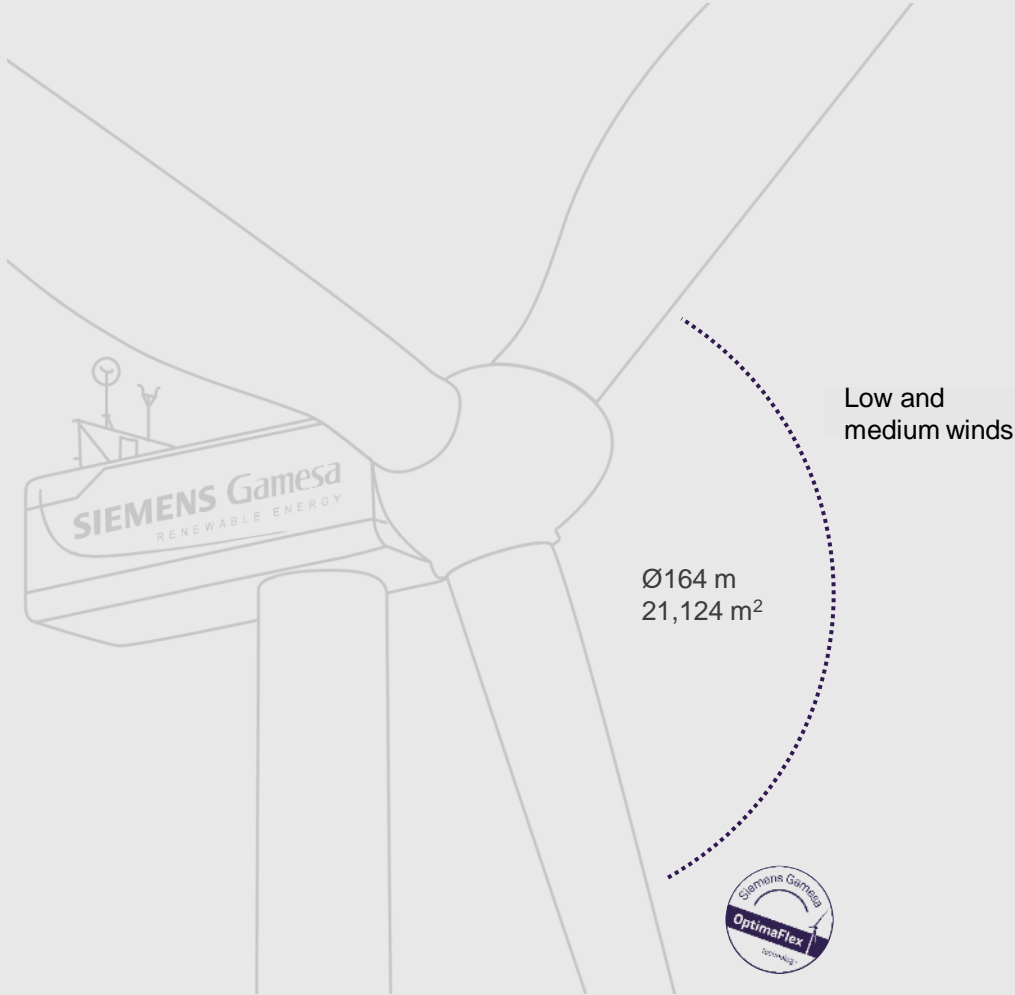
SG 4.4-164

Product specifications

Main data		SG 4.4-164
	Rotor diameter	164 m
	Nominal power	4.4 MW (flexible power rating 4.0-4.8 MW)
	IEC class	S
	Generator output voltaje	690 Vac +12%/-10%
	Power factor	$\pm 0.90 \cos \Phi$
	Grid frequency	60 Hz
	Standard temperature range*	[-20; +45°C] with temperature de-rating
	Noise emission level**	107 dB(A)

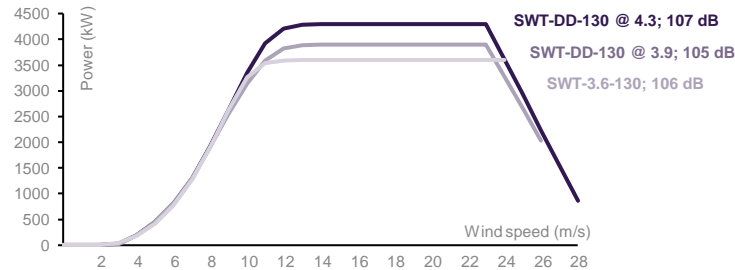
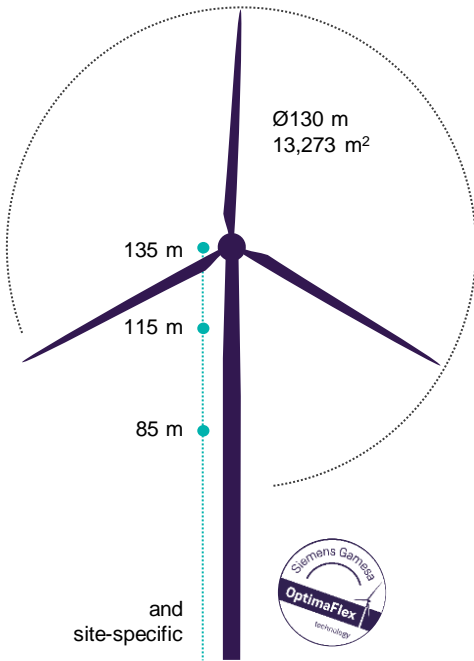
* Additional low temperature variant available.

** Lower noise modes available.

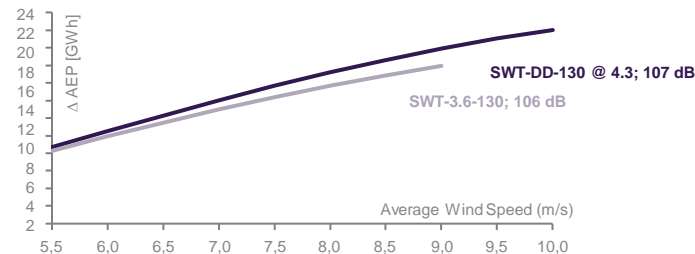


SWT-DD-130

~9% more AEP compared to the SWT-3.6-130



AEP increase: ~9%



- Available only for Japan.
- Full adaptability and optimized power for Class IB projects.
- Upgraded for typhoon class sites as METI conditions.
- Over 11.3 GW installation for direct drive turbines.
- Flexible rating strategy available with 3.55 MW to 4.3 MW.
- Maximum acoustic emission of 107 dBA.

* Figures as of CY4Q2023.

Key milestones

3Q2017

Official market launch (Husum)

4Q2017

First Prototype

1Q2018

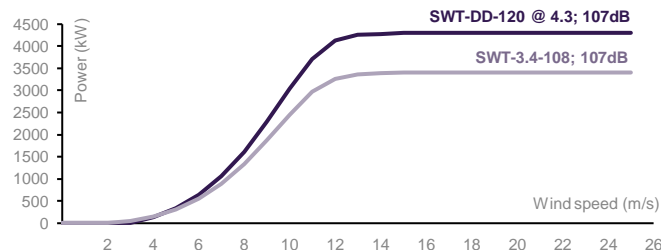
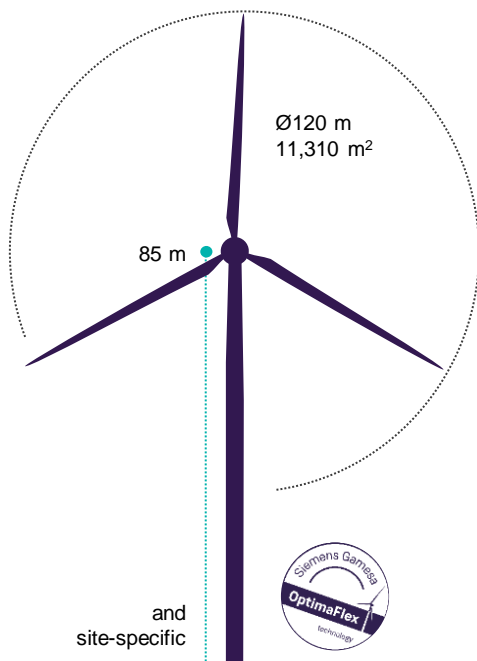
Prototype Certificate

4Q2018

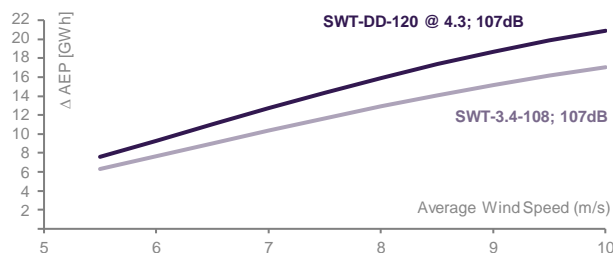
Type Certificate
Start of production

SWT-DD-120

The world's first Onshore 'Class T' turbine



AEP increase: ~23%



- Available only for Japan.
- Maximizing returns in high-wind conditions.
- Designed for typhoon class sites as METI conditions.
- Over 11.3 GW installation for direct drive turbines.
- Flexible rating strategy available with 3.9 MW to 4.3 MW.
- Maximum acoustic emission of 107 dBA.

* Figures as of CY4Q2023.

Key milestones

3Q2017

Official
market launch
(Husum)

2Q2018

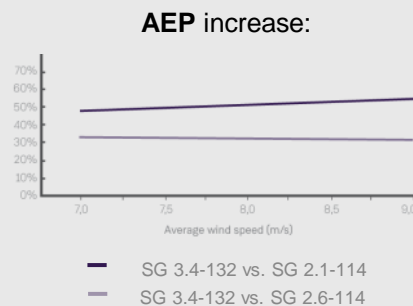
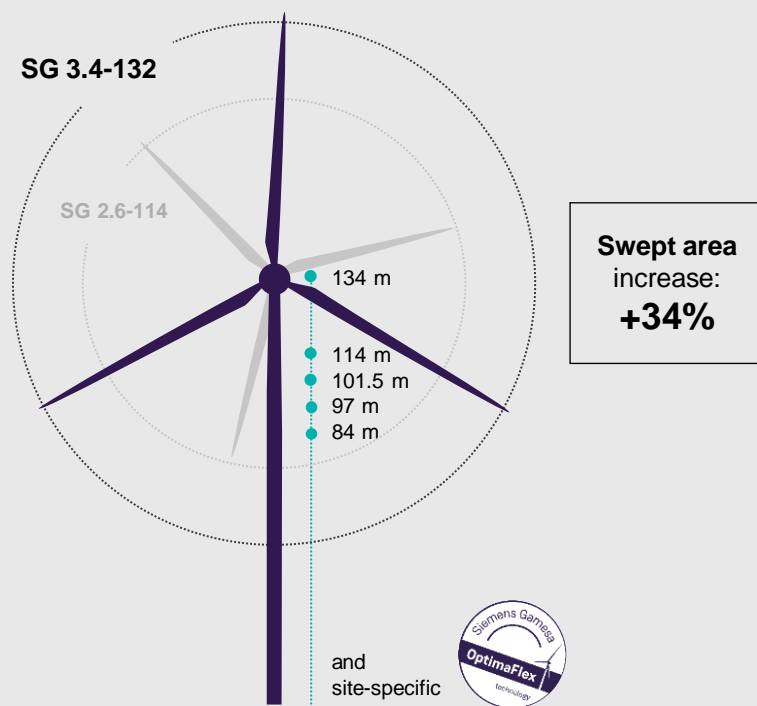
First Prototype
and Prototype
Certificate


1Q2019

IEC Type
Certification
Serial Production

SG 3.4-132

The 3 MW solution for the French market



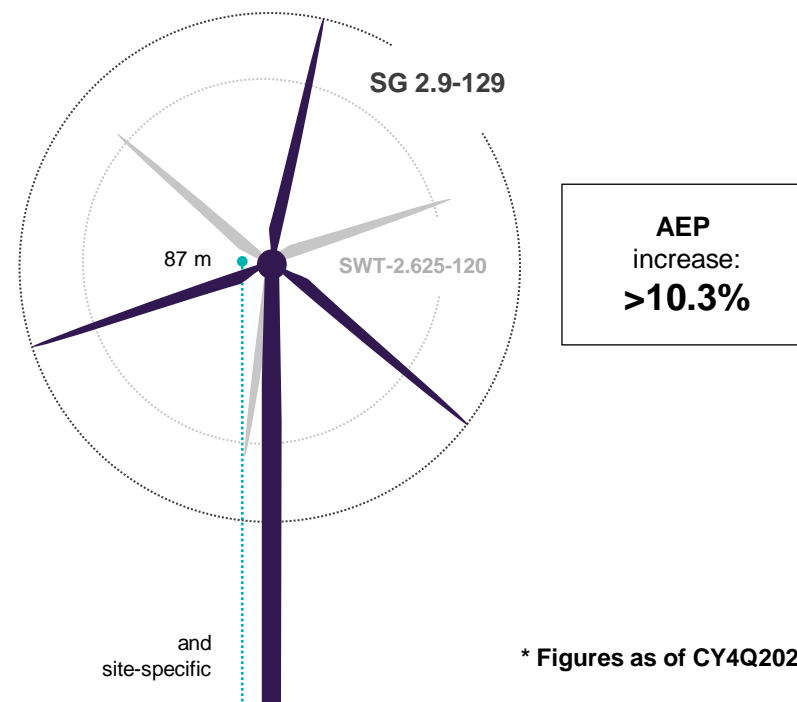
- 
- Designed for medium- and high-wind sites.
 - Based on the long track record Siemens Gamesa 3.X platform:
 - Same technologies adopted in the 2.1 MW and 2.6 MW solutions.
 - Flexible power rating from **3.0 MW to 3.75 MW**.
 - **Over 7 GW*** in firm orders.

* Figures as of CY4Q2023.

SG 2.9-129

Increased capacity factor for greater returns

- Available only for North America.
- Designed for medium- and low-wind sites, class S.
- Built on the foundation of the **proven 2.3 MW geared product series**, one of the most robust and successful turbine lines in the market. 11,212* units installed globally.
- Application Modes with power output up to 3.1 MW.
- **IntegralBlade® technology**, DinoTails® Next Generation, Vortex Generators and optimized cross-sections (airfoils) design.
- Based on **continuous innovation** and with a **25-year design lifetime**.
- Suitable for **repowering applications**.



* Figures as of CY4Q2023.

Key milestones

SG 2.7-129

2Q2018

Official
market launch

4Q2018

Prototype
operational

1Q2019

Type
Certificate

2Q2019

Serial
production

SG 2.9-129

2Q2020

Type
Certificate

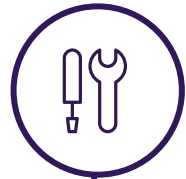
3Q2020

Start of
production

Service



Service is in our DNA



Service mindset

First OEM with a **dedicated** service organization with **digital backbone**.



Global reach with local focus

Active in **60 countries** organized in **5 regions** providing global access.



Track record

Strong track record 83.7 GW under service and **undisputable leadership in OF**.



Fleet expertise

Continuous development of **multibrand expertise**.

We never compromise on safety

Transparent reporting to drive down our Total Recordable Injury and Lost Time Injury Rates.

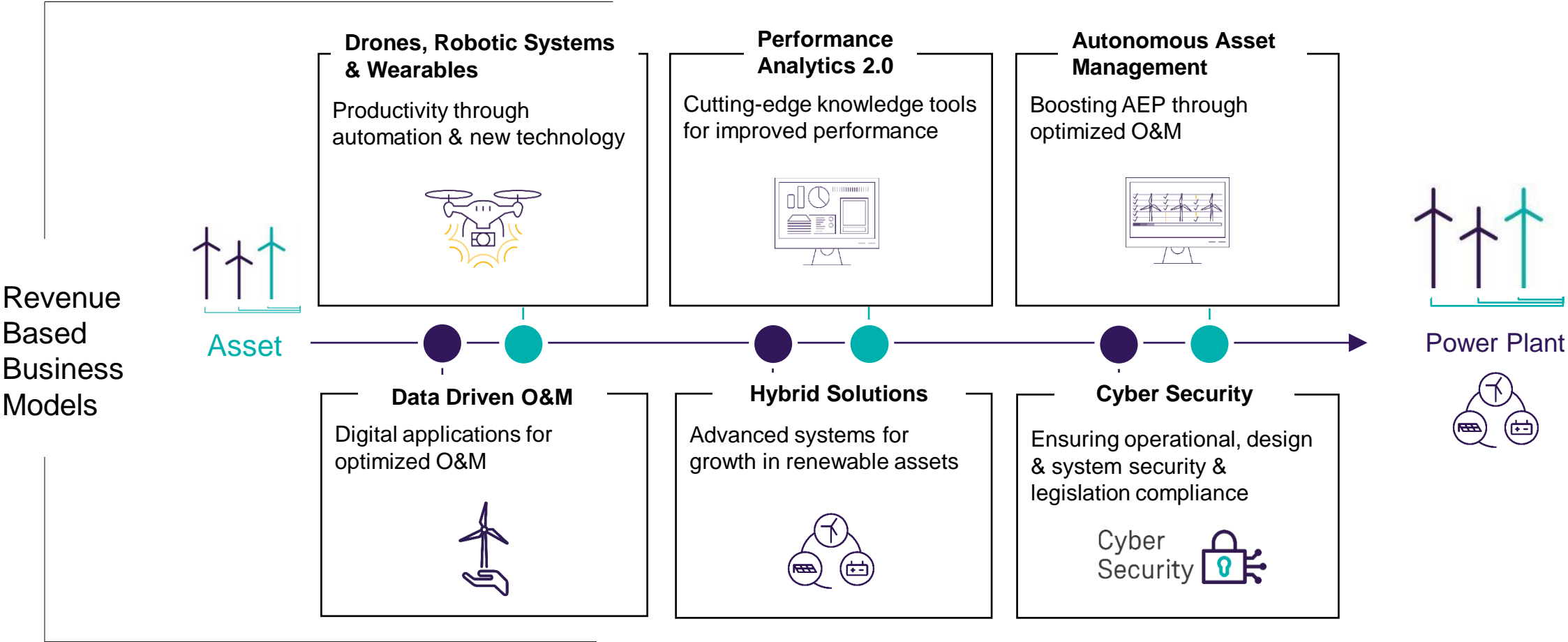
- Analysis of trends and areas for improvement.
- Incident investigations to prevent reoccurrence.
- Contractors included in all aspects of our safety performance.

Proactive control measures and education to deliver improved EHS performance.

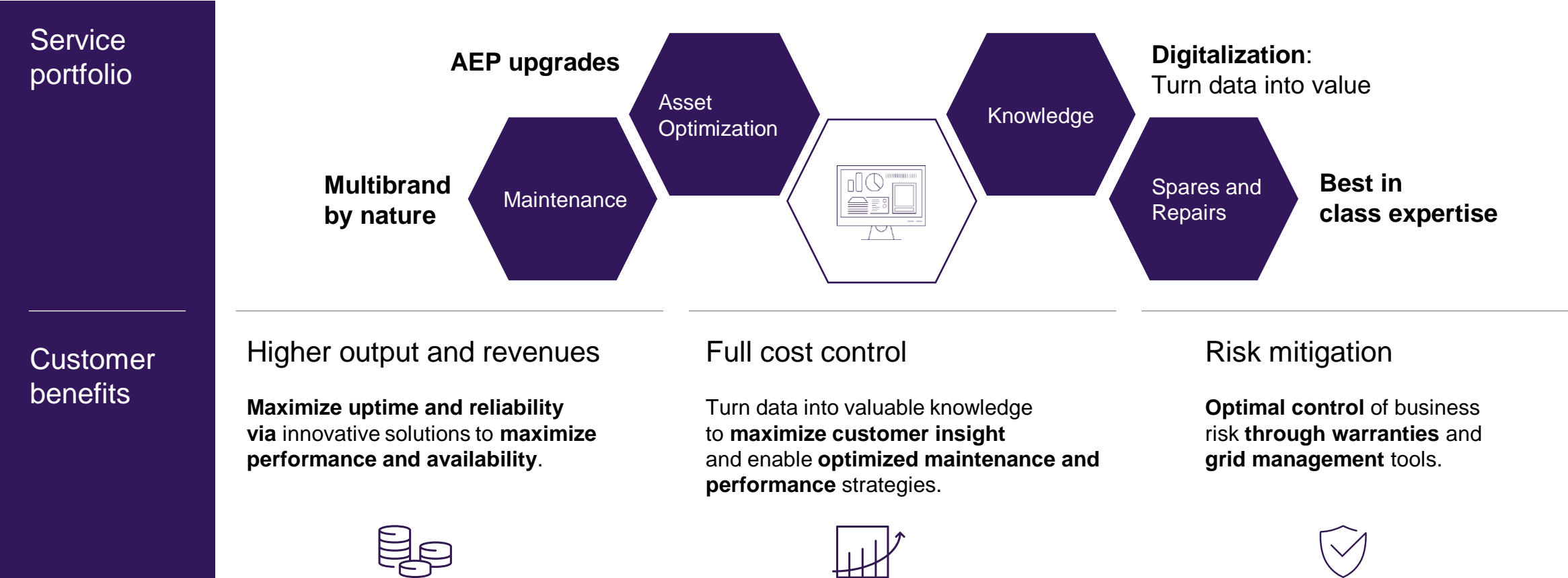
- Robust risk assessments to ensure safe operations.
- EHS programs based upon high-risk activities and operational control.
- Real world effective safety training.

Safety is
my choice

Innovation on asset and plant level as a key focus for Siemens Gamesa to drive performance and improve customer returns



Service established as strong lifetime partner towards the customer via a broad portfolio offering



Thank you

Disclaimer

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Contact us

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