



THE FUTURE OF WIND ENERGY IS HERE

Cypress Onshore Wind Turbine Platform

Setting new standards for onshore wind energy production and costs

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GE's Most Powerful Onshore Wind Turbine Gets Even More Powerful

Launched in 2017, the Cypress onshore wind platform has grown from an initial rating of 4.8 MW through to the latest 6.3 MW.

The Cypress platform advances the proven technology of GE's 2 MW and 3 MW fleets, which serves an installed base of more than 24.3 GW, while also using architecture and innovations from the 4.8-158 wind turbine introduced in 2017.

By early 2022, more than 7 GW of Cypress onshore wind turbines have been booked as firm orders.



CAN POWER **5,800**

EUROPEAN HOMES



UP TO **6.3 MW**

NAMEPLATE CAPACITY



+22 GWh

at 7.5 m/s avg



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Key features from the Cypress platform

Revolutionary two-piece wind turbine blade design



Significant AEP improvements



Condition Monitoring System (CMS)



More efficient services



REVOLUTIONARY TWO-PIECE WIND TURBINE BLADE DESIGN

The Cypress platform, which includes wind turbines with 158 and 164 meter rotor diameters, various hub heights, and power ratings between 4.8 and 6.1 MW, is equipped with both single piece and jointed blade variants, improving logistics and offering increased output from hard to reach sites. Longer wind turbine blades improve AEP and help drive down Levelized Cost of Electricity (LCOE), and the proprietary design will allow these larger onshore wind turbines to be installed in locations that were previously inaccessible.

This feature of the Cypress platform significantly drives down logistical costs by enabling blade assembly onsite and reduces the costs for permitting equipment and road work required for transporting longer blades. Equally important, the wind turbine features blade tips that offer customers greater flexibility to address site wind conditions and requirements.

The high-tech carbon blades were developed through the longtime partnership between GE's Onshore Wind business, GE's Global Research Center and GE's LM Wind Power, taking advantage of the research, design, and large-scale manufacturing expertise of these teams to bring the Cypress wind turbine blades from concept to a tested and proven reality.

Cypress onshore wind turbine - installation



Cypress onshore wind turbine platform

While installation of commercial units is peaking, GE is operating a second prototype in Denmark to continue strengthening quality and validating new configurations and components.

PRODUCT IMAGES



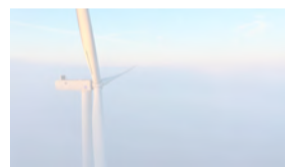
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Cypress platform image gallery



Cypress wind turbine prototype in Europe

[DOWNLOAD THIS IMAGE](#)



SPECIFICATIONS

Cypress wind turbine technical specifications

Cypress Platform	GE-158	GE-164
Power Output	4.8 MW to 6.3 MW variable rating	6.3 MW



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Cypress Platform	GE-158	GE-164
Hub heights	From 101 m to 161 m (and site specific)	From 112 m to 167 m (and site specific)
Frequency	50 to 60 Hz	50 Hz
IEC Class	S	
Noise-Reduced Operation	From 107 dB to 98 dB	
IEC Certification	Available	In Progress

Services



Services for onshore wind assets

We offer tiered levels of service offerings ranging from remote monitoring to fully maintaining your plant, as well as a wide range of performance-enhancing upgrades to keep your turbines running smoothly.

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Digital solutions for wind assets

A digital suite optimizing operations proven to meet evolving challenges, connecting operators with the information and insights to seamlessly drive action across their rapidly growing fleets

[Read more](#)

OUTCOMES

Customer success stories

Bavarian Rhapsody: GE receives first order for Cypress, the world's largest onshore wind turbine in operation


German onshore wind farm operator Prowind placed the first order for three of the Cypress 5 MW towering machines, each of which can generate enough electricity to power 5,000 European homes.

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Downloads & Related links

 [3 Things You Should Know About the 5.3-158 Wind Turbine](#)

 [Press Release: GE Launches Cypress Onshore Wind Platform, Designed to Grow, Adapt, Thrive and Lower the Cost of Electricity for Customers](#)

 [Press Release: GE's Largest Onshore Wind Turbine Prototype Installed and Operating In the Netherlands](#)

Related onshore wind products



3 MW Onshore Wind Platform

With shared drivetrain and electrical system architecture across all machines, GE's 3 MW onshore wind platform is adaptable to a full spectrum of wind regimes.

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01⁰⁷ AT A GLANCE



PERFORMANCE OUTPUT
SOUND-, POWER- AND LOAD-
MODES



HIGHER AEP
HIGHER AEP, HIGHER EFFICIENCY



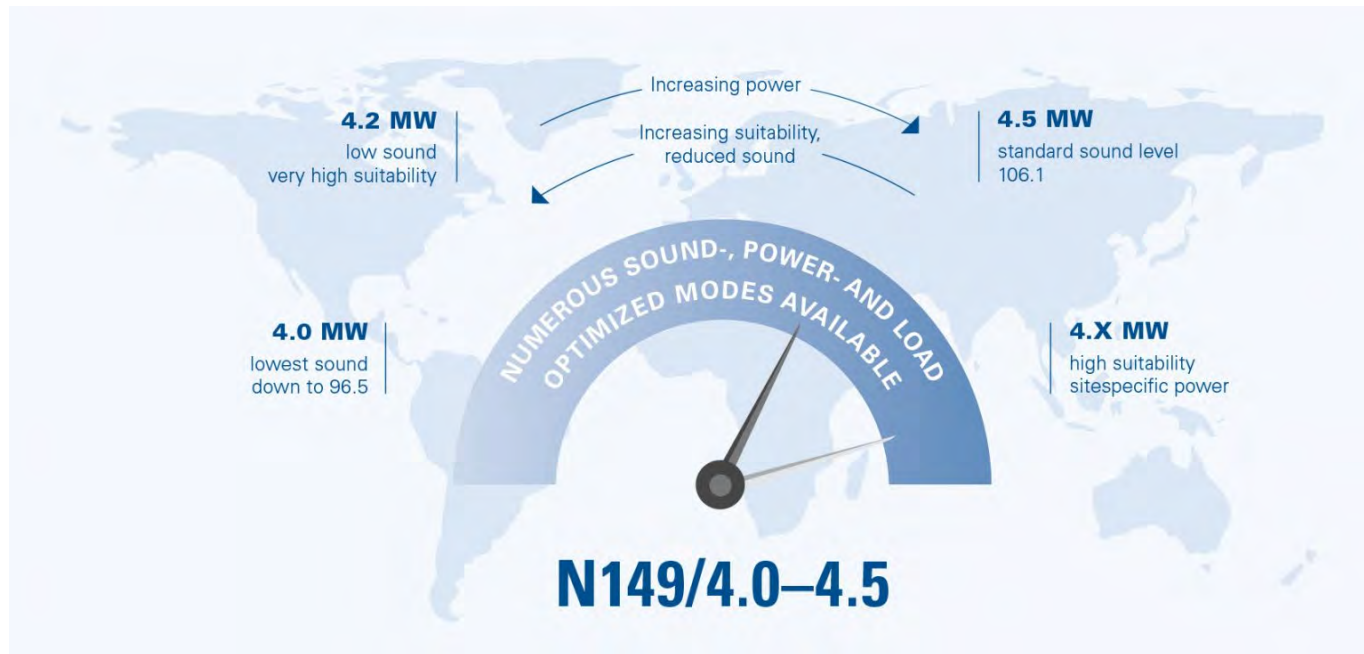
LESS SOUND, MORE POWER
106.1 dB(A) AT 4.5 MW

02⁰⁷ HIGHLY FLEXIBLE SITEABILITY

ADAPTABLE TO VARIOUS SITE CONDITIONS

With the N149/4.0–4.5, the Nordex Group was the first company to launch a turbine with a flexible rating as part of its core design philosophy and operation strategy. This design approach, combined with a variety of operating modes, enables the utilization of the N149/4.X across a large range of

projects – from medium wind projects in Australia to highly complex sites in Germany or Scandinavia.



03₀₇

DELTA4000 ARCHITECTURE CERTIFIED ON SITE



PROVEN TECHNOLOGY

The N149/4.0-4.5 prototypes were installed in the summer of 2018, meaning the main warranted performance figures, such as the power curve and most relevant sound power modes, have already been confirmed by measurements from certified third parties.

04₀₇

TECHNICAL DATA

Operating data

Rated power

4.0–4.5 MW (project specific up to 4.8 MW)

Cut-in wind speed

3 m/s

Cut-out wind speed

20 m/s (project specific up to 26 m/s)

Rotor

Diameter

149.1 m

Swept area

17,460 m²

Gearbox

Type

Type 3-stage (planetary-planetary-spur gear)

Generator

Construction

Double-fed asynchronous generator

Cooling system

Liquid/air cooling

Grid frequency

50/60 Hz

Brake system

Main brake

Aerodynamic brake (pitch)

Holding brake

Holding Brake Disc brake

Hub height

Hub height

up to 164 m, project – and sitespecific

05⁰⁷ THE STRATEGY- EVOLUTIONARY

CONNECTING PROVEN TECHNOLOGY WITH INNOVATIVE ENGINEERING

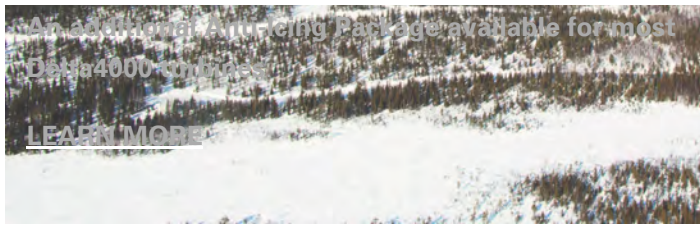
For the Delta4000 product series, we took over the Delta Generation's fundamental design and transferred it to the 4 MW, 5 MW and 6MW+ classes.

Depending on investment criteria of the customer's business case, the wind farm can be optimized with in terms of AEP, rating, lifetime and sound requirements. In addition, this flexibility offers opportunities to optimize the revenues in line with PPA structures and merchant price profiles.

1. OPTIMIZED POWER TRANSFER
2. LARGER ROTOR DIMENSIONS
3. REDUCED SERVICE EFFORTS
4. MAINTAINED ELECTRICAL SYSTEM
5. RELIABLE DRIVETRAIN CONCEPT
6. GRID COMPATIBILITY GUARANTEED

06⁰⁷ MORE ABOUT THE DELTA4000 SERIES





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07⁰⁷

EXPLORE THE DELTA4000 PORTFOLIO



N175/6.X

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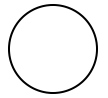
N163/5.X

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N163/6.X

[LEARN MORE](#)



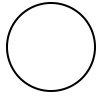
V150-4.5 MW™



4 MW brochure

The V150-4.5 MW™ is designed for low wind sites, and is one of the industry's highest producing onshore low wind turbines.





Building on the commercial success of the V150-4.2 MW™ for low wind conditions, the V150-4.5 MW™ captures higher park Annual Energy Production with an expanded global applicability.

Where permits allow, the higher rating variant delivers an over 3 percent increase in annual energy production compared to the V150-4.2 MW™, while maintaining the same application space and noise level.



Track Record



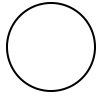
Vestas Service

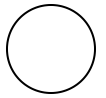


4 MW platform

Options available for the V150-4.5 MW™

- 4.5 MW Power Mode
 - Condition Monitoring System
 - Service Personnel Lift
 - Vestas Anti-Icing System™
 - Vestas Ice Detection
-
- Fire Suppression
 - Vestas Shadow Flicker Control System
 - Vestas Bat Protection System
 - Aviation Lights
 - Aviation Markings on the Blades
 - Vestas IntelliLight®





POWER REGULATION OPERATIONAL DATA

Pitch regulated with variable speed

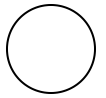
Rated power	4,500kW
Cut-in wind speed	3m/s
Cut-out wind speed	24,5m/s
Re cut-in wind speed	22,5m/s
Wind class	IEC S
Standard operating temperature range	from -30°C* to +45°C with de-rating above 23°C

SOUND POWER

Maximum	105.0 dB(A) Sound Optimised modes dependent on site and country
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ROTOR

Rotor diameter	150m
Swept area	17,671m ²
Aerodynamic brake	full blade feathering with 3 pitch cylinders



Height installed (incl. CoolerTop®)	8.4 m
Length	12.96 m
Width	3.98 m

ELECTRICAL

Frequency	50/60 Hz
Converter	full scale

GEARBOX

Type	two planetary stages and one helical stage
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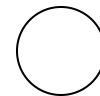
TOWER

Hub heights	Site and country specific
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HUB DIMENSIONS

Max. transport height	3.5m
Max. transport width	3.7m
Max. transport length	5.5m

BLADE DIMENSIONS



Max. chord

T.211

Max. weight per unit for transportation

70 metric tonnes

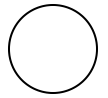
SUSTAINABILITY METRICS PENDING

4 MW

The Vestas 4 MW platform sets new standards for onshore wind performance within regimes ranging from very strong wind and typhoon conditions to ultra low wind.

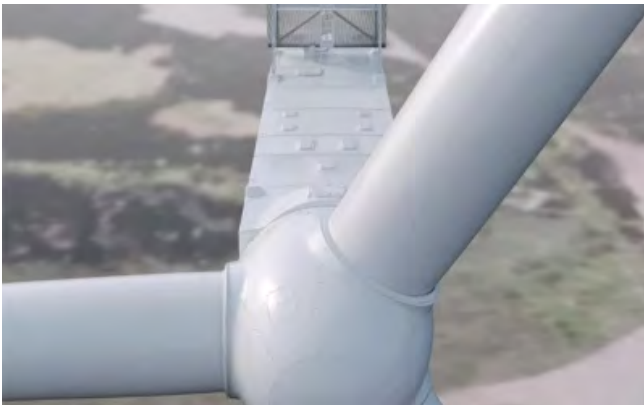
IEC S

The V150-4.5 MW™ IEC S is designed for low-wind sites.



The performance and versatility of the 4 MW platform has been proven with more than 61 GW installed in 57 countries since 2010.

Related wind turbines



V162-6.2 MW™

With a swept area of over 20,000m², the V162-6.2 MW™ applies the largest rotor size in the Vestas portfolio to achieve industry-leading energy production paired with a high capacity factor.

V150-6.0 MW™

The V150-6.0 MW™ lifts the larger rotor introduced with V150-4.2 MW™ into stronger wind speeds. Combined with its higher generator rating, it increases the production potential at turbine level by more than 20 percent compared to V150-4.2 MW™ in medium wind speed conditions.