THE FUTURE OF WIND ENERGY IS HERE

Cypress Onshore Wind Turbine Platform

Setting new standards for onshore wind energy production and costs

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

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

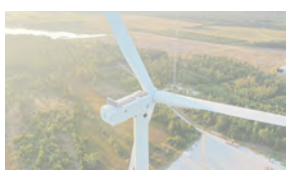
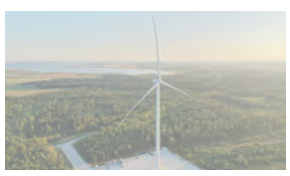
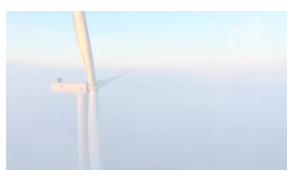
While installation of commercial units is peaking, GE is operating a second prototype in Denmark to continue strengthening quality and validating new configurations and components.

PRODUCT IMAGES

Cypress platform image gallery

Cypress wind turbine prototype in Europe

DOWNLOAD THIS IMAGE

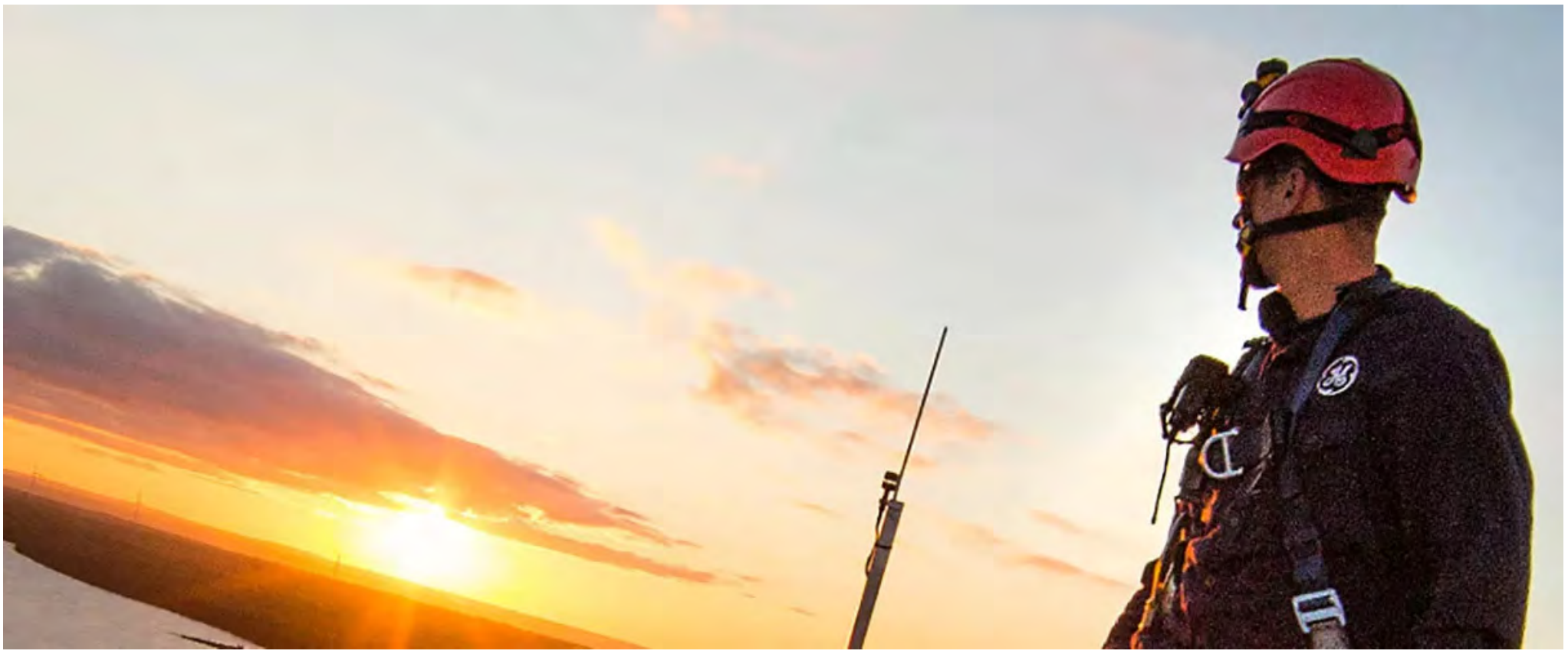
SPECIFICATIONS

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

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.

LEARN MORE

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.

READ MORE

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.

LEARN MORE

_01 07 AT A GLANCE

4 MW+

PERFORMANCE OUTPUT

SOUND-, POWER- AND LOAD-MODES

+28%

HIGHER AEP

HIGHER AEP, HIGHER EFFICIENCY

106.1 dB(A)

LESS SOUND, MORE POWER

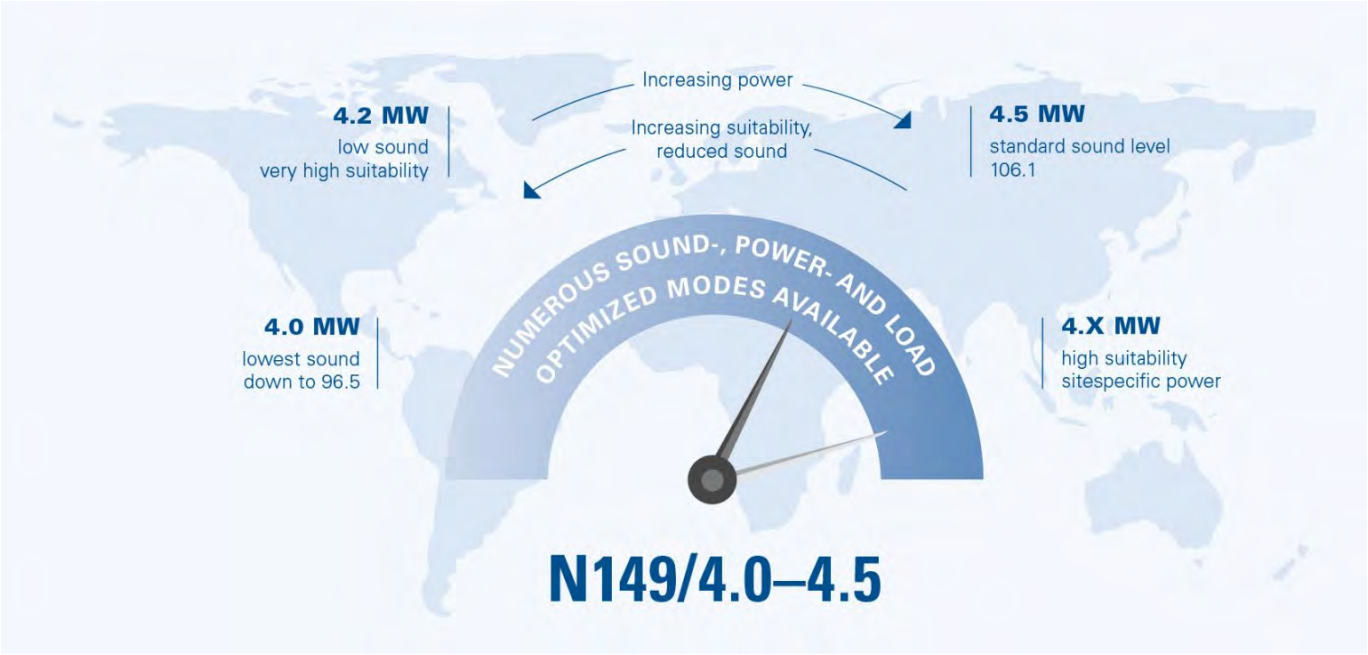
106.1 dB(A) AT 4.5 MW

_02 07 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.



_ 03 07
DELTA4000 ARCHITECTURE CERTIFIED ON SITE

As of October 2022

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.

_ 04 07

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

_05 07 THE STRATEGY- EVOLUTIONARY

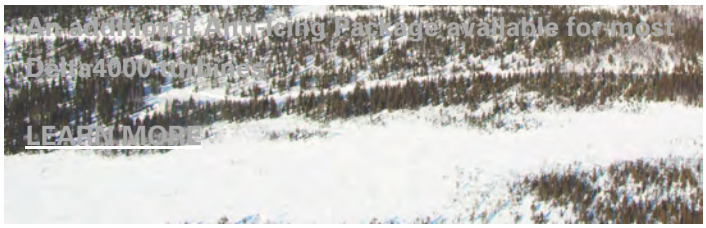
CONNECTING PROVEN TECHNOLOGY WITH INNOVATIVE ENGINEERING

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

_06 07 MORE ABOUT THE DELTA4000 SERIES



LEARN MORE

_07 07 EXPLORE THE DELTA4000 PORTFOLIO

N175/6.X

LEARN MORE

N163/5.X

LEARN MORE

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 InteliLight®

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

ROTOR

Rotor diameter	150m
Swept area	17,671m2
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

TOWER

Hub heights	Site and country specific

HUB DIMENSIONS

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

BLADE DIMENSIONS

Max. chord	4.2m
Max. weight per unit for transportation	70 metric tonnes

SUSTAINABILITY METRICS PENDING

4 MW

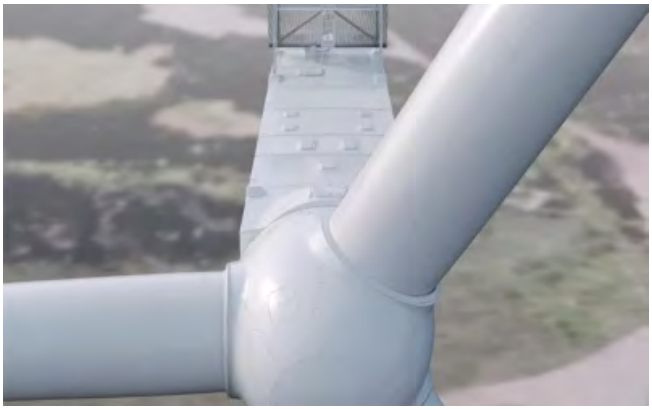
The Vestas 4 MW platform sets new standards for onshore wind performance within regimes ranging from very strong wind and typhoon conditions to ultra low wind.

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.