



Wind Turbine Manufacturers

an overview





Understanding Technical specifications

Each WTG manufacturer gives specifications for the different turbines. The first step in selecting a WTG is to compare these specs for different manufacturers and models.

As an example, we look at the Vestas V90-2.0 MW

Rotor

Diameter, D: 90 m

Area swept, A: 6,362 m² $= \pi \cdot D^2 / 4$

Nominal revolutions: 13.3 rpm $tip\ speed = \pi \cdot D \cdot rpm / 60 = 62.7\ m/s$

Operational interval: 8.8 - 14.9 rpm

Number of blades: 3

Power regulation: Pitch/Optispeed®

Air brake: Full blade pitch by three separate hydraulic pitch cylinders



Tower

Hub height: 80 - 95 - 105 m

Operational data

Cut-in wind speed: 3.5 m/s

Nominal wind speed: 12 m/s

Cut-out wind speed: 25 m/s

Generator

Type: IEC IIIA Asynchronous with OptiSpeed

Rated output: 2,000 kW

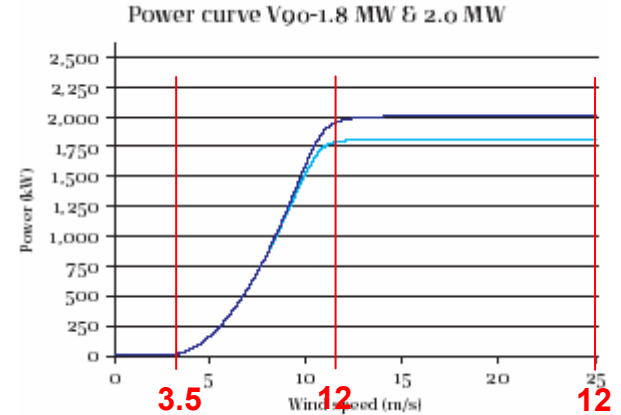
Operational data: 50 Hz/60 Hz, 690 V

Weight

Nacelle 68 t The house on top of the tower

Rotor 38 t Hub + blades

Tower, 80m 130 t





List of major manufactures

Vestas Wind Systems A/S

- **Stock Symbol:** Copenhagen : [VWS.CO](http://www.vestas.com)
- **Business type:** Vestas' principal activities are the development, manufacture, sale and maintenance of systems that use wind energy to generate electricity. Vestas supplies a full range of products, from individual turbines to the delivery of turnkey wind power systems.
- **Product types:** V52-850 kW, V80-1.8 MW, V80-2.0 MW, V82-1.65 MW, V90-1.8&2.0 MW, V90-3.0 MW..
- **Address:** Alsvej 21, 8900 Randers, Denmark
- **Telephone:** +45 97 30 00 00
- **FAX:** +45 97 30 00 01
- **Web Site:** <http://www.vestas.com>





Vestas main models

Model	Rotor diameter	Rated power	Hubheight
V82-1.65	82 m	1.65 MW	78 m
V90-2.0 MW	90 m	2.0 MW	80 m
V90-3.0 MW	90 m	3.0 MW	80-105 m

The V90-2.0 MW is designed for low-medium windy sites



 **ENERCON** ENERCON GmbH

- **Business type:** manufacturer
- **Product types:** windturbines from 300 kw - 1,8 MW.
- **Service types:** ENERCON SCADA
- **Address:** Dreekamp 5, 26605 Aurich, Germany
- **Telephone:** 0049 / 49 41 927-0
- **FAX:** 0049 / 49 41 927-109
- **Web Site:** <http://www.enercon.de>





Enercon main models

Enercon model	Rotor diameter	Rated power	Hubheight
E33	33.4 m	330 kW	44-50 m
E44	44 m	900 kW	55 m
E48	48 m	800 kW	50-76 m
E53	52.9 m	800 kW	73 m
E70	71 m	2.3 MW	58-113 m
E82	82 m	2.0 MW	78-138 m

The V90-2.0 MW is designed for low-medium windy sites



Siemens Wind Power (Earlier BONUS)

- **Business type:** Manufacturer
- **Product types:** Large wind powered electric generators. Range of wind turbines 1.3 MW, 2.3 MW and 3.6 MW.
- **Service types:** Maintenance, Research and development
- **Address:** Borupvej 16, 7330 Brande, Denmark
- **Telephone:** +45 99 42 22 22





Siemens main models

Model	Rotor diameter	Rated power	Hubheight
SWT 1.3-62	62 m	1.3 MW	45-68 m
SWT 2.3-93 (medium wind)	93 m	2.3 MW	70-80 m
SWT 3.6-107	107 m	3.6 MW	80m m



Nordex Energy GmbH

- **Business type:** manufacturer
- **Product types:** large wind powered electric generators, wind turbines 250 kW, 600 kW, 800 kW, 1000 kW, 1300 kW, 2500 kW.
- **Address:** C. F. Tietgens Vej 10, 6000 Kolding, Denmark
- **Telephone:** ++45 - 75 73 44 00
- **FAX:** ++45 - 75 73 41 47
- **Web Site:** <http://www.nordex-online.com>





Nordex' main models

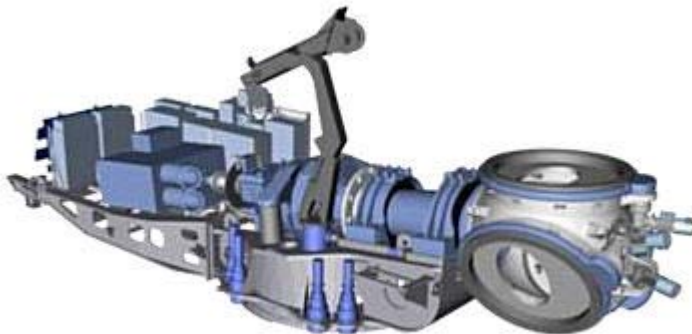
Model	Rotor diameter	Rated power	Hubheight
S70	70 m	1.5 MW	65-115 m
S77	77 m	1.5 MW	62-112 m
N80 (high wind)	80 m	2.5 MW	60-80 m
N90 (low wind)	90 m	2.3 MW	80-105 m
N100 (low-medium wind)	100 m	2.5 MW	100 m



Repower Systems AG

- **Business type:** manufacturer
- **Product types:** multi megawatt wind turbines from 1,5MW up to 5 MW.
- **Service types:** miscellaneous individual service packages
- **Address:** Alsterkrugchaussee 378, D-22335 Hamburg, Germany
- **Telephone:** +49 / (0)40/ 539307-0
- **FAX:** +49 / (0)40/ 539307-37

Web Site: <http://www.repower.de>





The complete list of WTG manufacturers can be found on :

<http://energy.sourceguides.com>

[/businesses/byP/wRP/lwindturbine/byB/mfg/byN/byName.shtml](http://energy.sourceguides.com/businesses/byP/wRP/lwindturbine/byB/mfg/byN/byName.shtml)



When selecting WTGs

1. Large rotor diameter and high tower for low wind sites
2. Get experienced assistance when negotiating the purchase contract
3. Accept only site specific power curves and performance warranties
4. Include OMS costs when comparing WTG offers
5. Make sure to have clear site specific wind and climatic conditions

That's it!