

ENDURANCE

YOUR  
CASH COW



# Highlights

## EXCELLENT SOLUTION FOR CONSIDERABLE ENERGY NEEDS

Endurance – is a true Cash Cow for farms, SMEs, and household communities. It is a 50 kW wind turbine system installed on a 24.0 or 36.5 meter stand-alone tubular tower.

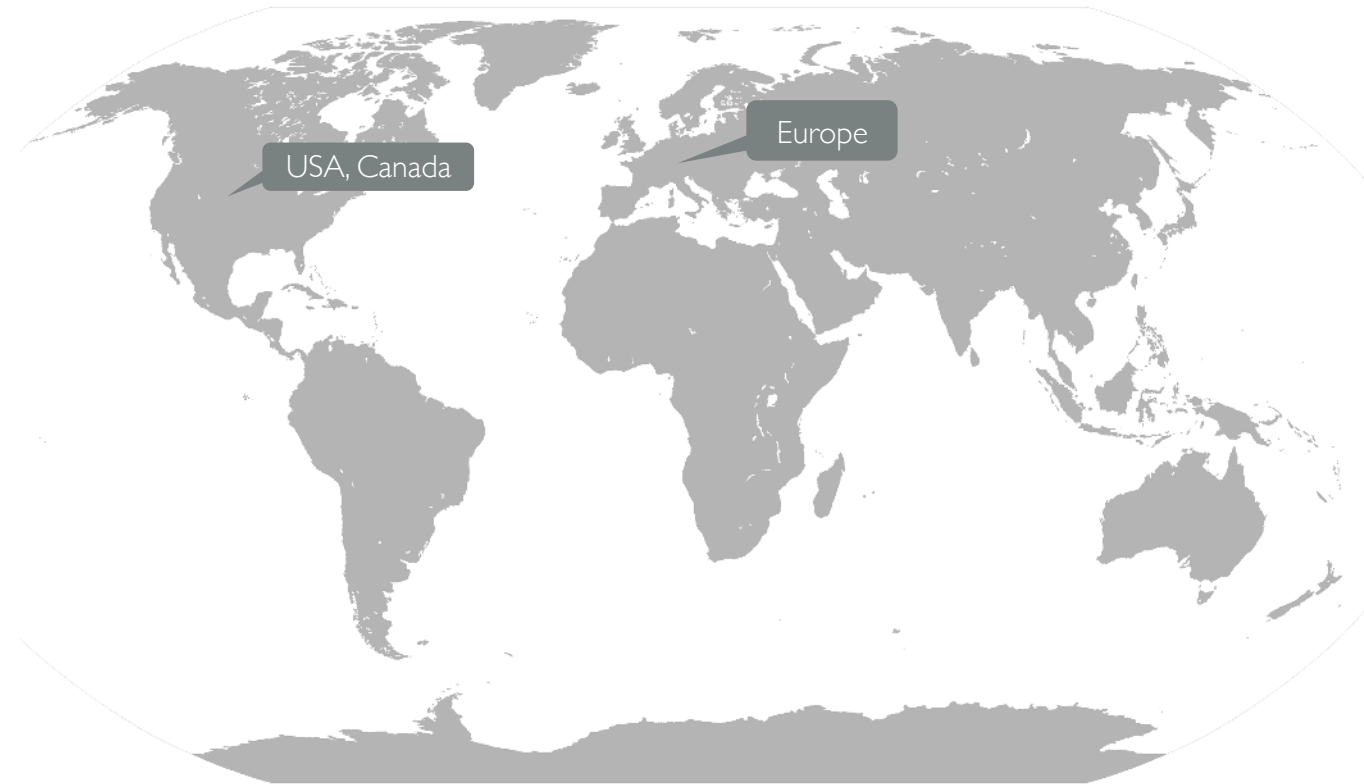
The solution provides the following benefits:

- Efficient design and superior performance: large swept area to capture maximum energy from the wind
- Simplicity: no need for external inverter for grid connection
- Reliability: validated through more than 500 installations worldwide
- Safety: control via Remote Monitoring System
- Quiet operation: slow turning blades and high-quality components
- Ease of installation and maintenance: one day is enough to complete the installation
- Five year warranty



# Installed Base

Validated through an international installed base with more than 500 installations



# Installation Examples



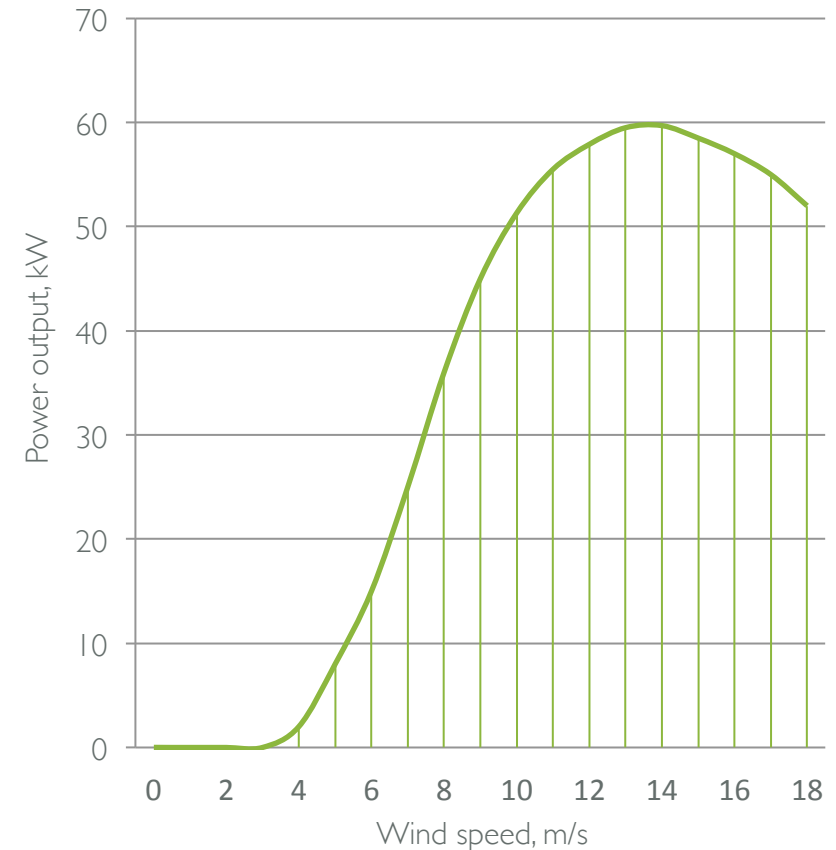




# Technical Specifications

Rated power output	50 kW at 9,5 m/s
Annual energy yield	1 68 900 kWh* at 6 m/s
Rotor diameter / Swept area	19 m / 290 m <sup>2</sup>
Number of blades / Type	3 / Downwind
Blade material	Fiber glass-epoxy blades
Generator type	ABB Asynchronous 3-phase 480V - 50 Hz
Expected lifetime	20 years design life
Rated wind speed	9,5 m/s
Cut-in wind speed	3,5 m/s
Cut-out wind speed	25 m/s
Survival wind speed	52 m/s
Fixed Rotating speed	42 rpm
Main brake system	Pitch control system (for over-speed regulation) using passive, spring-loaded mechanism
Secondary safety mechanism	Rapid fail-safe dual mechanical brakes
Grid Feeding	Complies with EU grid regulations
Turbine weight	3990 kg (complete nacelle)
Noise level at 6m/s	40 dB(A) at 120 m
Warranty	5 years

## Power Curve



\* The figures are given for reference only and are no guarantee of the indicated annual energy yield.

# Energy Production

## Production Efficiency

Most distributed wind customers did not select their site for wind resources, but look to generate power from the wind available to them. Endurance wind turbines are designed specifically for less-than-perfect wind conditions

### Swept Area

The blades capture the energy of the wind. The larger the rotor diameter, the more wind energy the turbine captures. The Endurance rotor diameter - one of the largest rotor diameters per rated kW in its class - to capture the most of wind energy.

### Motoring

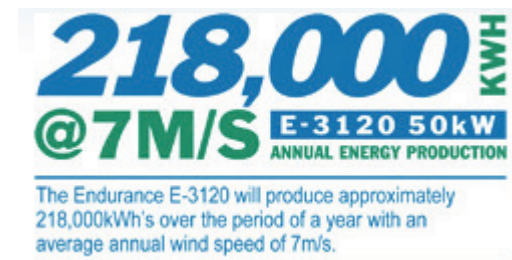
Motoring starts the blades spinning so the turbine operates in lighter wind conditions than if it relied solely on the wind to start (3-phase models only).

### Generator Type

The induction generator produces electricity that can be transferred to the power grid without inverters.

This provides lower equipment and maintenance costs and increases overall power production.

Average Wind Speed (m/s)	Annual Energy Production (kWh)
4.0	62 500
5.0	114 900
6.0	168 900
7.0	218 000
8.0	257 200





# Quiet Operation

Quiet operation is essential for a wind turbine in a community environment. Endurance turbines use slowly turning blades and high-quality manufactured components to make them the quietest turbines in their class.

Distance from turbine	Noise level*	Equivalent
20 m	50 dB(A)	Average household
65 m	44 dB(A)	Background sound of wind
110 m	40 dB(A)	Quiet library
144 m	Turbine cannot be heard	-

\* - Measured at 5m/s wind speed

# Endurance Installation Scale Size



# Interested? Contact us!

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