ENO 92

2.2 MW

enovation for efficiency

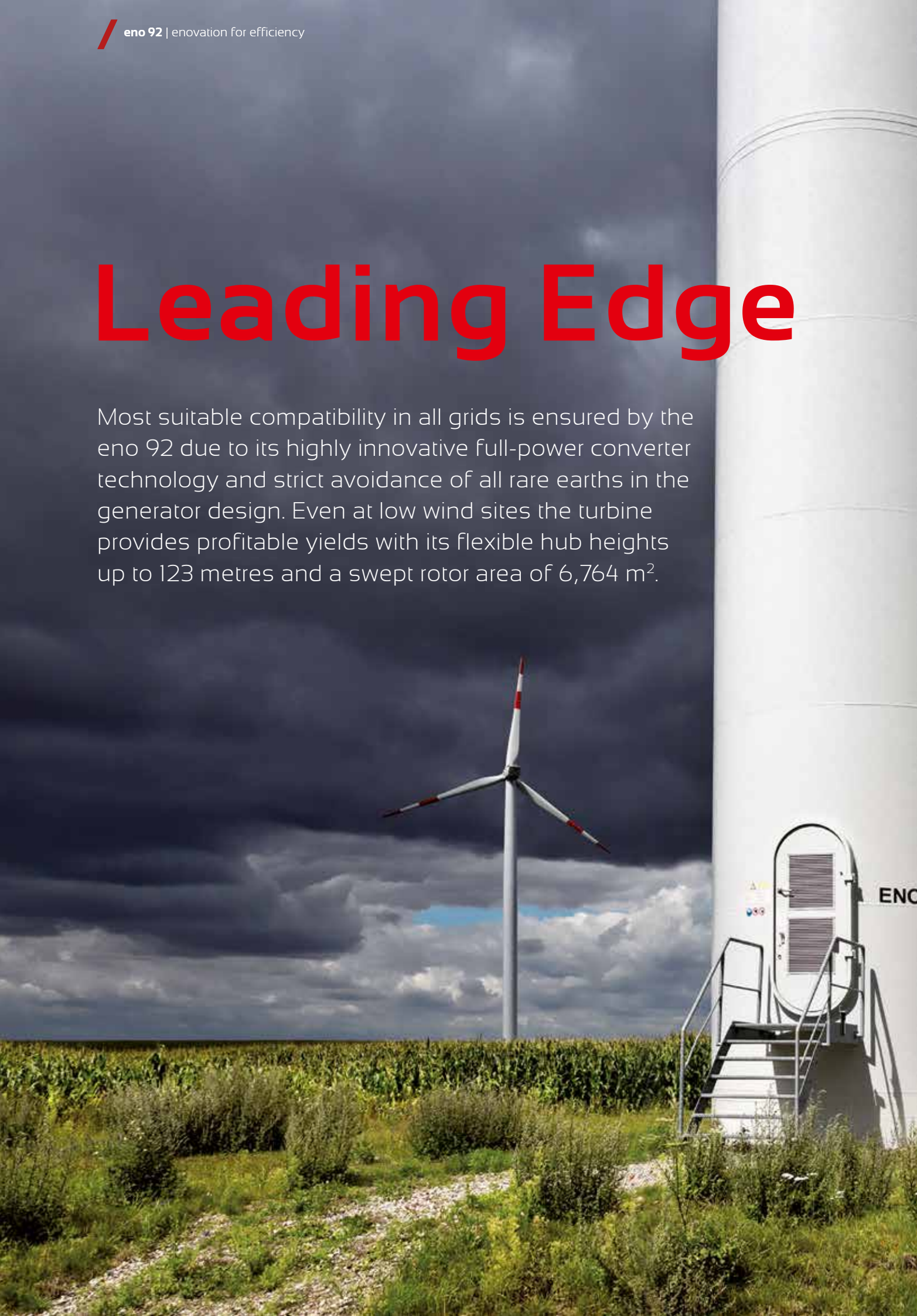
ENO ENERGY

Success with wind.

www.eno-energy.com

Leading Edge

Most suitable compatibility in all grids is ensured by the eno 92 due to its highly innovative full-power converter technology and strict avoidance of all rare earths in the generator design. Even at low wind sites the turbine provides profitable yields with its flexible hub heights up to 123 metres and a swept rotor area of 6,764 m^2.



Optimised efficiency at low wind speeds

Full flexibility

The eno 92 combined an intelligent pitch control and tower heights up to 123 metres for a maximum wind harvest even at low to medium wind sites. A comprehensive option package for ice, noise and feed-in management extends additionally the operational area. Moreover, the wind turbine meets the most demanding, international grid connection requirements and can be used worldwide.

High availability

The **eno live.train®** concept guarantees the maximum reliability and durability for all drive train components. The adaptive drive train damping based on the 3MW class and the grid decoupling by full-power converter technology protect the gearbox optimally against alternating loads. A redundant configuration of lubrication, cooling and converter systems ensure full operability of the turbine even at a subsystem failure.

Excellent grid characteristics

With its well proven combination of a brushless synchronous generator and a full-power converter the eno 92 handles grid faults smoothly and reliably. The wide reactive-power range underlines the excellent grid compatibility of the turbine regarding flicker and harmonics without a need of any additional filters or compensation systems. With these characteristics the eno 92 can easily meet all standard grid connection requirements.

Complete service

Undisturbed power generation, high productivity and reliable yields: To ensure these benefits sustainably eno energy offers a comprehensive service and after-sales programme. The flexible full-maintenance concept – **eno complete.care®** – provides for permanent supervision of the machines, including condition monitoring. Highly qualified on-site service technicians ensure smooth and trouble-free operation of the wind farm. In this way the operating costs can be calculated for long term. Thus, the availability is guaranteed at a high level.

eno pitch.control®
Safety meets efficiency

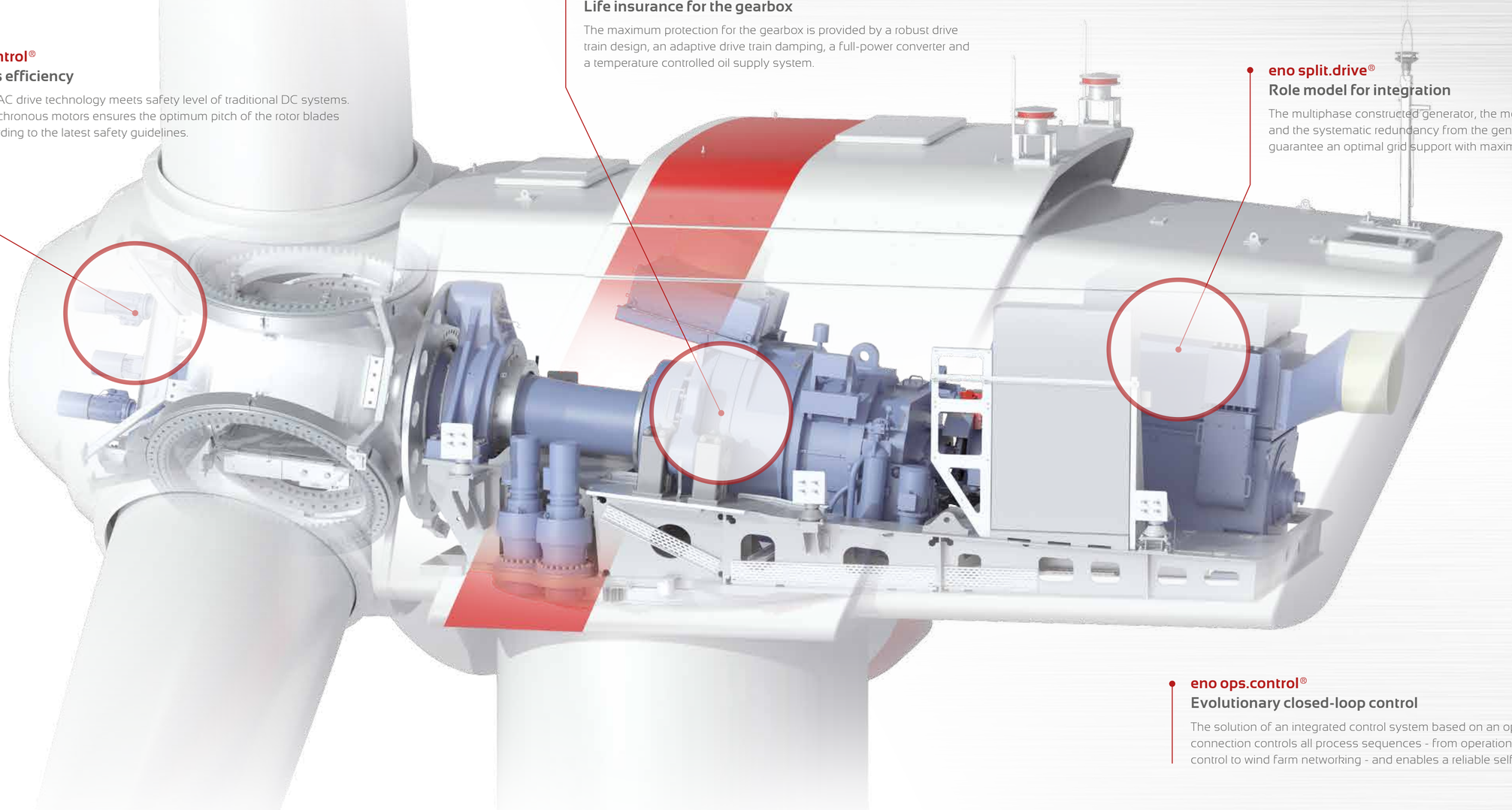
State-of-the-art AC drive technology meets safety level of traditional DC systems. The robust asynchronous motors ensures the optimum pitch of the rotor blades at all times according to the latest safety guidelines.

eno live.train®
Life insurance for the gearbox

The maximum protection for the gearbox is provided by a robust drive train design, an adaptive drive train damping, a full-power converter and a temperature controlled oil supply system.

eno split.drive®
Role model for integration

The multiphase constructed generator, the modular converter system and the systematic redundancy from the generator winding to the converter guarantee an optimal grid support with maximum availability.



eno ops.control®
Evolutionary closed-loop control

The solution of an integrated control system based on an open, web-based SCADA connection controls all process sequences - from operational management via pitch control to wind farm networking - and enables a reliable self-optimisation.

High reliability and efficiency

Technical specifications eno 92

General

Type	eno 92
Rated Power	2,200 kW
Cut-in wind speed	3 m/s
Rated wind speed	13 m/s
Cut-out wind speed	25 m/s
Tilt angle	5°

Rotor

Diameter	92.8 m
Nominal speed range	5.5 - 14.8 rpm
Swept area	6,764 m²

Rotor blade

Manufacturer	LM Wind Power
Material	GRP
Length	45.3 m

Gears

Model	Planetary-/spur gearing
Gear ratio	approx. 1:111

Generator

Type	Synchronous generator
Design	slip ringless / brushless excitation

Tower (hub height)

Type Tubular steel	103 m, 123 m

Converter

Type	Full power converter
Model	Modular IGBT inverter topology

Sound power level

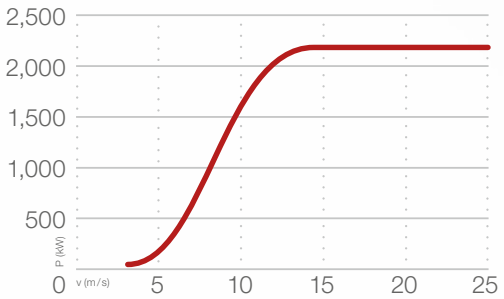
calculated (Mode 0)[1]	104.8 dB(A)

Wind class

Wind class according to IEC	IEC IIIa
Wind zone according to DIBt	WZ II

[1] noise-reduced operation modes available on request

Power curve eno 92



Estimated annual energy yield

v_{w}, hub height	eno 92
5.0 m/s	3,301 MWh/a
5.5 m/s	4,208 MWh/a
6.0 m/s	5,139 MWh/a
6.5 m/s	6,065 MWh/a
7.0 m/s	6,963 MWh/a
7.5 m/s	7,817 MWh/a

Evaluation of reference yield according to FGW TR 5

Hub height	Reference yield in kWh
103 m	32 162 569
123 m	33 698 504

Efficient wind farms. For a clean future.

It is our goal to make wind energy more efficient. Economic success of renewable energies and growing importance of climate protection go hand in hand. eno energy has already planned and installed a large number of wind farms all over Europe. With this experience we design the 2 and 3.5 MW platform to achieve maximum output out of the wind farm. Therefore we offer the most efficient solution for each location.

Contact: sales@eno-energy.com

eno 82	eno 92	eno 100	eno 114	eno 126
2.05 MW IEC IIa	2.2 MW IEC IIIa	2.2 MW IEC IIIa	3.5 MW IEC IIs	3.5 MW IEC IIIs

eno energy systems GmbH
Am Strande 2 e . 18055 Rostock . Germany
phone: +49 (0)381 . 20 37 92-0
fax: +49 (0)381 . 20 37 92-101
mail: sales@eno-energy.com
www.eno-energy.com

ENO ENERGY
Success with wind.