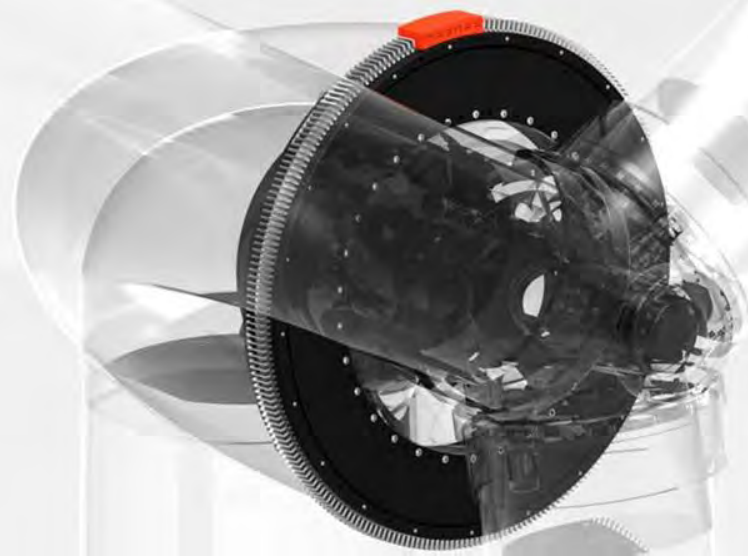




MAGNAX

NEXT-GEN
YOKELESS AXIAL FLUX
MOTOR / GENERATOR
TECHNOLOGY



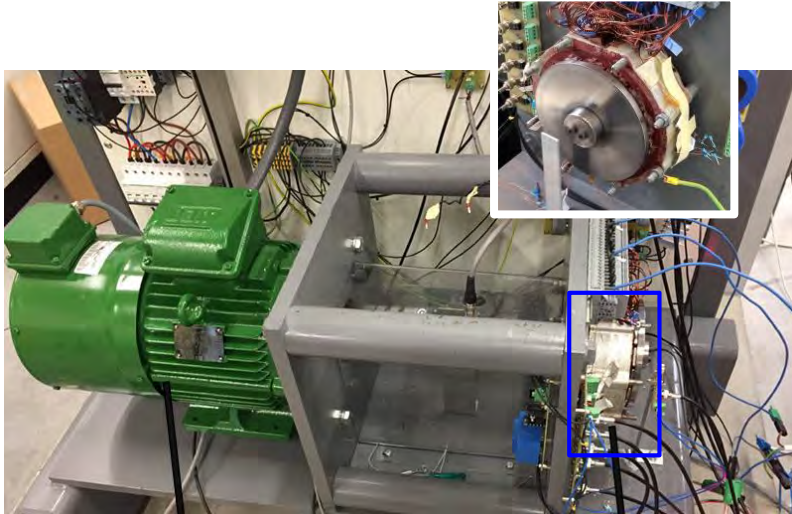
Who is Magnax

- Startup based in Kortrijk, Belgium
- Founded by Peter Leijnen, Daan Moreels and Kester Goh
- Collaboration with Ghent University who has been researching axial flux technology since 2008
- Thyssenkrupp ES partnership
- **Magnax mission: Magnax enables industrial innovation with direct-drive motor- and generator technology that outperforms in efficiency, weight, reliability, and cost-effectiveness.**

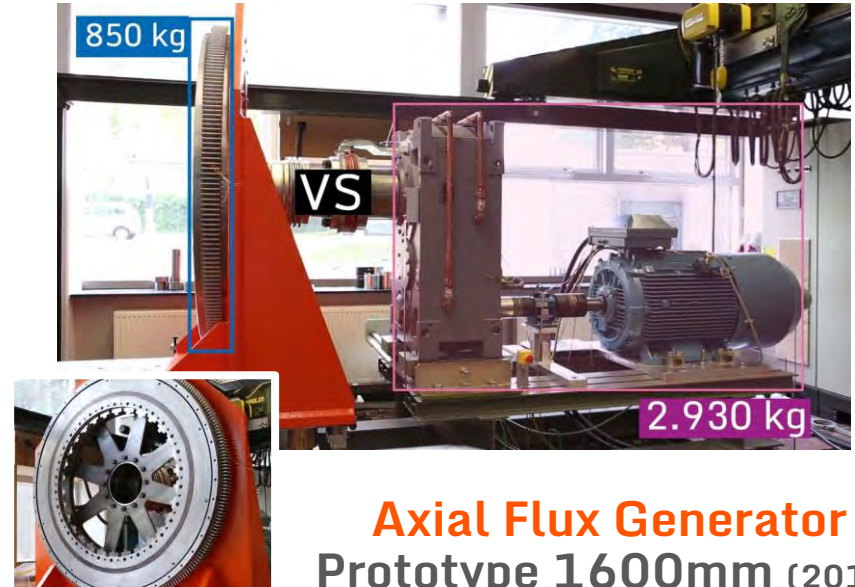


Evolis 100 | 8500 Kortrijk | BELGIUM

Axial Flux vs. Traditional Motor/Generator



Axial Flux Motor
Prototype 170mm (2016)
E-Vehicle Motor



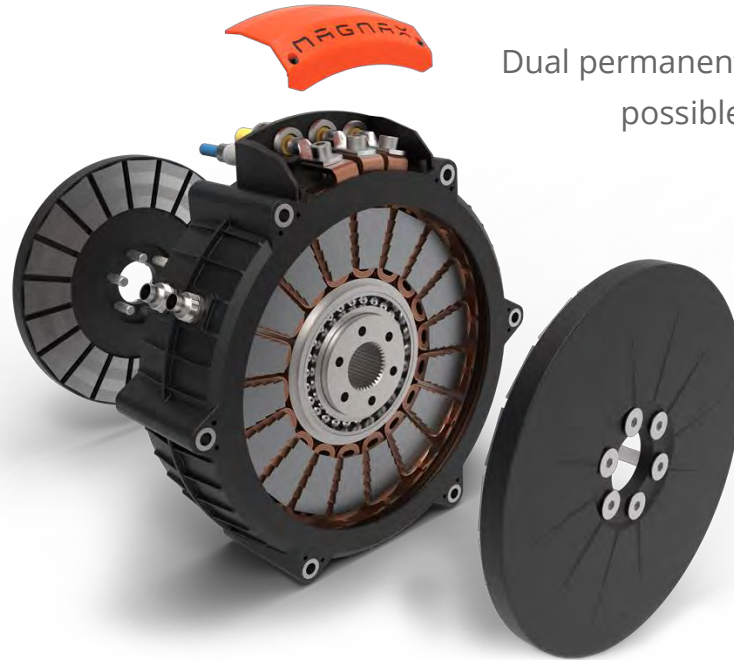
Axial Flux Generator
Prototype 1600mm (2017)
Wind Turbine Generator

Technical differentiators

A patented system for cooling the windings, for the lowest possible stator temperatures

Rectangular section copper wire, for the highest possible copper fill factor (90%)

Concentrated windings, for the lowest possible copper losses (no coil overhangs)



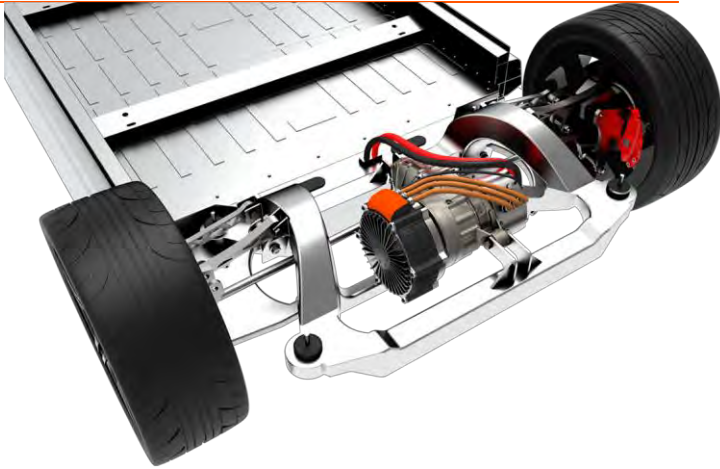
Dual permanent magnet rotors, for the highest possible torque-to-weight ratio

Yokeless stator, for the shortest possible flux paths and a lower overall weight

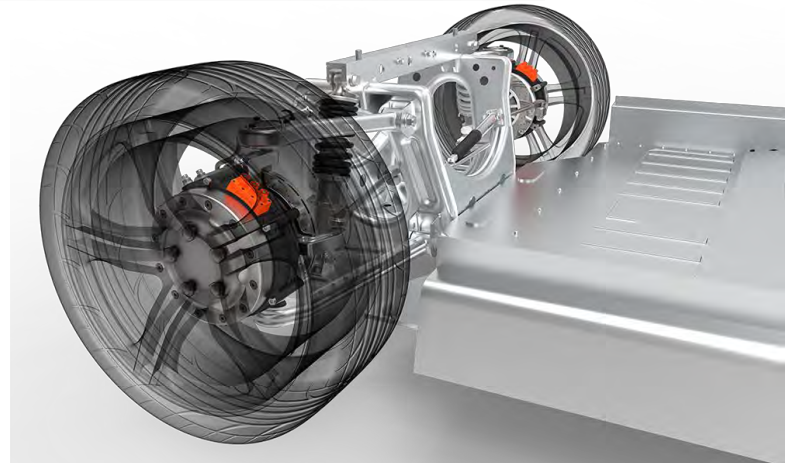
Grain-oriented electrical steel, lowering the core losses by as much as 85%



E-mobility Market



- Motors from 185 mm (8 kg) to 355 mm (40 kg)
- From 100 kW to 400-kW peak power
- In-wheel or chassis mounted, inrunner or outrunner
- Torque densities: 25 - 30 Nm/kg, Power densities: up to 15 kW/kg
- Highly scalable, produced with standard production processes

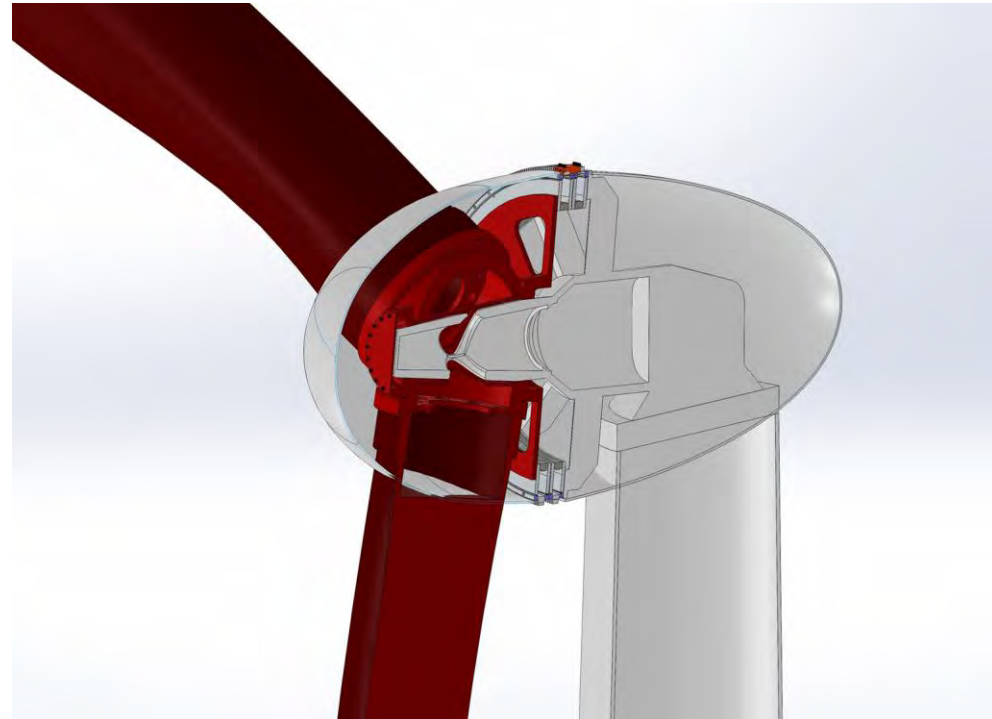


Wind Turbine / Wave Energy Market



Stacking:
3x Magnax Axial Flux
Generator Disc

- Generator weight reduced with factor 2 to 4
- Lower cost (less magnet material, steel, etc..), limited labor cost thanks to pre-fabricated cores
- Stacking of generator discs adds flexibility and standardization
- Efficiency 3% to 8% higher (>96%)



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