

Reference Report:

Electrified-Aircraft-Tractor: GOLDHOFER »PHOENIX« E



Goldhofer

Key facts:

- Up to 352 t towed weight
- Pure battery with varying capacity
- Silent operation, emission-free
- Range extender as option

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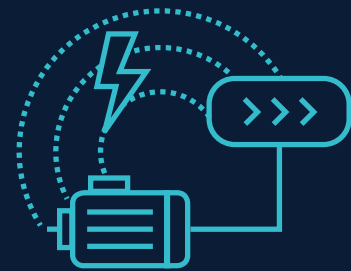
/ The Challenge

Added functionality in drivetrain, related to the towing-function of an aircraft.



High efficiency

Improved operating time of pure battery solution by optimized total efficiency.



Direct drive motor

High torque direct drive motor for maximum efficiency while remaining compact.



SmartShortCircuitBraking

Smart limitation of maximum braking torque even in the event of malfunction.

The towing operation requires a drivetrain with high sensitivity and controllability.

/ The Project

Multi-energy-solution

The successful »PHOENIX« product line must be augmented with renewable energy solutions:

- Pure battery with optimized operation time for most applications.
- Optional range extender with combustion engine (LNG, hydrogen...), generator and inverter.
- Future-ready: fuel cell and HV-DC/DC converter as range extender instead of combustion engine.

Project analysis

A project analysis together with the customer, taking the challenges of the application into account, generated the following conclusions:

- High performance to handle even very high towed loads.
- Extremely sensitive driving to avoid damage to the nose wheel.
- Pushback and towing over long distances with full power.
- Reliable operation in hot and cold countries as well in high humidity.

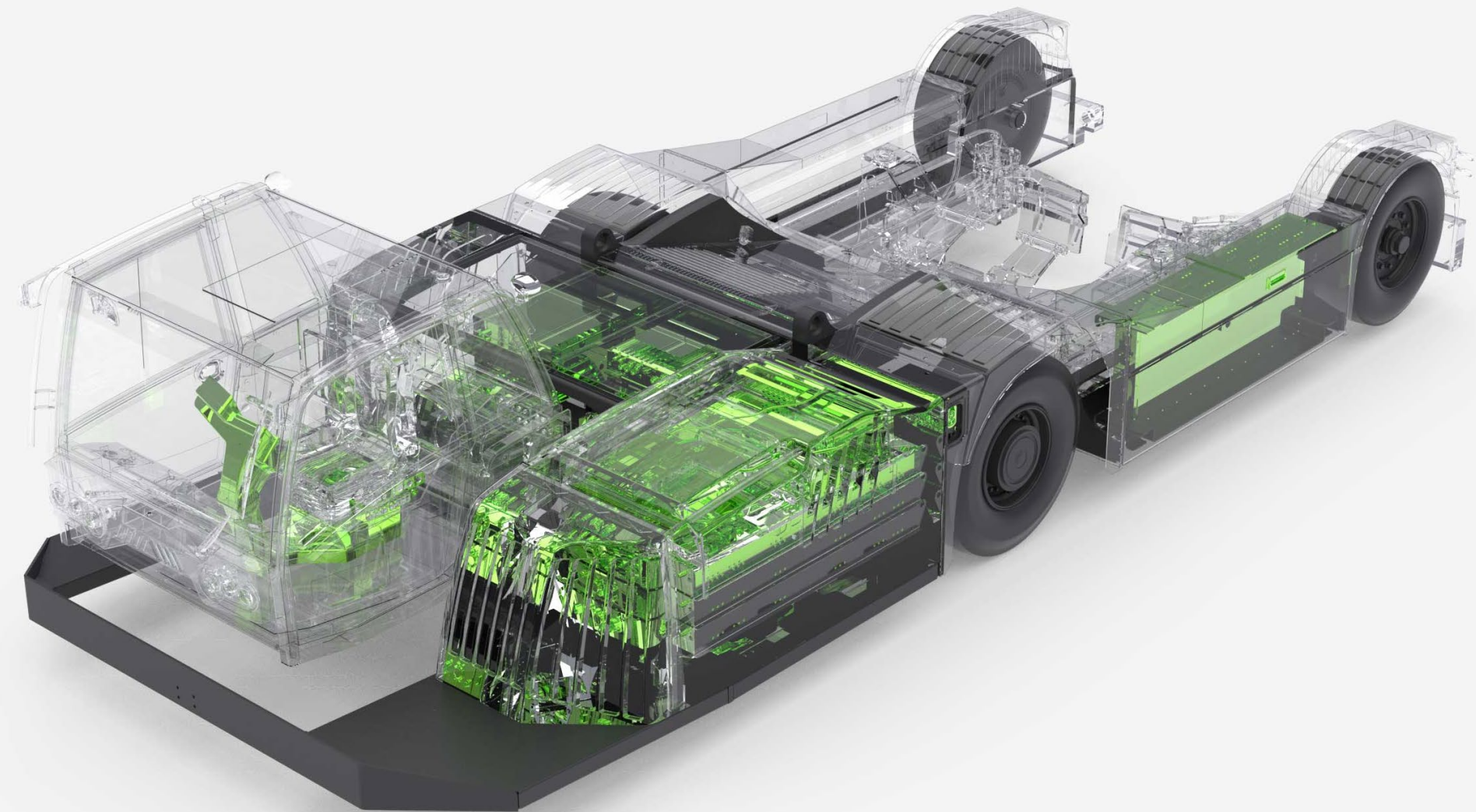
/ The Solution

Electro-mechanical propulsion



ARADEx Modular Multi-Energy-Solution:

- DirectDrive drivetrain with 4000Nm motor and inverter
- Adapted drive functionality
- Limited braking torque if short circuit is activated
- Optional range extender
- Future proof: prepared for hydrogen-based fuel cells



/ Scaled down solution: »SHERPA« E

Towing small airplanes & cargo transport



Economic solution using scaled down similar technology:

- DirectDrive drivetrain with 1200Nm motor and inverter
- Inverters and technology compatible to those used for »PHOENIX« E
- Identical tools for diagnostics and maintenance

/ Challenge us

Review of your application

Challenge us with your application, your demands and your ideas!

- + Our engineers can work out or support the project planning for your application.
- + You receive the result as an electronic document: cornerstones of your project regarding electrification or hybridization including dimensioning done by our experienced project engineers.
- + Contact our sales team for more information.

Thanks for your attention!

**Optimized usability
and performance
for the best e-mobility**



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