



Case Study IE-LIFT™

FES Brennstoffzellensystem

Fahrzeug Entwicklung Sachsen GmbH (FES) is a German development service provider based in Zwickau with process and complete vehicle competence that has been working for large OEM customers since 1992, as part of the Volke Group.

FES and Intelligent Energy announced in 2019 they would begin working together on developing a power product for the European electric powered fork lift trucks electric order pickers and tow trucks.

The Brennstoffzellensystem, developed by FES, is a zero emission alternative to traction batteries. It is designed to replace 210mm battery boxes used in the warehouse, logistics and distribution markets.

In Europe, conventional traction batteries are mainly used in electric powered fork lift trucks, electric order pickers and tow trucks. However, they have some considerable disadvantages in daily use, which are particularly evident in three-shift operation.

The Brennstoffzellensystem offers advantages such as a fast refuelling time, zero emissions, retrofitting, durability and very low maintenance. These features contribute to higher vehicle availability and thus reduce the costs during operation.

FES offers support in the areas of body development, chassis, powertrain, electronics / software as well as testing, prototype vehicle construction and driving test in the overall development process.

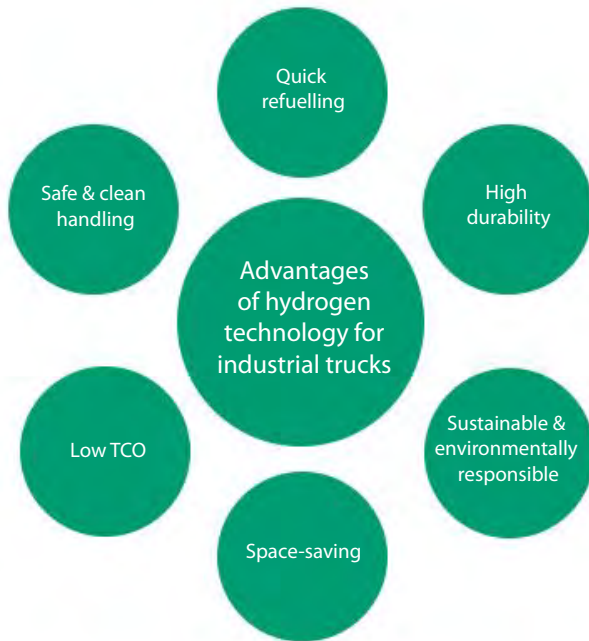
“There is great potential to save costs in the field of industrial trucks by using drive solutions with hydrogen. FES develops specific solutions based on customer requirements, which allow for maximum flexibility and compactness due to their modularity.

“The IE-LIFT™ from Intelligent Energy fits perfectly into this modular strategy and offers an optimal basis for integration with space-saving dimensions and high performance.”

**Ben Wendrock, Teamleader,
Media Management Powertrain**

In addition to its headquarters in Zwickau, FES also has offices/workshops on site at its customers in Ingolstadt, Gaimersheim, Munich and Wolfsburg.

Intelligent Energy's IE-LIFT™ was selected by FES and is capable of meeting the power requirements of current battery systems. IE-LIFT™ offers quiet operation, minimal maintenance (simply an air filter inspection or change), and zero emission at point of use (the only output is water vapour) and are reliable.



FES Brennstoffzellensystem Specification

- Low maintenance
- Durable tough design
- Designed for 30.000 h lifetime
- Plug and play replacement for batteries with standard connector
 - Standard battery box size
- Easy to use
- One button operation
- Control display to monitor all relevant operation functions
- Refuelled in less than 5 minutes
- Modular flexible design – other sizes on request
- Stand-alone system, no vehicle connection required
- CAN communication available on request



Features of the IE-LIFT™ technology at the core of the FES Brennstoffzellensystem

- Lower life-cycle costs than standby diesel generators; with minimal service requirements
- Zero harmful system emissions at point of use
- Quiet operation
- Lightweight and compact design for manual handling
- Small footprint
- Regulated output designed for hybridisation with a 24V or 48V battery array
- Proven and reliable fuel cell system technology
- Utilises Intelligent Energy's air cooled fuel cell technology with robust metal fuel cell construction
- Assured power availability
- Modular, scalable system
- Simple balance-of-plant

Applications for IE-LIFT™

- Non road mobile machinery
- Telecommunications
- Disaster recovery
- Portable power generation
- Backup power
- Emergency power
- Off-grid power
- Microgrids
- Auxiliary power units
- Material handling equipment
- Outdoor events



+44 (0) 1509 271 271
 sales@intelligent-energy.com
 intelligent-energy.com

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