

/ Battery Charging Systems / Welding Technology / Solar Electronics



Welcome to Fronius Manufacturing & Logistics Facilities Sattledt, Austria

International Workshop on Bipolar Plates for PEM Technology, May 20th 2015

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**WE HAVE THREE DIVISIONS
AND ONE PASSION:
SHIFTING THE LIMITS.**

FRONIUS - WHAT WE DO

/ We create new technologies and solutions for monitoring and controlling energy by shifting the limits of what is possible.



BATTERY CHARGING SYSTEMS

.....
Economical, flexible, unique



SOLAR ELECTRONICS

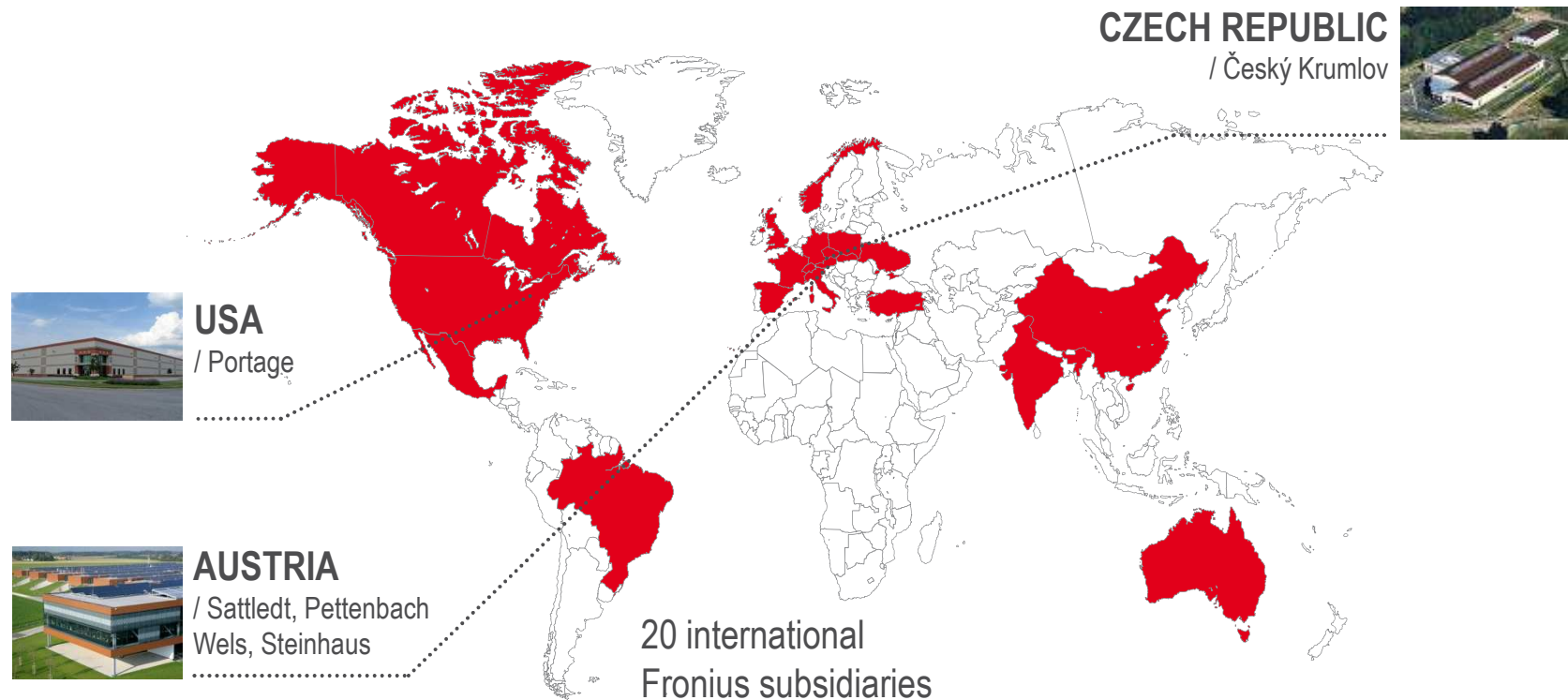
.....
We must revolutionise the energy supply
of our planet



WELDING TECHNOLOGY

.....
We master the arc like no other

PRODUCTION AND SALES WORLDWIDE



/ Stand: Sept. 2013

Sales partners /
representatives in
60+ countries

Fronius H2 Technologies



Energycell 10.0E HPEM Electrolyser

8kW/400VAC, 1,2Nm³/h
163bar, 80°C

L/W/H 1000/380/990 mm
ISO 22734-1:2008, EMC

Pilot production /
demonstration

HyLOG Fleet 26F PEM FC – Battery Hybrid

2.6kW/11kWp, 24VDC
H2 tank: 23L, 200bar / 6kWh(el)
28L, 350bar / 11,5kWh(el)

Temp. range (target): -10 to +60°C
L/W/H 786/310/630 mm
EN62282-5-1:2007, PED, EMC

Pilot production /
demonstration

HyLOG Fleet 100F PEM FC – Battery Hybrid

10kW/30kWp, 80VDC
H2 tank: 85L, 350bar / 35kWh(el)

Temp. range: -20 to +50°C
L/W/H 1028/855/771 mm
EN62282-4-101:2014, PED, EMC

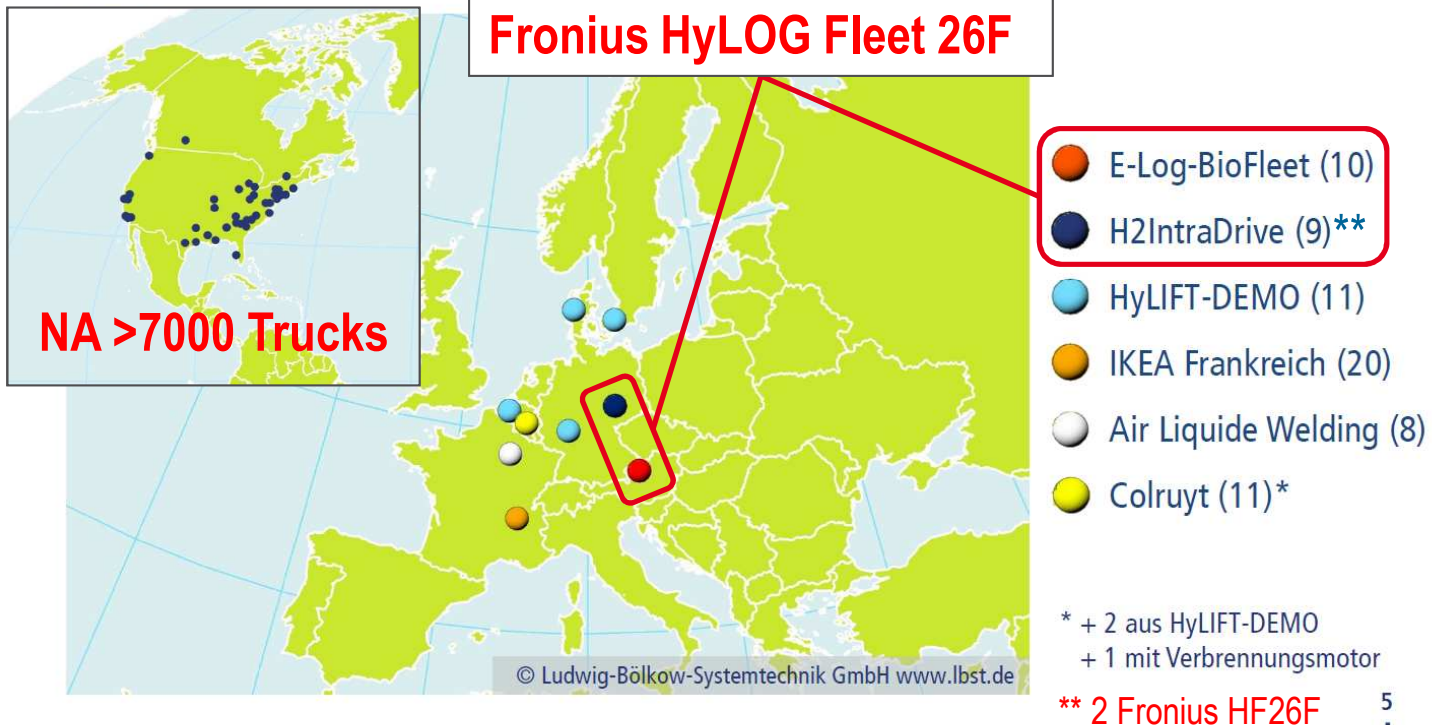
Product development

Einsatzorte der BZ-Flurförderzeuge in Europa



ludwig bolkow
systemtechnik

Insgesamt ca. 70 im Flotteneinsatz (Stand 2014):



Apr-14

© Ludwig-Bölkow-Systemtechnik GmbH

LBST.de

Status E-LOG-Biofleet @ DB Schenker

Duration: 06/2010 – 05/2016

/ Application characteristics

/ Location: DB Schenker cross-docking terminal Hörsching (AT)

/ Truck fleet: 10 (+2) Linde T20-24 AP/SP stand-on pallet trucks

/ Hours of operation: 24/5

/ Ambient temperature: 0 to +25°C

/ Indoor H₂ refuelling and on-site generation
from biogas: 0.45 kgH₂/h @ 200bar

/ FC fleet statistics (Mar 2015)

/ Truck on-time: 21.393h

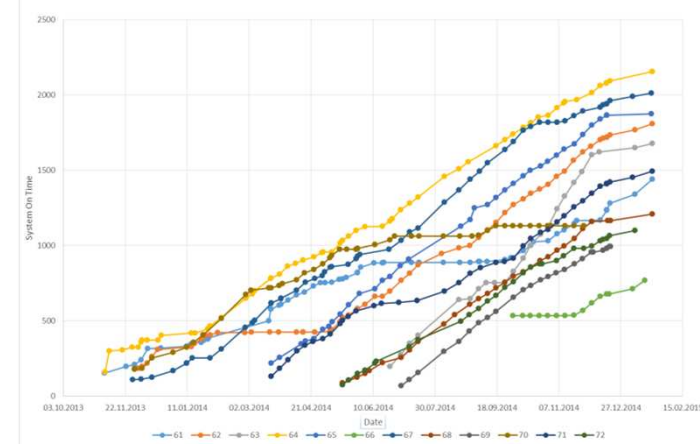
/ FC on-time: 11.228h

/ Start/stop cycles: 23.632

/ Truck power demand: <750W

/ FC system drive cycle efficiency max: 53%

/ Number of refuellings: ~3.020



ELAAN* PROJECT

Duration: 10/2013 – 09/2016



Municipal Vehicles

80V, **2 x 10kW / 30kWp**

Environment: Outdoor /
public roads



Class 1 Forklift Trucks

80V, **1 x 10kW / 30kWp**

Environment: Indoor / outdoor
plant grounds, public roads

Objectives:

/ 80V 10kW/30kWp FC-battery-hybrid system for industrial application

/ FC stack with low-cost metal BPP

/ 350bar H2 tank system

/ Modular Li ion battery system

/ Heavy duty environment: freezing / high temp. environm., road salt, jet-wash, etc.

/ Certification targets: road traffic admission, EU directives

*Elektrischer Antriebsstrang für Arbeits- und Nutzfahrzeuge (ELAAN)



Wind2Hydrogen Research Project

Duration: 01/2014 – 12/2016



Hydrogen generation from renewables for storage and transport via natural gas grid

- ▶ Modular high-pressure PEM electrolyser system development
- ▶ 100kW Power-to-Gas pilot plant engineering, commissioning & operation
 - ▶ Identify technical and legal barriers for application
 - ▶ Live operation data collection and analysis
- ▶ Business model development
 - ▶ Wind-capacity dependant hydrogen generation & storage
 - ▶ Electricity grid balancing services (load dispatch, residual load & price based operation, etc.)
 - ▶ Compressed hydrogen taped in bottles or fed into the grid
 - ▶ Renewable hydrogen fuel generation for H2 mobility



→ This project is funded by the Climate & Energy Fund Austria within the „ENERGY MISSION AUSTRIA“ program

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SHIFTING THE LIMITS