PowerCell  Sweden AB

Well suited for zero emission transport solutions
PowerCell - A Leading Company in Fuel Cell Technology

- Founded within the Volvo Group
- Established as independent company in 2008
- Listed on NASDAQ during 2014
- Over 13,000 shareholders
- Stable, long-term ownership from major investors
- Management & Board members with strong automotive background
- ISO 9001 & 14001 Certified

Vision

To be the world’s leading innovative fuel cell company by:
- creating value for customers in selected segments
- innovative products and systems for existing and future fuels
- providing efficient products that reduce the environmental impact
A Leading Company in Fuel Cell Technology

- Leading fuel cell technology built on 25 years of research & IP
- State-of-the-art fuel cell and reformer laboratories
- Highly skilled and competent employees
- Broad base of industrial and project partners
Broad base of industrial & project partners
Product Offering

Stack

- S2: 1-35 kW
- S3: 30-125 kW

System

- PS-5: 1 kW
- MS-30: 10 kW
- MS-100: 100 kW
- PS-1000: 1 MW
Flexible stack & system offer

Can be connected in series to achieve high power output

Can be packaged to meet OEM spacing requirements
HYON – Joint venture with unique capabilities!
PowerCell and Siemens collaboration for marine applications

PowerCell and Siemens maritime applications (video on YouTube)
https://www.youtube.com/watch?v=fCcbMAxWXGc
**PowerCell S3 – development path**

**AutoStack Moves**
Output: Common fuel cell stack specification

- **FIAT GROUP**
- **DAIMLER**
- **VOLKSWAGEN**

Project finalized 2010-2011

**AutoStack Core**
Output: Hardware evolution 1 and 2

- **BMW**
- **VOLKSWAGEN**

Project closed 2013-2017
Budget 14.7 MEURO

**AutoStack Industrie**
Output: Hardware evolution 3 and 4

- **BMW**
- **DAIMLER**
- **VOLKSWAGEN**
- **FORD**

Project on-going 2017-2021
Budget 60 MEURO

**PowerCell S3 product**

**FC mass production**
PowerCell S3

- Metallic bi-polar plates
- Power range 30 - 125 kW
- Highest power density stack in the world
- Designed in accordance with automotive cost targets
U.S. Department of Energy – reference cost targets

PRODUCTION COST ESTIMATION DOE 2015 BASED ON TODAY’S TECHNOLOGY

PRODUCTION COST EURO

ANNUAL PRODUCTION VOLUME

- **System Cost (€/kWnet)**
- **Stack Cost (€/kWnet)**
PowerCell planning for automated production
Nikola selects PowerCell S3 as primary stack choice

- Best in class performance
- Easy to integrate
- Suitable for mass production - based on industrial components
- Life time 20 000 h (expected)
- Price competitive
Industrial heavy duty forklift powered by PowerCell systems

- 54 kW Fuel Cell Power
- 60 kWh battery
- 16 ton capacity
- 9 kg of H2
City buses in China powered by PowerCell S2

- 8 m city bus
- Powered by PowerCell S2 stack
- Road tested at various air quality levels in China
- Road testing is approaching 50 000 km
- Certified for China government promotion list
PowerCell advantage

The fuel cell stack is the core and most critical component of a fuel cell system!

- Up to 125 kW power output available from a single stack platform serving varying segments which leads to synergies and economies of scale.

- PowerCell stack technology features leading power density facilitating vehicle integration and maximizing power output.

- PowerCell stack design and processes are based on cost-effective mass production capability.
PowerCell
- A Leading Fuel Cell Company

Contact:
Johan Beyer – Business Manager
johan.beyer@powercell.se