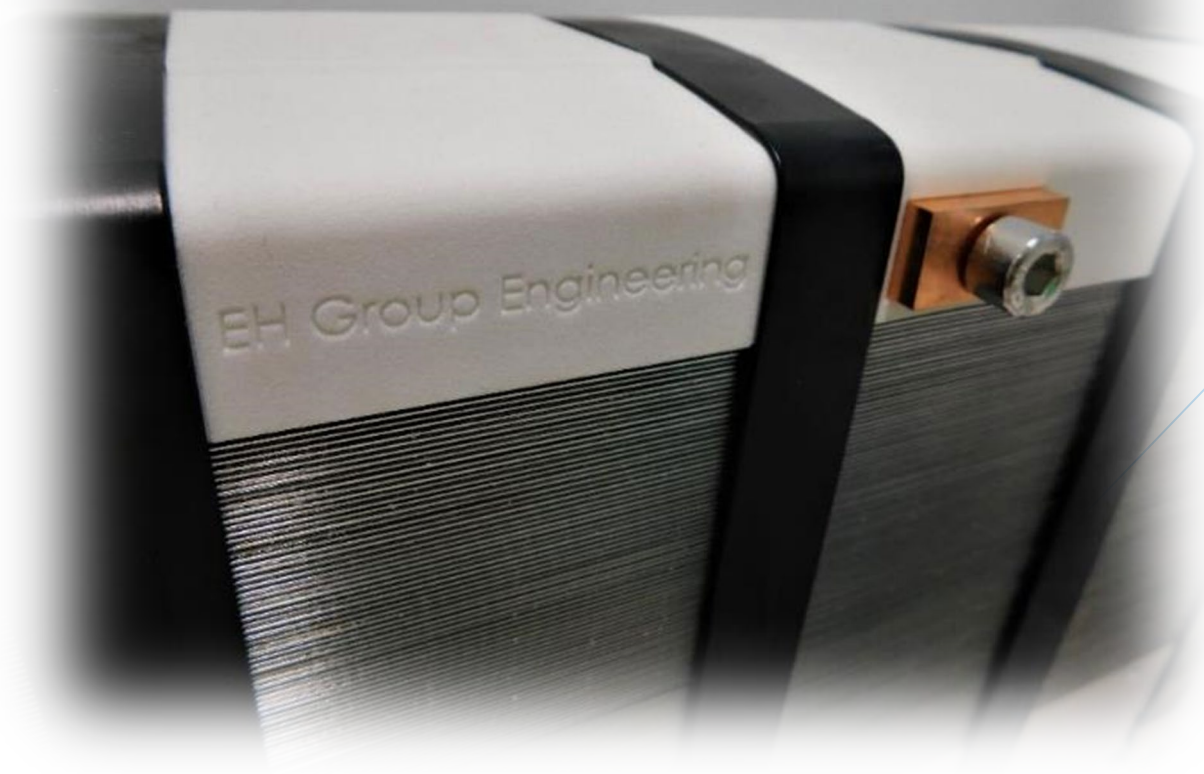




# EH GROUP ENGINEERING



[www.ehgroup.ch](http://www.ehgroup.ch)

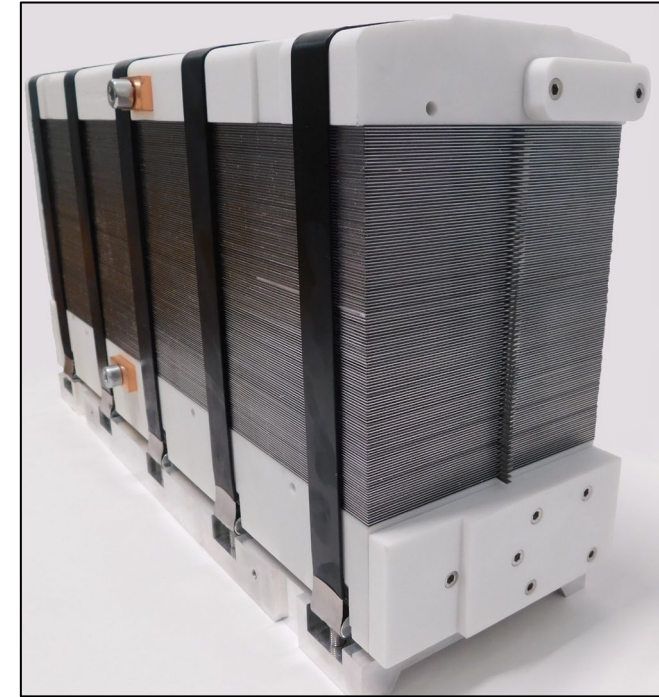


# EH Group Fuel Cell Technology

- Uniquely re-designed fuel cell stack at the microstructure level - more **compact, lightweight and efficient**.
- New concept of continuous FC production process
  - Unique machinery with fully integrated assembly
  - **Significantly faster & cheaper at scale\***: **< 100EUR/kW**
- Operates with **minimal effects of gravity** & in any orientation - great candidate for mobile applications;  
→ Collaboration with



\* At scale refers to 100,000+ units per annum



EU GA945810 – EHSTACK.



# Our Technology Edge

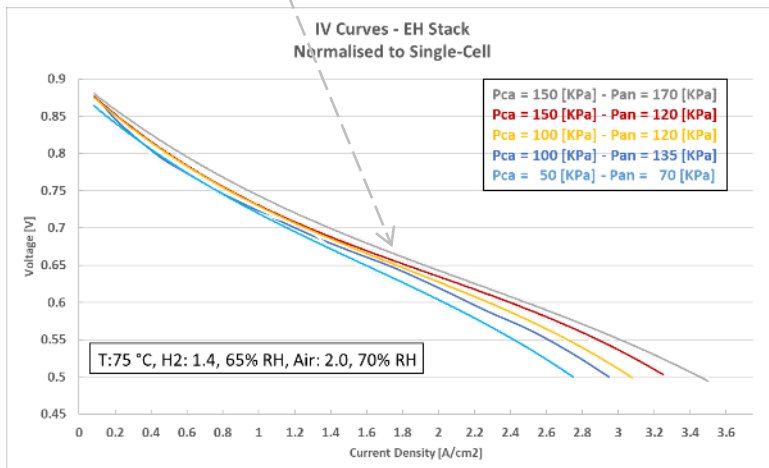
## Technology Comparison

Parameters	Toyota (MIRAI)	Honda	PowerCell	Ballard ( <i>High Performance FC</i> )	EHG FC STACKS
Volume Power Density [kW/L]	5.4	3.1	4.8	4.3	8.0
Weight Power Density [kW/kg]	3.0	2.0	2.9	2.7	4.0
Cell Pitch [mm]	~1.0	~1	~1.0	N/A	<0.8

NOTE: data from other suppliers are collected from the public domain and EHG doesn't guarantee 100% accuracy

## Example of Performance Curve

High Power Density at **lower** pressure



## The Edge

### STACK:

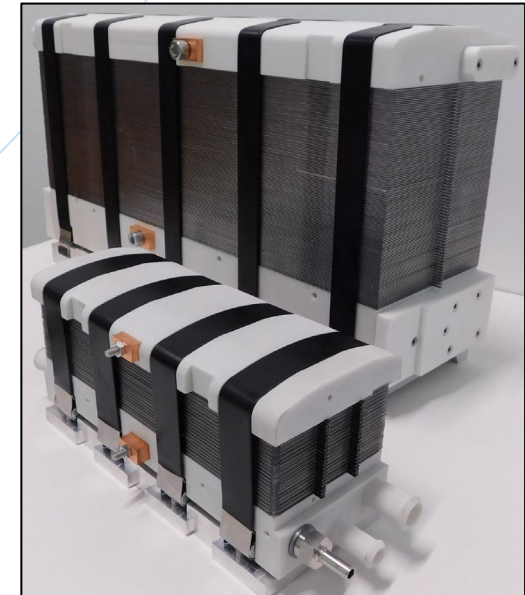
- Higher Power Density
- Power range: **0.1 – 250 [kW]**

### SYSTEM

- Compact design
- Higher efficiency

### SOLUTION

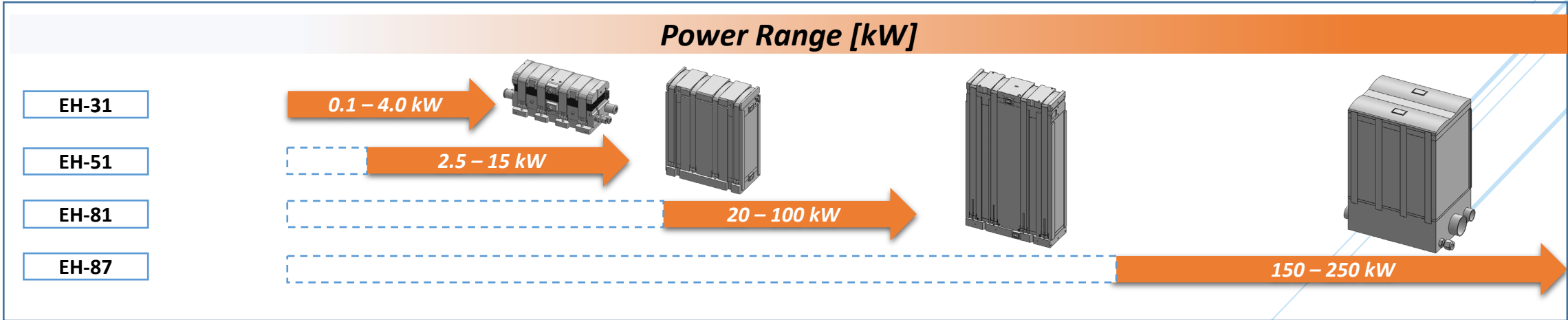
- Scalable
- Durable
- Customisable



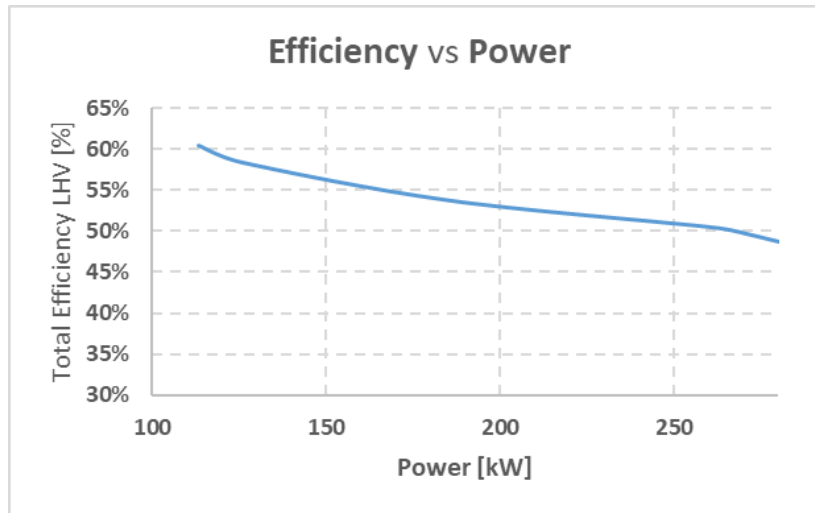


# EHG Fuel Cell Products

## Fuel Cell Stack & System Platforms



## Total System Efficiency vs. Power output







# EH Fuel Cell - Mobile Applications

## Stacks & systems deployed since early 2020

- Electric vehicles – commercial & off-road
- Forklifts
- Marine projects
- Signed Major Agreement in Mining Sector

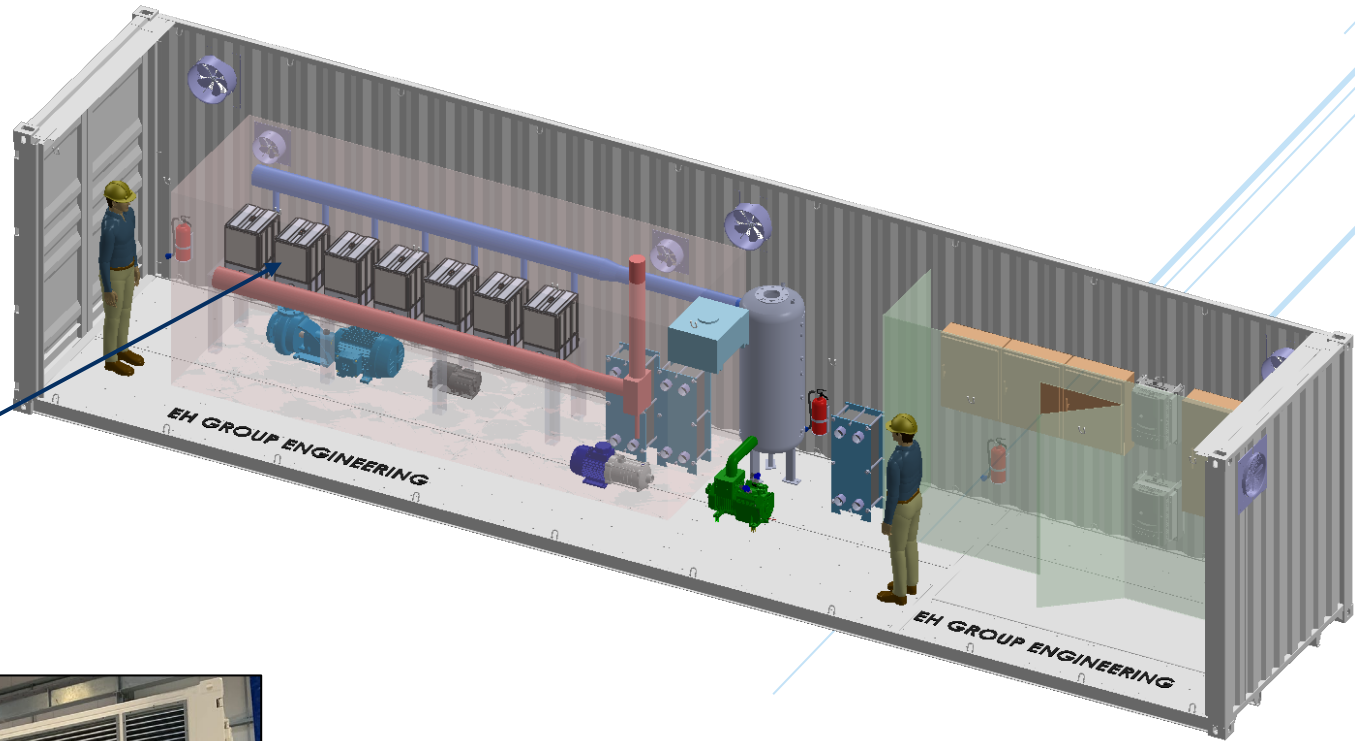




# EHG Fuel Cell - Stationary Applications



EHG 250kW FC  
module



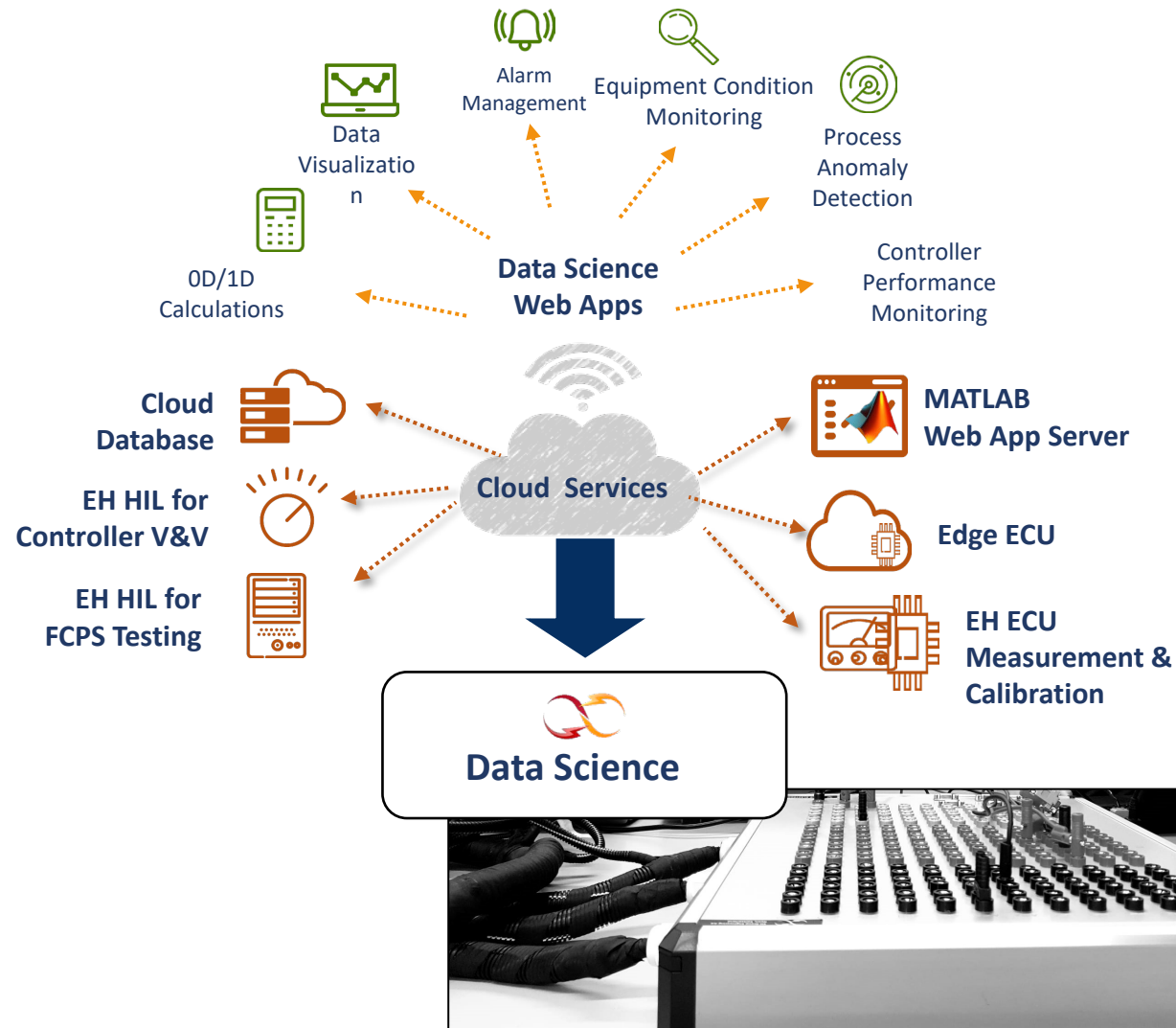
Backup Power & EV Supercharger



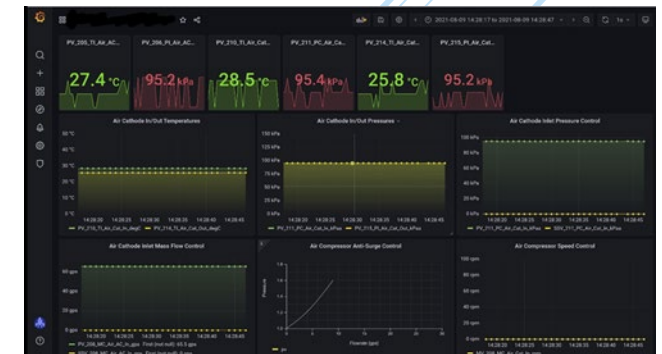
Collaboration with SNAM –  
Europe's largest gas grid operator  
for 1-4MW applications



# EHG Fuel Cell Data Science



- Process Control Automation Cloud-based Data Telemetry with **Edge ECU**
- **FCPS Dashboards** for monitoring



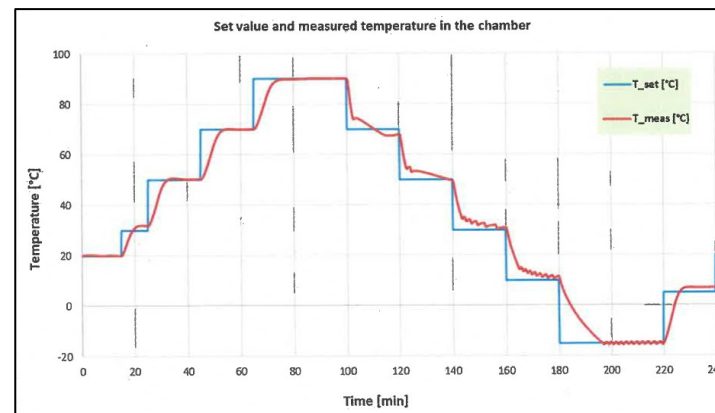
- With **Cloud services** -
  - Remote Support
  - Predictive Maintenance
- **EH FCPS Digital Twin**
- **FCPS & vehicle simulations**



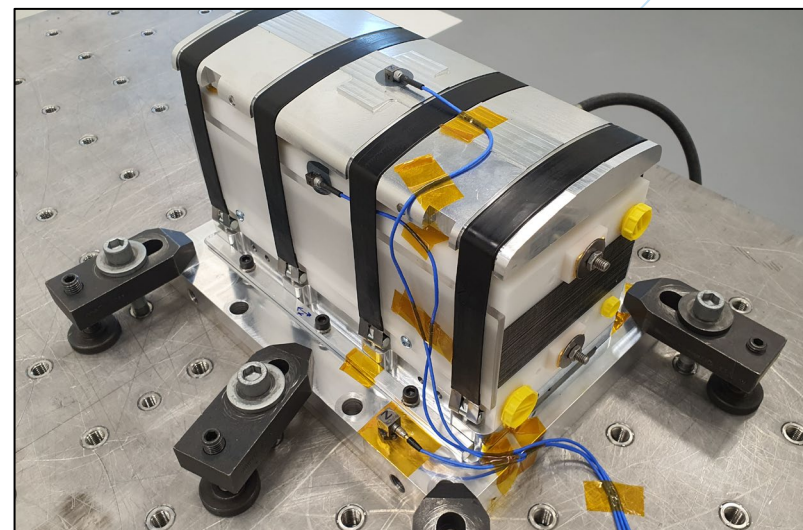


business incubation centre

Switzerland



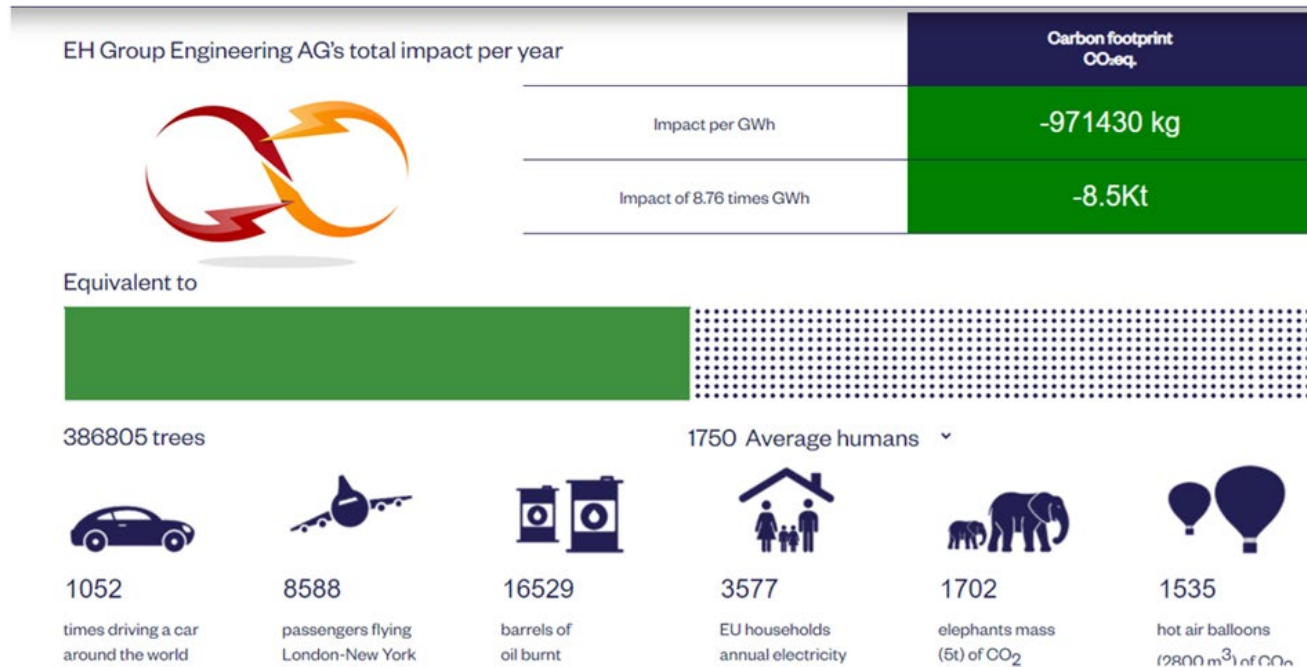
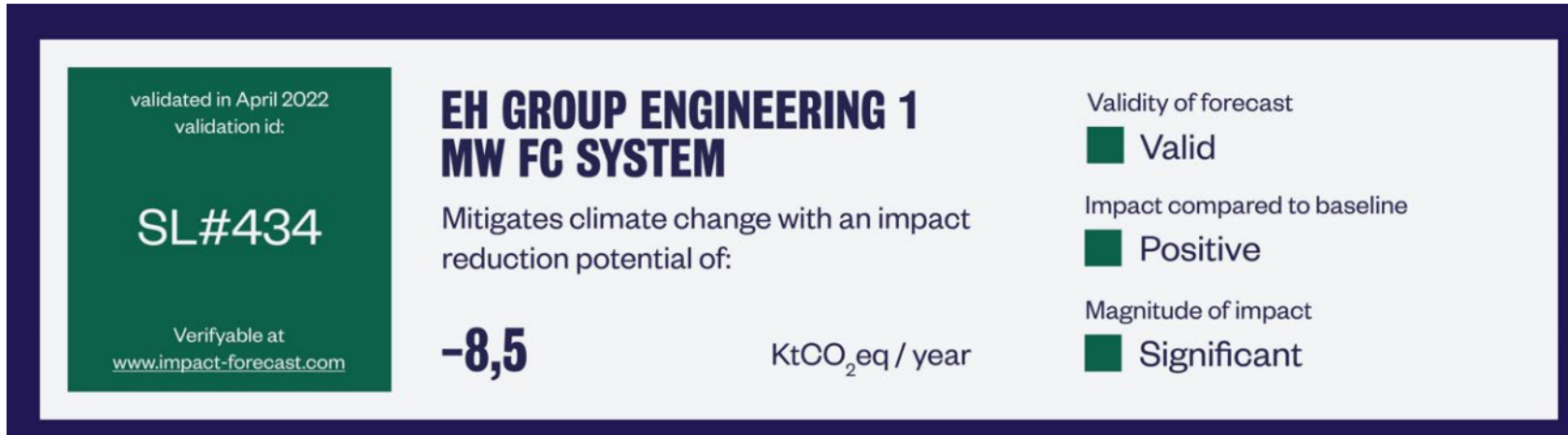
- Two-year collaboration project
- Thermal tests, vibration tests in space labs







# The Impact



Source: Impact Forecast - Dutch impact software & services company with a scientific team to apply science-based impact assessments (<https://impact-forecast.com/>)



# FACILITIES



- Multiple test bench facilities for testing up to 250kW
- Dedicated Hydrogen Supply
- Electronics & Assembly labs

- Room for expansion for production facilities
- 2000m<sup>2</sup> of customized lab space





# Core Team



## Dr Mardit Matian

- Founder/Director: Technical lead
- PhD - Imperial College London
- 18+ years fuel cells, H2 production



## Alexandre Chainho

- Mechanical designer/integrator
- 14+ year experience FC assembly, system design and prototyping.



## Anand Vasappanavara

- Senior Control/Automation Engineer
- MSc Mechanical Engineering, Controls
- 10+ years in fuel cell applications



## Dr Isabel Vazquez

- PhD Chemistry Queens University
- Electrochemist & Material Scientist
- 5+ years PEMFC Characterisation



## Pierre Georges

- MSc Mechanical Engineering
- Fuel cell retrofit of vehicles



## Christopher Brandon

- Co-Founder/Director: Finance & strategy
- MA Economics (Hons) – Univ Edinburgh
- 23+ years finance & entrepreneurship



## Alice Maffezzoli

- Business Development Manager
- MSc Electrical Engineering, MBA
- 10 years business management



## Julie Veya

- Mechanical and Robotics Engineer
- MSc Mechanical Engineering ETH
- 3 years FC systems & control



## Samuel Goutenoir

- Embedded/Electrical Engineer
- MSc Engineering
- R&I Electronics Engineer 7+ years



## Levi op't Land

- MSc Mechanical Engineering
- Forze Racing Team FC Systems Engineer



## Dr Aris Papasavvas

- Control Engineer
- PhD Real-time optimization processes (U Edin)
- MSc Mechanical Engineering EPFL, ETH Zurich



## Sveinung Dybdahl

- Director (USA): Business Devt & Finance
- BSc Business Administration – Univ Bath
- 20+ years in energy and transport finance



## Tanushree Madhugiri

- MSc Mech Eng, MBA Global Procurement
- Senior Manager Advanced Engineering
- 10+ years simulation, automotive OEM R&D



## Rohit Shete

- BSc Electronics Engineering
- Software controls, ECU, HIL & MIL testing
- 10+ years automotive OEM R&D



## Gustavo Vallejo

- MSc Embedded Systems
- Electronics Engineer
- 5+ years automotive OEM R&D



# Advisory Boards

## Scientific Advisory Board



**Prof. Jan Van Herle**



EPFL Switzerland  
Senior lecturer and researcher  
Fuel Cells, catalyst contamination



**Prof. Nigel Brandon**



Imperial College London  
Professor of Electrochemistry  
Dean, Faculty of Engineering ICL



**Prof. Dan Brett**



University College London  
Professor of Electromechanical  
Head of Electrochemical laboratory UCL

## Advisory Board



**Bernard Sabrier**



Group Chairman of Unigestion  
CEO Unigestion Asia Pte Ltd  
Leading European PE & alternatives manager  
Swiss Entrepreneur & philanthropist



**Carl-Peter Forster**



Former Group CEO Tata Motors  
Chairman & Managing Director Opel AG  
President General Motors Europe  
Board Member - Geely Automobile & Volvo Cars

Additional (diverse) Senior Advisors to be announced...





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Some of our selected partners:

