



H2Motion GmbH

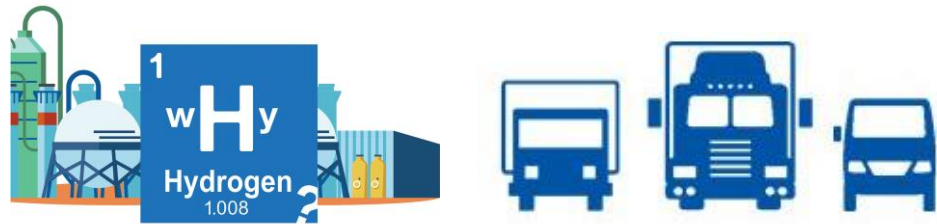
FN 537 546 i - ATU 75763005

www.h2motion.at

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Dr. Michael Sikora, MD

sikora@h2motion.at



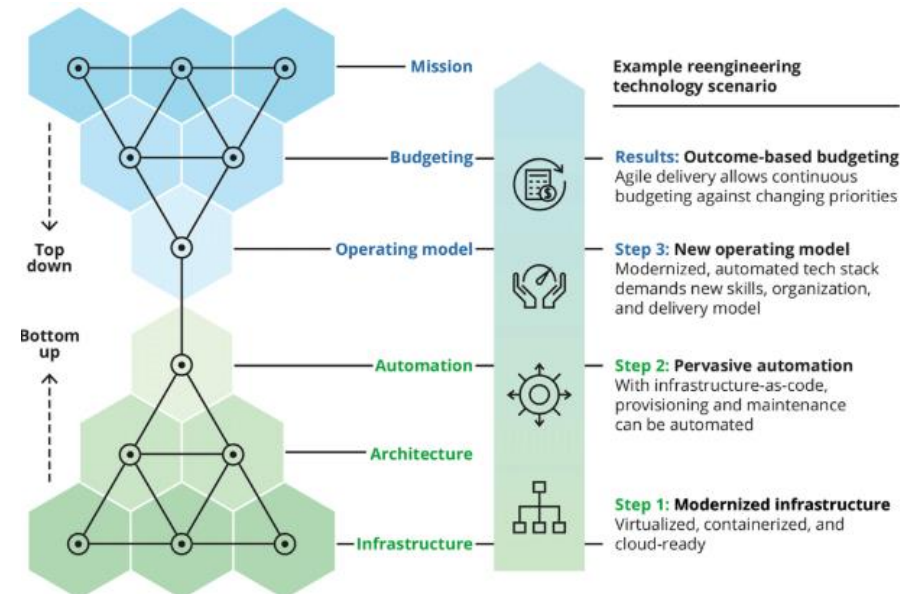
Mission H2Motion GmbH

H2Motion develops and engineers technical feasible and commercial viable hydrogen motion/transportation concepts to successful products & services.

H2Motion is a trusted partner for renewable and sustainable energy projects and zero-emission fuel cell propulsion solutions on the road at the sea at in the air.

Why working with H2Drive GmbH in H2 Vehicle projects?

- ❖ 15+ years Partner of a profitable management engineering company in Asia
- ❖ Operations & teams growth by cash-flow and profit only (NO subsidies)
- ❖ Industry Awards: Top Achievers Club, Entrepreneur of Year,...
- ❖ Proven Expertise in NEV New Energy Vehicles & BEV components since 2007
- ❖ H2 drive lab for innovative concepts; green hydrogen production
- ❖ Bottom-up & top-down service methodology
- ❖ Aftermarket retrofit Hydrogen services
 - H2 REX for BEV technical feasibility
- ❖ Take on responsibility for achieving project goals
- ❖ Cost-efficient partner in DACH and APAC

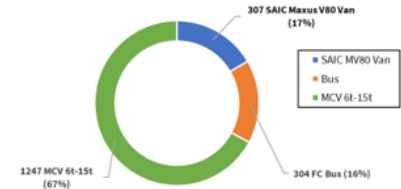


H2 Motion Services

❖ H2 Fuel Cell Analytics

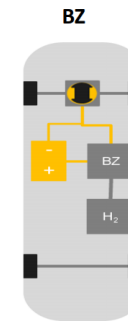
- FC Statistics (Park, MIIT, fleet operator)
- FCI Mobility Insights (market update APAC, DACH)
- FC OEM Tech DB (OEM, Tier 1 and integrator)

China FCEV Registration Data
Q1-Q4 2019



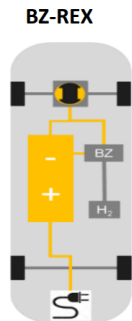
❖ H2 Transportation Services: trucks & busses

- Business Case: diesel citybus & rolling stock
- Investment & operation planning CAPEX, OPEX
- BD Sales plan tool for ÖPNV customer
- Technical Feasibility consulting



9 | 15.06.2020

		BZ	BZ-REX
Solobus 12 m	HV-Batterie	30 kWh	250 kWh
	H ₂ -Tank	39 kg H ₂	15 kg H ₂
	Brennstoffzelle	100 kW	30 kW
Verbrauch pro 100 km (125 km Umlauflänge)		BZ	BZ-REX
	Verbrauch pro 100 km	8,5-10,5 kg H ₂	40-160 kWh Strom; 0-6 kg H ₂
	Verbrauch pro 100 km (250 km Umlauflänge)		135 kWh Strom; 1 kg H ₂
			80 kWh Strom; 3,5 kg H ₂



❖ 48V powertrain H2 REX Engineering

- 48-96V H₂ REX Hybrid Powertrain: Supercaps + Fuelcell+ LiFeYPO₄ & BMS + high-end Controller (96V/500Amp) eMotor von L.M.C. (UK)
- Green & Safe hydrogen production, scalable 0,5kg → 66 kg



H₂ Production @ bus/truck terminal

❖ Scalable local H₂ production: 1kg to 64kg per day



Hydrogen Production

500 NL/h or 0.5 Nm³/h 12 Nm³/day

≈ 1kg H₂ 4.0 p.d.

Efficiency

4.8 kWh for 1 Nm³ of H₂

Hydrogen Purity

~99.9%

Power Consumption

2.4 kW

Input Water Purity

<20 μS/cm

Output Pressure

35 bar

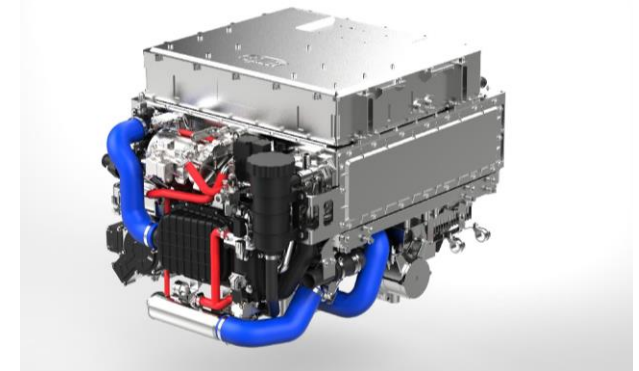
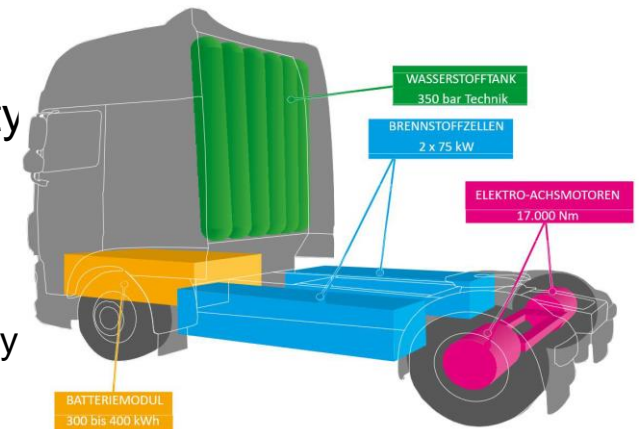
Nominal power consumption	155 kW
Standard grid connection	3 × 400 VAC three phase grid
Nominal standby power	11 kW
Hydrogen production	30 Nm ³ /hr 720Nm ³ /day 2.6kg/h 64 kg/day
Dynamic hydrogen production range	1 - 100%
Hydrogen output purity	99.999% in molar fraction
Output pressure	0 - 35 barg
Water requirements	Clean tap water, internal purification included
Water input pressure	1 - 4 barg
Average water quantity	~ 46 L/hr ~ 1 m ³ /day
Cooling system	Liquid-cooling
External dimensions	20' container W × D × H in m = 2.44 × 6.06 × 2.59

- ❖ Dynamic & innovative and experienced family run business
- ❖ 40 engineers, programmers, mechanics and sales support
- ❖ Head Office in Winsen, Germany - Branches and agents in Austria, Denmark, China and Switzerland



HyBat Project: 40t Truck Conversion to hydrogen-battery drive

- ❖ Clean Logistics GmbH offers to convert 40t Semi-trailers to emission free H₂ drive
- ❖ Development & conversion of 40t semi-trailer
- ❖ Fleet Maintenance & Service is provided by E-Cap Mobility
 - ❖ Driving range: 500km
 - ❖ Energy storage: 42 kg H₂ tank (35 MPa) + 200 – 300 kWh LFP battery
 - ❖ Energy Consumption: 1,5 – 2 kWh/km
 - ❖ TÜV ECE type approval



HÖPEN GMBH



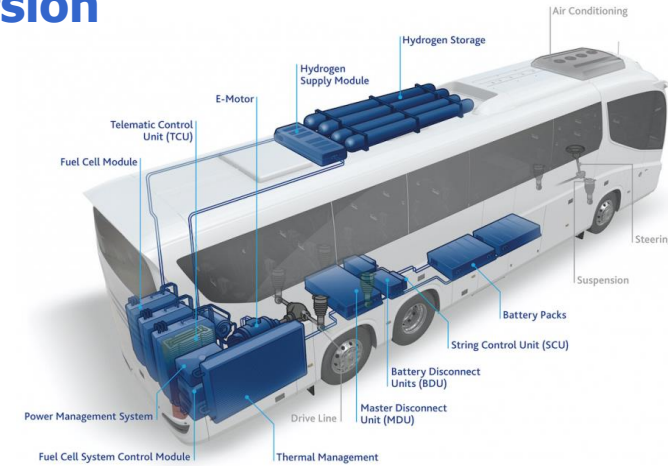
Mobilität



H2 Transportation: Citybus Conversion

❖ Technical Feasibilities Conversion Engineering

1. Recording and analytics of motion data via geo logging & dashcam of vehicle (routings)
2. CAN-data recording of interface of city buses
3. Laser measurement of vehicle chassis/engine compartment for component retrofit
4. Selection of best-in-class, reliable system components
5. Definition of interface data of the diesel CV to be converted into FCCV
6. Definition of the installation spaces for fuel cell system, tanks and E/E auxiliaries (DCDC, DCAC)
7. FCEV conversion concept, CAD draft, BOM, documentation cost estimate (CAPEX, OPEX) and maintenance concept



Proof-Of-Concept: H₂ Racing Gokart 1

❖ Feasibility study: H₂ Fuel Cell Conversion Engineering



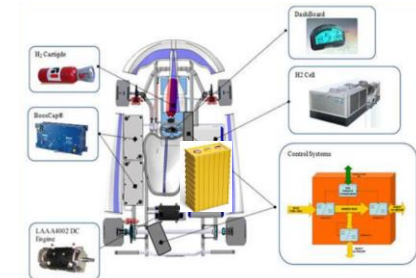
- Technology carrier: racing gokart with dual-disk brake system, dismantled 15PS

• H₂ REX³ 96V drivetrain triple energy & propulsion system

+ **Energy:** Skeleton 52V177F supercaps / H₂ tank 350bar / Li-Ion 44-96V/200A BMS

+ **Motion:** BLDM and brushed DC motor 18kW rated. 36kW peak, 400Amps peak

+ **Inverter:** 96-114V/300A peak max Sine-wave pulse with modulation and Level 3 recuperation to charge supercaps



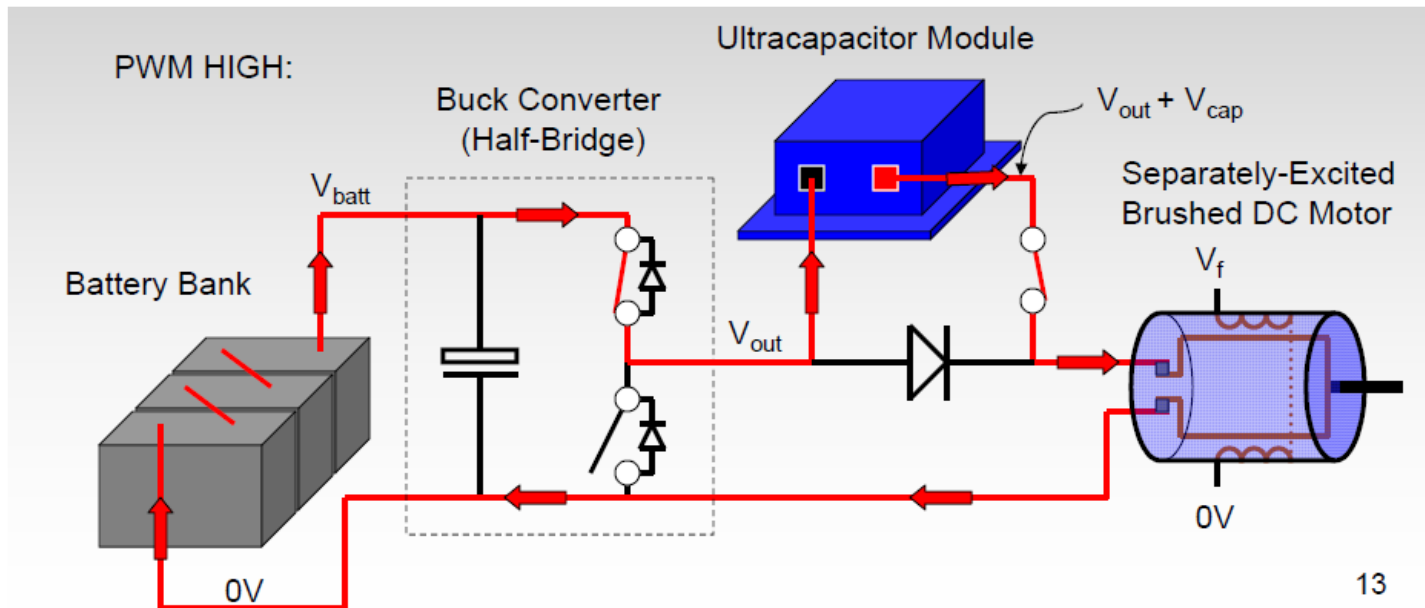
- CAD design of battery housing (alu/composites), drivetrain mountings STEP2
- Manufacturing capabilities: AC/DC MIG-welding, paint cabin, grinding, drilling, metal circular saw, CNC lathe in prototype lab
- Innovation: Tripple energy system, eDrive integration, testing, calibration

Proof-Of-Concept: H₂ Racing Gokart 2

- ❖ Feasibility study: H₂ Fuel Cell Conversion Engineering „Technologieträger“ innovation project



- ❖ Normal drive energy from 48V system, supercaps assist boost during acceleration



Hydrogen Sector Coupling Services



❖ Hydrogen Sector Coupling Services for cities

- PV to produce hydrogen energy for city district utility provider and local SME
- Local/city vegetable growing to become supply-chain independent
- Green city, zero-emission micro-mobility



Our Partner

Our Hydrogen Mobility Partners

MAHLE

Driven by performance

ecap
MOBILITY

 **Horizon**
Fuel Cell Technologies

Magna Steyr

Fuel Cell Vehicle Integration

NEUMAN
ALUMINIUM
INDUSTRIES

Making our world
more productive



FTXT
未势能源

PARAT 

 **Air Liquide**

Supervisors & Mentors

- ❖ **Wolfgang VLASATY:** Member of the Executive Board Business Division Lighting HELLA, President HELLA BU Lighting, Americas
<https://www.linkedin.com/in/wolfgang-vlasaty-442085a9/>



- ❖ **Werner BRUCK:** Chairman of the Board & President, Pankl Engine Systems Inc MD Pankl Engine Systems GmbH & Co. KG, Formula I Engine supplier
<https://www.linkedin.com/in/wernerbruck/>



- ❖ **Karl HOSEMANN:** SME Business Support, Vienna Business Agency
<https://viennabusinessagency.at/about-us/the-company/team/#H>



Project References

H2 FCEV & NEV clients



H2Motion @ Conferences

Shanghai Fuel Cell China Workshop, 2019, Sept 10th

<https://germanchambershanghai.glueup.cn/event/23233/>



- ❖ State leader's policy goals & concrete actions
- ❖ China energy transition: Renewables on the upswing
- ❖ Hydrogen production: Coal gasification still dominates
- ❖ National support policies up-/downstream & FCEV subsidies
- ❖ HRS Hydrogen Refueling stations roadmap China
- ❖ FCEV PV + CV segment forecast, C-OEM model strategy
- ❖ Fuel Cell technology & Supply Chain SWOT China
- ❖ Hydrogen & Fuel Cell investment potential

❖ Partner: **Magna Steyr**

Fuel Cell Vehicle Integration

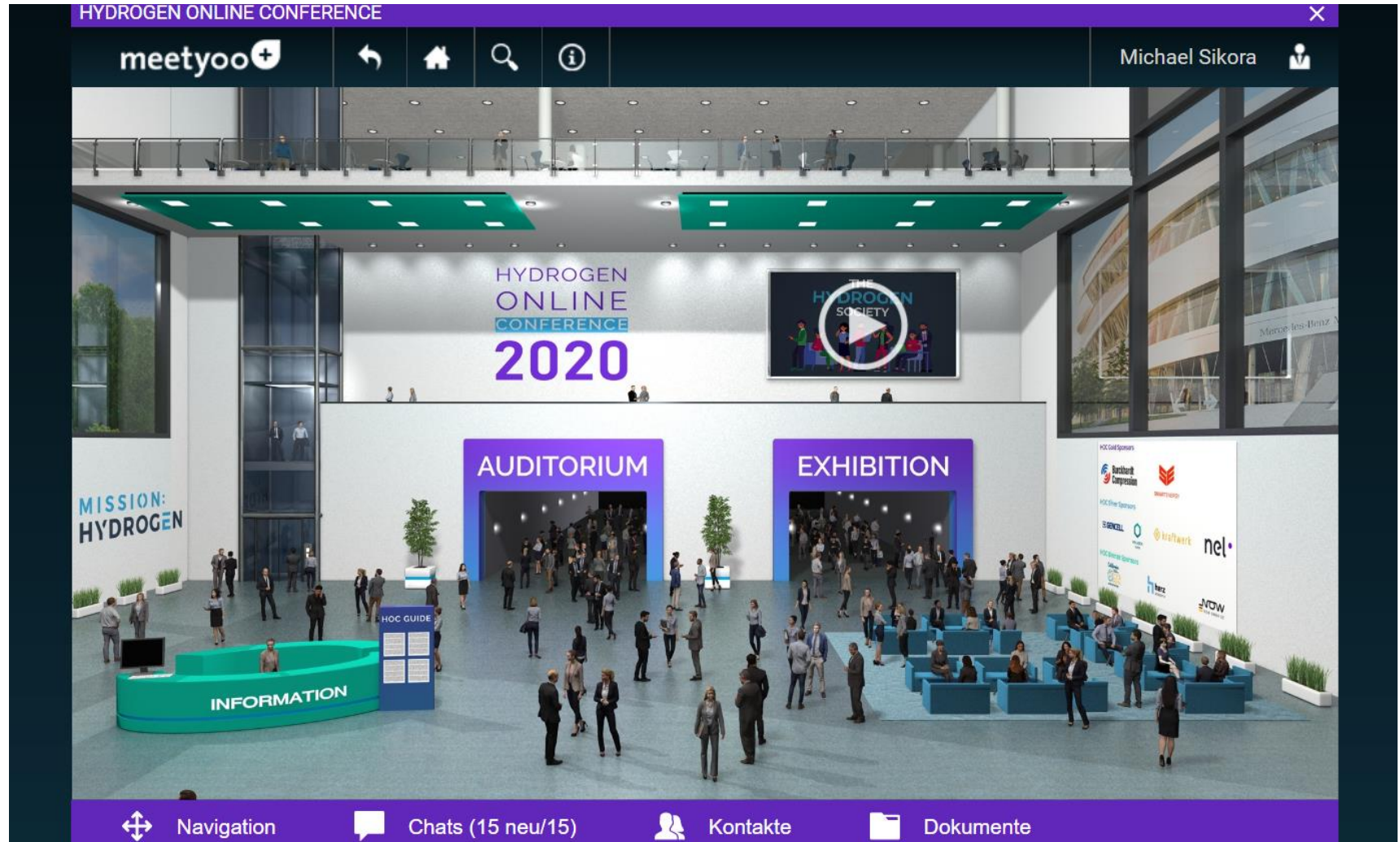


**Grove
Hydrogen
Automotive**



Our booth @ Online Hydrogen Conference Oct. 8th

<https://hydrogen-online-conference.com/exhibition/>



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H₂
Analytics
Feasibility

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Production
Safe Storage

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Use Case
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Aerospace

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ÖPNV-Bus
Trucks
Conversion

www.h2motion.at

H₂Motion

H2MOTION

Hi, we are interested in hydrogen electrolyser/refuelling solution for the first of its kind in Hungary- fuel cell bus project. Please contact: info@hy-hybrid.com

Shashwat Parsana

I am in Italy and graduated very recently in Energy Engineering (MSc) from Politecnico di Milano. My master thesis was on Green Hydrogen Production which made me interested in Hydrogen Technologies. Are there any opportunity in your company for a fresh master graduate like me? Thank you!

Open Positions

Four job listings are displayed on the board, each with a title and a brief description of the role and requirements.

Our booth @ Austria Connect Nov. 11th

<https://austria-connect-china-2020-shanghai.b2match.io/>

AUSTRIA CONNECT China 2020, Shanghai & Digital
6 November 2020

[Home](#) [Speakers](#) [Participants](#) [Agenda](#) [Meetings](#) [Messages](#)



Booking phase starts on Friday, Oct 23, 2020.



Dr. Michael Sikora

Managing Director at [H2Motion GmbH](#)
Vienna, Vienna, Austria

[Edit my profile](#)



An Austrian company without a subsidiary in China / Virtual Participant

H2Motion GmbH

H2Motion GmbH

H2Motion is a management engineering partner, providing insights in renewables and hydrogen energy business. Our fuel cell engineering team in DACH and APAC develops proof of concepts, innovation and safe hydrogen storage solutions. Working with leading suppliers around the globe, we offer FCEV retrofits on the street, and soon for aviation and marine applications too.

Economic Sector

Automotive

Aviation and aerospace

Environmental technologies, renewable energy

Consulting / Law

Registered on September 29, 2020