PROTON MOTOR
hydrogen fuel cells

Meeting future energy needs with

Hydrogen Fuel Cells For Mass Market Use

September 2023

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Introduction

Investment Summary

Proton Motor is uniquely well placed to take advantage of the acceleration in the adoption of hydrogen fuel cells across addressable market projected to reach $32bn*, covering four key sectors: Stationary, Maritime, Rail, On/Off Highway.

GKN HYDROGEN

Shell Hydrogen

VONOVIA

ELECTRA

FINCANTIERI MARINE GROUP

Proven products and systems

- Multi year real world and lab testing across target markets
- Demonstrated >20,000 hours operation durability, across applications
- Clear commercial advantage in cost, flexibility and reliability

Strong established market position and reputation to leverage growth

- Strong relationship with OEMs, utilities, system integrators & tier 1 suppliers
- Repeat orders from blue chip customers based on established trust in the product
- Total cost ownership data available through extended real world testing

Scalable and protected business model

- Investing in automated stack production facility capable of producing >30,000 units p.a.
- Licencing / contract manufacture for production of fuel cell systems, container applications and fuel cell stacks
- Economies of scale reduce automated unit cost significantly
- In-house capabilities and protected IP / one–stop providers across value chain

Clear market strategy based on early adopters

- Target markets require long duration uninterrupted power supply unsuitable for pure battery application
- Size of target markets offer significant commercial potential

Market acceleration taking place through wider commercial adoption

- EU and UK political commitment and ensuing legislation driving change
- Reducing reliance on oil and gas from Russia – Real political commitment
- Ready for mass market ramp-up and mass deployment with best in class product

*Sources: *Fuel Cell Market Growth Analysis-2030 | By Type, Application (alliedmarketresearch.com), E4tech annual Fuel Cell Industry Review, Global Market Insights, The Fuel Cell Industry Review 2020*

Company Background

Two core fuel stack types:
HyStack® 200 and HyStack® 400
capable of delivering 5kW to 50kW
across multiple applications

Focus on **Proton Exchange Membrane**
(PEM) fuel cell development

> 120
employees

and with over
25 years
product development and
validation company

13,500 m²
of office, testing, development
and assembly area

Currently based in
Puchheim (near
Munich)

Large IP portfolio consisting of
40 core patent

Quoted on AIM since
2006

Board & Management

A combination of technical, commercial and governance expertise.

Faiz Francois Nahab Ph.D., Chief Executive Officer

Over 35 years of executive management experience in company restructuring and expansion. Served as a consultant to major international companies on technical and high technology projects with a focus on product sales, marketing and product development.

Dr. Nahab holds various Directorships at companies in the pharmaceutical, medical and technology sector.

Studied Electronics at Southampton followed by a PhD at Kent University, UK in Electronics. Dr. Nahab holds full membership in the Institute of Electrical and Electronics Engineers.

Roman Kotlarzewski, Group Finance Director

English qualified Chartered Accountant member of ICAEW with over 30 years of industry experience including financial leadership in private and public companies at an international level: Boots PLC, Standex International and BASF.

Studied Modern Languages and Economics at Northumbria University and speaks English, German and French.

Helmut Gierse, Chairman

Over 30 years of international industry experience across factory automation, process industry and power generation. Experience rooted in work across R&D, production, sales and marketing.

Mr. Gierse has held a range of industry positions at management level, most recently as CEO and President of the Siemens Group in Automation and Drive in Germany. He is also an independent industry consultant.

Studied Electronic Engineering at the Universität Erlangen, Germany. He is fluent in German, English, French and Spanish.

Manfred Limbrunner, Director of Investor Relations and Communication

Joined Proton Motor in November 2000 as a design engineer and project manager for various mobile and maritime projects. In his early years he was also in charge of the systems engineering and the homologation of the Fuel Cell Hybrid Systems of Proton Motor.

Formed and led the design department, played a significant role in implementing the quality management system. Appointed CTO in March 2011. Appointed to Director Sales and Marketing in February 2018 and to Director Governmental Affairs and Communication in October 2022

Studied mechanical engineering with a focus on design at the University of Applied Science in Kempten.

Board & Management

A combination of technical, commercial and governance expertise.

Sebastian Goldner, Chief Technical and Operations Officer

Over a decade of experience in the design and construction of mobile, marine and stationary fuel cell applications. His experience includes various leadership positions in sales & marketing, project management and development.

Mr. Goldner is responsible for technical development, production and customer projects. He studied engineering computer science at the University of Paderborn as well as a diploma thesis at Infineon Technologies in Munich.

Antonio Bossi, Non Executive Director

Bringing over 25 years of experience in corporate finance, equity capital markets and M&A, including over seven years with ING Barings and ABN AMRO working mainly in the utilities, energy and renewables sectors.

Currently, Mr. Bossi is Corporate Finance Director at WH Ireland having previously spent 18 years with Stockdale Securities and its predecessor companies. He is an Italian national and an engineer by education, having studied at Politecnico di Milano.

Ali Naini, Non Executive Director

Co-founder and Managing Director of Turquoise International Limited, financial advisers and investors in climate technologies. Experience includes establishing and managing two ERDF-backed Low Carbon Innovation Funds; work with a variety of ClimateTech companies; 10 years as co-founder and chairman of Controlled Power Technologies; 10 years as exclusive financial advisor to Anglo Platinum on ClimateTech matters. He has also worked in energy project finance and privatisation at Close Brothers, Flemings and PwC.

Mr. Naini holds both undergraduate and postgraduate degrees from the London School of Economics.

Established Market Traction

Stationary		Automotive		Rail		Maritime	
							
GKN HYDROGEN	31	trucks europe	21	LINSINGER	1	FINCANTIERI MARINE GROUP	3
DB Bahnbau Gruppe	26	ELECTRA	1			torqeedo	1
Shell Hydrogen	3	MAGNA	1			ACUA OCEAN	1
wilo	3	ŠKODA TRANSPORTATION	1				
APEX energy solutions	6						
VONOVIA	1						

In discussion

Kraftanlagen ENERGIES & SERVICES

TOYOTA MATERIAL HANDLING

HÖRMANN VEHICLE ENGINEERING

Goldhofer

The grey circles listed are the number of ordered fuel cell systems per the customer. For special plant applications (like HyShelter®) the number of integrated fuel cell systems were counted.

Market Opportunity

Established and Growing Hydrogen Fuel Cell Market

Substantial and growing addressable market opportunity

- Global fuel cell market valued at $3.6bn in 2020*
- Global market projected to reach $32bn by 2030*
- 73% growth in fuel cells shipped in 2021 vs 2020 to 2313MW*
- 11% growth in fuel cells shipped in 2020 vs 2019 to 1192MW
- PEM Fuel Cell market seeing highest growth and adoption

Total Addressable Market by 2030

Diesel Engines Market: £220 bn Addressable Market in 2030

Maritime (£bn)		Stationary (£bn)		Rail (£bn)		On/Off Highway (£bn)	
Inland	6.4	UPS	47.6	Passenger Trains	7.2	On highway	78.8
Sea based	10.1	Regen Systems	20.5	Maintenance Trains	7.0	Off highway	3.5
		Containerised Systems	38.9				
Total £bn	**16.5**	**Total £bn**	**107.0**	**Total £bn**	**14.2**	**Total £bn**	**82.3**

*Sources: *Fuel Cell Market Growth Analysis-2030 | By Type, Application (alliedmarketresearch.com), E4tech annual Fuel Cell Industry Review, Global Market Insights, The Fuel Cell Industry Review 2020*

Market Demand Drivers

Legislation, Regulation, Political Risk & Energy Security

- Climate change targets driving international, regional and country legislation
  - International legislation to reduce maritime GHG emissions
  - Introduction of Clean Air Zones in urban areas, penalizing diesel vehicles
  - Banning the sale of new diesel engine vehicles (Norway 2025, UK 2030-35)
  - Governments incentivising hydrogen transition
- Reduction of reliance on oil and gas imports from Russia

Commercial & Product Advantage

- Oil & gas to be used for higher value petrochemical products
- Hydrogen fuel costs decreasing with renewables production
- Extensive application in target addressable markets
- Low maintenance costs and high reliability compared to combustion engines

Differentiated Technology

Technological Edge

FC Types	Fuel	Temp.	Pros	Cons
AFC Alkaline Fuel Cell	H2	≤ 80°C	• Dynamic operation • Start/Stop capability • High el. Efficiency • Emission free	• High H2 purity • High O2 purity • Low lifetime
PEFC Polymer Electrolyte Fuel Cell	H2	≤ 80°C	• Dynamic operation • Start/Stop capability • High el. Efficiency • High lifetime • Emission free	• High H2 purity
PAFC Phosphoric Acid Fuel Cell	Reformate	≤ 200°C	• Low H2 & O2 purity	• Low Dynamic operation • Start/stop capability • Low el. Efficiency • Low lifetime • Emissions
MCFC Molten Carbonate Fuel Cell	Reformate	≤ 650°C	• Low H2 & O2 purity	• Low Dynamic operation • Start/stop capability • Low el. Efficiency • Low lifetime • Emissions
SOFC Solid Oxide Fuel Cell	Reformate	≤ 1000°C	• Low H2 & O2 purity • High Lifetime • High el. efficiency	• Low Dynamic operation • Start/stop capability • Emissions

Market Leading Technology and Products

Reliable and Efficient

- High reliability in operation and long service life of > 20,000 hours
- High efficiency: Stack electrical efficiencies of between 47% and 67%
- Low operating temperatures of between -35°C and +45°C
- Multi-application (stationary, automotive, maritime and rail)
- Liquid cooling (simple use of reaction heat)
- Systems require no external humidification and operate at low pressure

Cost effective and flexible

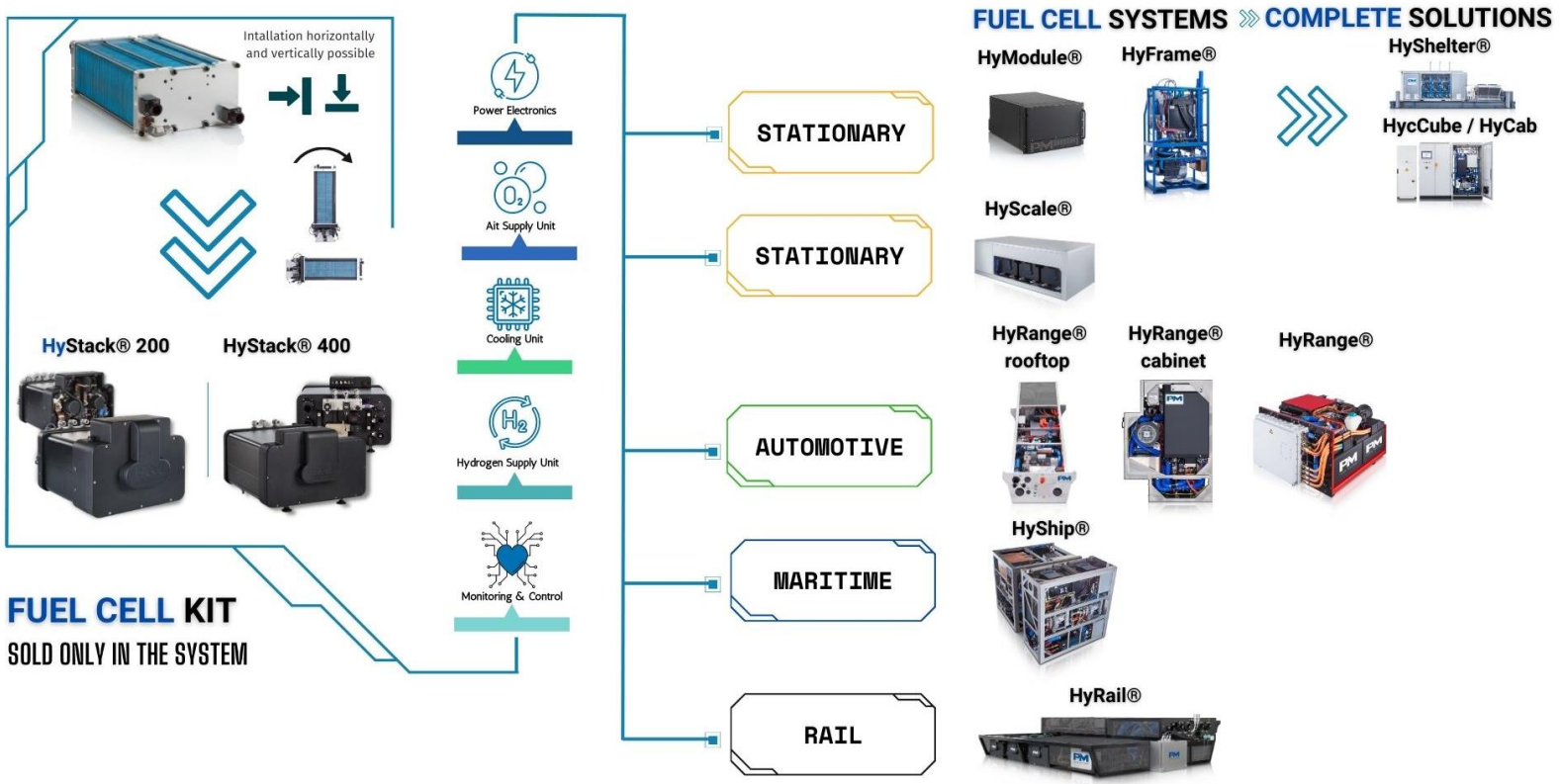
- Lower hydrogen consumption
- Easy maintenance due to interchangeability of cells
- Live monitoring and diagnostics during operation
- Installed and operated vertically and horizontally – unique to PEM fuel cell stacks

Certified - International safety standards bodies

- CE-mark
- International Electroctechnical Commission IEC 62282-2

  (Fuel cell modules-Safety Standard)

Proton Motor PEM Fuel Cells: Flexibility Product Offer



- Can replace diesel engines in **ALL** of their current markets
- Focused on long life applications inside addressable markets
- Trade off between cost and power density across range and product

DIFFERENTIATED TECHNOLOGY

Clear Strategy & Path to Growth

Creating Value With A Clear Growth Strategy

Leverage proven products, receiving repeat orders from blue-chip customers

Develop routes to market through 'go to market strategy'

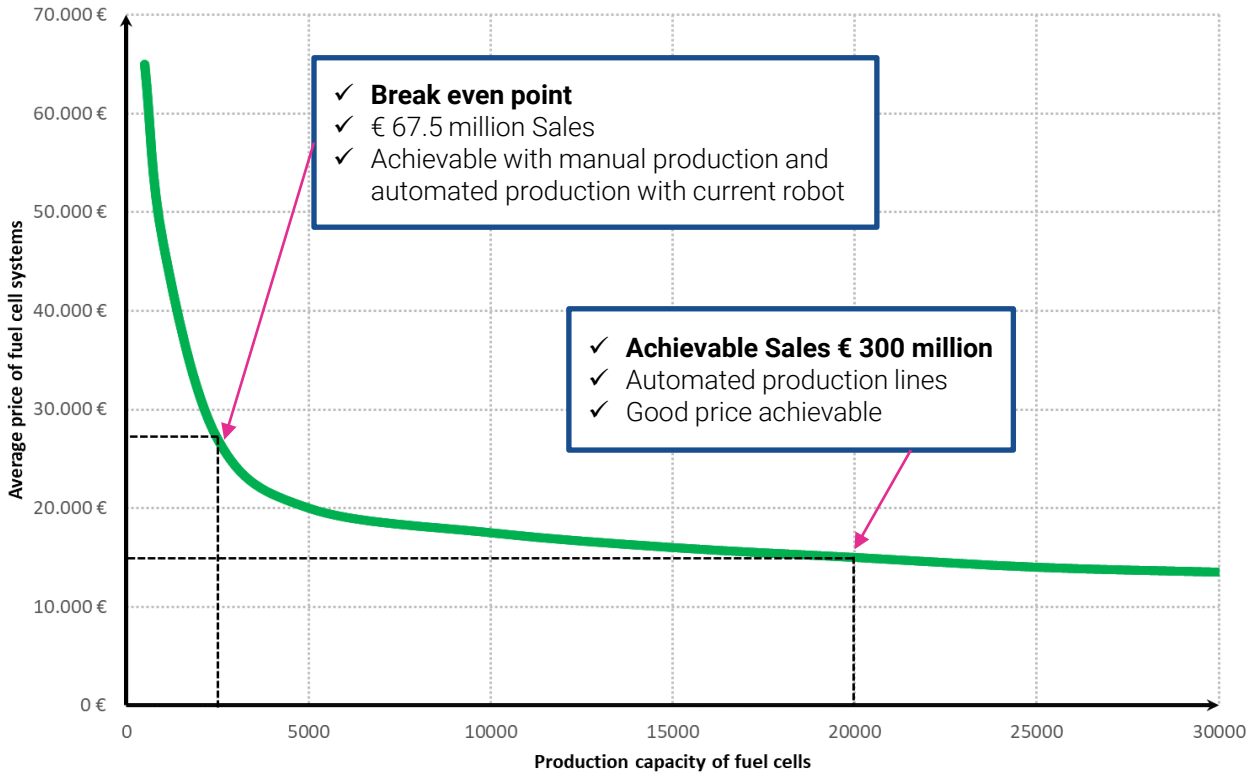
- Initial focus mainly on European market: due to scale, opportunity and accessibility
- Targeting early adoption markets with applicable energy requirements: stationary, mobile, rail & maritime
  - Leverage current relationships with existing customer and adapt portfolio accordingly
  - Develop 'Know your customer and know your buyer' through:
    - Matching evaluated customer demand to technical development roadmap
    - Identifying and targeting customers within the sub-segment markets by matching product offer to ideal customer profile
    - Aligning marketing plan to penetrating through to identified target customers
    - Coaching and training of sales and sales related staff
- Secondary focus on worldwide mass adoption market for fuel cells

Scale production and reduce unit cost

- Increase production capacity from 5,000 stacks p.a. to 30,000 stacks p.a.
  - Signed lease on new 13,500 m2 factory
  - New production line / test benches / expand production space
- Increase production beyond 30,000 units per year via IP licencing:
  - Licencing / contract manufacture for production of fuel cell systems & container applications
  - Licencing / contract manufacture for production of fuel cell stacks

Path to Profit

Indicative Price / Volume curve



20,000 fuel cells p.a. delivers sales revenue of c. €300m @ €15,000 per unit ave, representing a small % of the addressable market

Trucks Produced in Europe 2021

301,000

Average Power per Truck

300 kW

Needed Fuel Cell Production Capacity

90,300 MW

Production Capacity Proton Motor

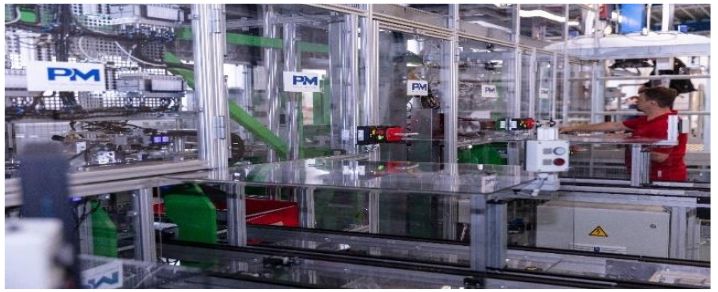
2,500 pcs. → 90MW

20,000 pcs. → 720MW

Fully Automated Fuel Cell Stack Manufacturing





Current Robot Capacity	Increasing Market Demand		
FC capacity 180 MW_{el}: *5,000 pcs. HyStack® 400/120*	→	*FC capacity 1.080 MW_{el}:* *30,000 pcs. HyStack® 400/120*	→

Increasing capacity and efficiency:

- Reduce end of line testing time
- Integrated sealing
- Automated bonding

Financials

Income Statement

	30/06/2023 6 months Unaudited £000	31/12/2022 12 months Audited £000
Revenue	929	2,088
Cost of sales	(914)	(2,089)
Gross Profit/(Loss)	15	(1)
Other operating income	98	604
Administrative expenses	(6,213)	(11,057)
Operating loss	(6,100)	(10,454)
Non-operating income/(expense)	556	(8,450)
(Loss) attributable to shareholders	**(5,544)**	**(18,904)**

Balance Sheet

	30/06/2023 6 months Unaudited £000	31/12/2022 12 months Audited £000
Cash and cash equivalents	2,662	2,720
Inventories	2,469	2,302
Trade and other receivables	1,052	946
Current assets	6,183	5,968
Non-current assets	13,271	2,638
Total assets	**19,454**	**8,606**
Trade and other payables	(4,072)	(4,657)
Borrowings	(432)	(466)
Lease debt	(742)	(215)
Current liabilities	(5,246)	(5,338)
Borrowings	(108,415)	(103,007)
Lease debt	(11,045)	(252)
Non-current liabilities	(119,460)	(103,259)
Total liabilities	**(124,706)**	**(108,597)**
Equity	**(105,252)**	**(99,991)**

Share Register

As at 14 September 2023

Shareholder	Shareholding no. shares	% of issued share capital
SFN Cleantech Investment Ltd	895,700,056	57.6%
Falih Nahab (direct ownership)	381,028,416	24.5%
Other shareholders with <3% shareholding	277,192,700	17.8%
Total number of shares in issue	**1,552,206,354**	**100.0%**

Directors' shareholdings	Shareholding no. shares	% of issued share capital	Warrants / Options
Faiz Nahab (via SFN Cleantech Investment Ltd)	895,700,056	57.6%	10,000,000
Helmut Gierse	8,548,502	0.6%	1,350,000
Antonio Bossi	498,004	<0.1%	–
Roman Kotlarzewski	450,000	<0.1%	500,000
Manfred Limbrunner	225,000	<0.1%	1,370,000
Sebastian Goldner	310,000	<0.1%	389,250
Total number held by directors	**905,731,562**	**58.3%**	**13,609,250**

Summary

Conclusion

Uniquely well placed to take advantage of the acceleration in the adoption of fuel cells to meet existing and future energy needs across its core target markets, based on:

- **Proven and tested Products:**
  - Over 25 years of imbedded validation
  - Clearly defined commercial advantage based on cost & flexible benefit across target applications
  - Independent certification & IP protection
- **Clear route to market through established and trusted relationships with 'blue-chip' customers**
- **Clear scale-up strategy to meet demand:**
  - Existing production – manual and automated to meet existing & near-term requirements
  - Expansion of automated production to meet wider product demand
  - Licence model with trusted and established supply chain to expand production further
- **Strong financial and investor support to meet investment and scale up requirements**
- **Clear path to break-even and growing profitability:**
  - Scale up and economies of scale

Proton Motor represents the highest growth and lowest risk way to invest in the mass adoption of hydrogen fuel cells

Contact Details

Proton Motor Power Systems PLC

Investor Relations

Celicourt Communications

Mark Antelme / Philip Dennis

Tel: +44 (0)20 7770 6424

Email: protonmotor@celicourt.uk

www.proton-motor.de