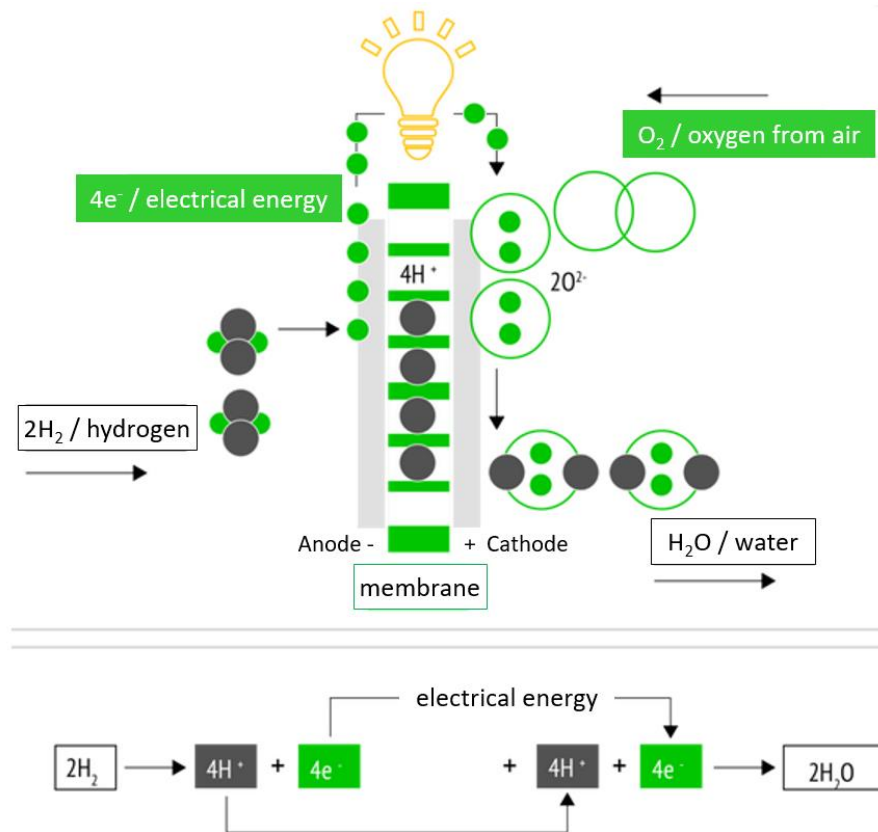


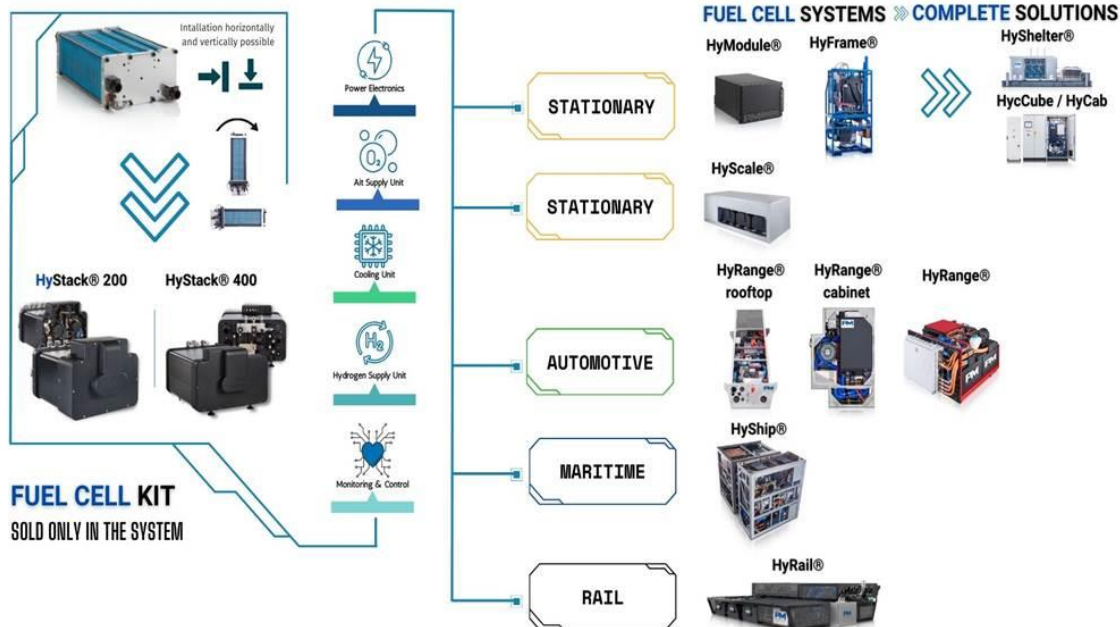
## Q&A\_TECHNOLOGY

- How does a fuel cell work? How does it feed electricity into a vehicle? How does it supply a house or power station with heat or secure an interlocking system or data centre?



The construction of a hydrogen fuel cell is relatively simple. It consists of two electrodes separated by a membrane. On the anode the energy carrier hydrogen is supplied as fuel and on the cathode oxygen from the air as reaction gas. The membrane itself is coated with a catalyst. This ensures that electrons are split off from the hydrogen molecule. The membrane is permeable to the hydrogen protons that are produced in this process. These move to the cathode and react there with the oxygen in the air to form water. During the reaction, the split-off electrons are needed again. These move to the cathode via a closed electrical circuit. This current flow can be used as electrical energy.

In a vehicle, the electrical energy can be used, for example, to charge a battery or directly for the electric drive. In stationary applications, such as the energy-autonomous supply of a house or building complex with electricity and heat, the fuel cell ensures emission-free living with renewable resources. In applications to secure critical infrastructures such as interlocking systems or data centres, hydrogen fuel cells are used instead of diesel generators to generate CO<sub>2</sub>-neutral energy.



- What establishes Proton Motor Fuel Cell GmbH's unique selling point in the market? How do you intend to maintain and expand this?

With its 25 years of industry experience (1998 to 2023), Proton Motor Fuel Cell GmbH, headquartered in Puchheim (Bavaria) plus an additional manufacturing site also near Munich, which is an operating subsidiary of the English listed parent company "Proton Motor Power Systems plc" (ticker symbol: "PPS" / WKN: A3DAJ9 / ISIN: GB00BP83GZ24), is positioned in the European B-to-B markets as a developer and manufacturer of fuel cell stacks and complete solutions.

Our frost-bearing and frost-starting models with cell stacks made of graphite bipolar plates, which are designed for long service life, also have the major advantage that they can be installed in two ways – horizontally and vertically. Some of the components and complete solutions are designed with suppliers, with Proton Motor being responsible for software programming and control. There is a clearly defined development roadmap for this decade, which also specifies the transition from medium volume production to series production. This step is to be realised in co-operation with licensees and through joint ventures.

- What are the advantages of automated manufacturing equipment for series production?  
The international team for the "Fit-4-AMandA" (Fit for Automatic Manufacturing and Assembly) project was provided by Proton Motor Fuel Cell GmbH as stack manufacturer, IRD Fuel Cells A/S as component manufacturer, Aumann Limbach-Oberfrohna GmbH as manufacturer of automated assembly systems, UPS Europe SA as potential user, as well as the Fraunhofer Institute for Machine Tools and Forming Technology IWU and the Chemnitz University of Technology / Chair of Alternative Vehicle Drives (ALF). The project management is carried out by Uniresearch B.V.

*The biggest advantage of the production plant, which has been financed by the EU funding program "Fuel Cells and Hydrogen Joint Undertaking" (FCH JU), is the greatly reduced production time of one cell and thus of an entire fuel cell stack. Due to the reduced production times and the resulting quantities, the manufacturing costs of a fuel cell can be reduced.*

- **What are Proton Motor's production prospects and goals? Do you expect a boom in demand in the medium term? When will the technology become established in passenger cars?**

*Proton Motor Fuel Cell GmbH intends to increase its annual production capacity to 5,000 fuel cell stacks incl. associated systems and gradually up to 30,000 fuel cell stacks in the future. The exponentially increasing demand for our hydrogen fuel cell technology has been at a steadily growing high level in recent years, at which it is estimated that it will remain for the time being.*

*At Proton Motor, we do not focus on the automotive sector or passenger car market. The focus of our hydrogen fuel cell technology is on heavy duty such as municipal, logistics and fleet vehicles. Generally, it can be said that there will not be one technology in the future. Rather, there will be a multitude of different technologies on the market. One of them will be the hydrogen fuel cell.*

- **What are the advantages of the fuel cell vehicle including the "HyRange®" range extender system compared to battery-powered electro mobility?**

*The great advantage of fuel cell powered commercial vehicles such as e-waste collection vehicles, trucks or buses is their range. Because hydrogen can be filled up, the full range of the vehicle is restored within minutes. This is not possible with batteries. In addition to the use of the fuel cell as the main energy supply in the vehicle drive train, there are various other hybrid concepts in which a fuel cell is combined with a battery. The so-called range extender concept "HyRange®", as it has been used for years by Proton Motor Fuel Cell GmbH for numerous contract projects, has recently attracted a great deal of attention.*

*In order to ensure that the guiding principle can be applied across the board, it is in principle necessary to dynamically advance the expansion of the hydrogen filling station infrastructure that has already begun. The main statement we would like to make on this issue is that Proton Motor is active in almost all mobility sectors. In addition to rail applications, we are increasingly receiving inquiries from the maritime segment.*

- **Is hydrogen technology currently experiencing a key moment and if so, why?**

*The technology of the future is gaining momentum as politics is setting the course by developing and in some cases already adopting regional, national and European hydrogen strategies to give hydrogen a key role as an energy carrier for achieving climate goals.*

*The increasing number of inquiries for our hydrogen fuel cell solutions "Made in Germany" reflects the broad market environment, which is establishing itself through the stationary, heavy duty, rail and maritime sectors. Special market mechanisms are always dependent on a multitude of parameters. The hydrogen issue is becoming socially acceptable through political bodies, although Germany – despite its technological leadership – has a lot of catching up to do, especially in terms of industrial decarbonisation.*

- **How do you manage the challenges caused by the energy crisis in your company?**

*The energy turnaround is central to a secure, environmentally compatible and economically successful future. To this end, Germany and Europe's energy supply will be fundamentally transformed. Away from nuclear, towards renewable energies and more energy efficiency. We see Proton Motor's corporate strategy as an instrument for achieving the international climate targets that were agreed well before the Corona crisis.*

*However, concrete steps have been more quickly backed up with financial resources by economic stimulus packages that have been passed. What matters now is that funds are distributed to the right addressees by means of support programmes. At the new modern additional site for production and capacity expansion, energy self-sufficiency will play a central role in industrialisation and serialisation at Proton Motor.*

- **Which topics and technological developments are you currently particularly concerned with? What are the main challenges facing your customers today?**

*The general increase of power densities within the product portfolio is a self-evident measure for us. At the same time, quality management and cost reduction are just as much a part of our efforts as are the extension of the service life and environmentally friendly recyclability of Proton Motor fuel cells. On the latter point, for example, there was the sustainability study "BReCycle" with the Fraunhofer IWKS (Institute for Materials Recycling and Resource Strategy).*

*The excellence of Proton Motor's engineering quality includes customised order processing. Because we offer fewer hydrogen fuel cells "off the peg", we are able to respond to customer wishes and specifications in a highly flexible, individual and equally proactive manner. Very often our customers act in co-operation with other players, for whom Proton Motor has proven itself in recent years as an experienced team member in joint order processing. In any case, there have been several follow-up orders because the cooperation was judged to be highly effective.*

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