

Metacon Insights 1

Information and updates about our business



For those of you who are interested in the hydrogen industry in general and in Metacon in particular, we think it can be interesting to sometimes hear about things that concern our business in general and that are not only related to things that we are obliged to communicate. We therefore want to start sharing our experiences, things that happen in our everyday lives and things that we capture around the world that affect hydrogen development in our societies. We have chosen to call it "Metacon Insights".

First of all, it's great to see and be part of the rapid development in the hydrogen field. With each passing day, it becomes clearer to us that hydrogen offers unique and concrete opportunities for all countries in the world to solve common challenges and achieve our goals regarding the transition of various fossil-dependent sectors. The technology works and, in many cases, can be profitable for customers today. With the same industrial logic, this can be shown to apply many times historically, reasonably only getting better with increasing volumes and a growing market.

I sometimes wonder what Thomas Alva Edison was thinking when, in April 1892, he joined forces with Charles A. Coffin and J. P. Morgan to found the General Electric Co., a company in which I had the privilege of working for ten years in my earlier career. While they had a start-up capital of a whopping \$37 million, which was a considerable amount at the time, the challenges were very similar to what we're facing now. How could they quickly introduce a

completely new technology into an immature market to produce electricity for light bulbs and all the electrically powered machines that were "in the pipeline"? Just as there are now both high-performance hydrogen vehicles and high industrial demand for green hydrogen, so Edison & Co. had both light bulbs and electric machines. But who would produce the electricity on a sufficient scale and who would manufacture and build the electricity generators? General Electric invested in the generators, which must be seen as a smart move that led to the company's success story. They chose the same strategy as those who sold tools and shovels to the gold miners during the gold rushes of the 1800s.

Metacon will first and foremost sell the "shovels". We manufacture and sell different types of hydrogen generators, filling stations and other accessories to those who are now investing in the hydrogen society, and although nothing is easy, I am convinced that it is the right way forward. There is nothing to prevent us from updating or supplementing our strategy in the future when we know even more.

Hydrogen generators based on electrolysis technology are tried and tested and are the main source of knowledge on the market. Our own reforming technology, which we call HHG, is a unique complement for the production of hydrogen from fossil-free input raw materials other than electricity and which works even when there is no access to green or cheap electric power. We strongly believe in the possibility of selling our HHGs to buyers who have access to or the ability to produce biogas, but also for other applications such as ammonia in shipping and ethanol for off-grid plants.



Hydrogen refuelling station for passenger cars (70 MPa) and heavy-duty vehicles (35 MPa).

What we have learned so far is that things take time, often a long time. We are in uncharted territory, but we have now come a long way. We have been involved in delivering and building the first truly green hydrogen plant in Sweden for the production and refuelling of hydrogen

from its own wind power. Most existing filling stations in the world purchase their hydrogen from various suppliers and it is not certain that this hydrogen is produced fossil-free. We see great advantages with our integrated solution with local production to one or a number of nearby filling stations, and we believe that our customers also see this.

Metacon is strongly committed to the green transition, and we see our business as an important and significant cog in the large machinery for transitioning energy use from fossil to non-fossil fuels. With our mix of scalable products, we feel that we can play a significant role in this transition.

Our products are scalable to work both in environments where access to raw materials is limited and where large "gigawatt" plants are needed. Our smaller installations can work with one or a small number of wind turbines or a solar park that is advantageously supplemented with cheap electricity during times when electricity production is otherwise high, but demand is low. Our HHG systems work in environments where access to electricity is limited and also with a variety of fossil-free input raw materials such as biogas from agriculture, the food industry or wastewater treatment plants.

We are now seeing an increasing interest in everything related to hydrogen in society, including from politicians in Sweden and in other countries. More and more commercial vehicles for road transport are now being launched with hydrogen propulsion in various forms and will require opportunities to refuel with hydrogen. The EU has launched its new financing project, the Hydrogen Bank, and in the US, the Biden administration has just set aside \$7 billion to support hydrogen production. We will of course be part of this journey.

Service stations in Älghult

One of the most enjoyable events of the summer was the inauguration of the filling station in Älghult together with Uppvidinge Vätgas. It is unique in that the electrolyzer primarily gets its electricity from Uppvidinge Vätgas's own wind turbine. About 200 people from all over Sweden participated on site and refueling was carried out of both hydrogen trucks from Volvo Trucks and passenger cars from Toyota and Hyundai.



Volvo refuels its hydrogen truck in Älgö, Sweden



Maria Arnholm, Mayor of Kronobergs Län, fills a Toyota Mirai in Älgö.

The integrated filling station has attracted a great deal of interest and serves as one of our demonstration plants in collaboration with Uppvidinge Vätgas. Since the inauguration, a number of company visits have been made to learn more about the facility and how to think in similar situations elsewhere.

Botnia Hydrogen

The work to deliver the next plant in Sweden is now in full swing. Next in line is our customer and associated company Botnia Hydrogen, which has ordered two filling stations and two electrolyzers for Piteå and Arvidsjaur. The equipment has arrived in Sweden and has been with us in Finspång for some time for inspection and technical preparation before delivery to the customer. The facilities consist of two electrolyzers and two complete filling stations. At the same time, earthworks are underway on site in Piteå and Arvidsjaur prior to the construction of the facilities.



The electrolyzer in Finspång



Groundwork from Piteå

Biogas to hydrogen in Kempen

The work to deliver a Reformer (HHG50) to our partner in Kempen in southern Germany is in full swing and the plant is expected to be ready for departure from Greece shortly. The plant will be built at the municipal wastewater treatment plant outside Kempen, where the groundwork work is now nearing its final stage. The facility is built in our newly designed container unit that can easily be transported by truck. Once it is in place, we will be able to carry out ongoing testing and optimization as well as utilization as a demonstration plant for potential customers both from Germany and other countries, and the interest is great.



Reformer HHG50 from Helbio during transport and from the inside



PEM electrolyser and filling station to Slovakia

In March this year, we announced a deal with our customer Hydroholding in Slovakia.

The order is for a 1 MW PEM electrolyzer with associated filling station. The plant is now being delivered on ships from China to Slovakia.



Green hydrogen from ethanol

As many of you who follow us know, we have a special project going on together with our customer WattAnyWhere in Switzerland who has ordered an ethanol reformer for the production of electricity, heat and water to places where there is a shortage of electricity or where the price of electricity is relatively high. The plant will be integrated with WattAnyWhere's fuel cell-based electricity generator for the production of electricity for vehicle charging. But also, for electricity production for so-called "microgrids". Residual

products in the form of heat and water must also be able to be utilised if necessary. The project is exciting and innovative, and work on the completion of the next unit in the development series is ongoing at our facility in Patras.

Marine applications

As is well known, our reforming technology has potential in several technical solutions for the sustainable transition in the marine world. The development together with our Norwegian company in ammonia for deep sea shipping, Pherousa Green Technology ("PGT") continues. PGT is in an active and challenging phase with design and feasibility studies for the six dry cargo bulk carriers to be ordered by Pherousa Green Shipping and as previously communicated, the company is working on the development of the propulsion model and aims to be able to contract necessary partners. This is a relatively large project for PGT, and the development work is technically complex and still in an early phase. For a few years now, our engineers in Patras have developed a well-functioning prototype system that shows that our reactor is capable of reforming ammonia into hydrogen that can be used for both combustion engine-based and fuel cell-based powertrains using ammonia as fuel. The work that remains is to further develop this smaller prototype into a significantly larger technical solution that will also be able to work on board large ships. We will return with more information about this exciting area as soon as more concrete development steps have been taken.

Our new factory in Greece

At the same time as we are delivering and installing various projects, we are also in the process of completing our new development center and factory in Patras in western Greece.

The work is in full swing and means that many of our Greek employees are busy with this work. We are really looking forward to inaugurating the factory when everything is in place and that further development and manufacturing of new HHG systems can continue in more suitable premises.

Until now, our existing premises have only had capacity for single production and have not had room for full-size containers. In practice, it has thus been possible to carry out development and testing activities in these and everything of a larger scale has had to be done externally by others.

In our new factory, we will be able to scale up operations to be able to build about 20 complete HHG250 reactors a year, as well as reactors for ethanol and ammonia, etc., as new solutions become available.





New factory in Patras

In conclusion

I hope that with this first Metacon Insights we have given a picture of our business in general and much of what is going on, that we can tell you about at the moment. The market is out there, even if it always takes more time in the beginning when new "ecosystems" and new infrastructure are to be built. Our customers are often pioneering companies with limited know-how and are dependent on venture capital, and even if they are not, the projects may still be initially dependent on hopes of contributions. In addition, some customers are in uncharted territory and may not always have 100% ensured that they can find customers for the hydrogen they will produce. It is also a matter of new material for authorities in different countries, and permit processes can be long and extensive. As I mentioned at the beginning, it's a bit of a "chicken and egg" problem. But in the light of the collective amount of investments that are now being made in Sweden and other countries, it seems indisputable that the area is on its way to becoming large.

I look forward to comments and opinions and if we feel that this will be an appreciated format, my goal is to come back with Insights early in each quarter or when it feels relevant for other reasons.

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