



MAKERS OF GOO

10 minutes with...Dr. Werner Ponikwar, Linde Hydrogen FuelTech GmbH

By Stephen Harrison | 16 March 2020

Just south of Munich is a suburb where Carl von Linde began his work to develop refrigeration cycles that would to keep the Bavarian beer cool in summer. That was more than a century ago.

In this location today stands The Linde Group's business, engineering and technical complex at Pullach, the workplace for more than 2,000 people in the mainstream Gases and Engineering divisions.

It is also home to several leading members of the Linde Hydrogen FuelTech team. **gasworld** spoke exclusively to one such individual, Dr. Werner Ponikwar, Managing Director Linde Hydrogen FuelTech GmbH, to find out more about a highly focused hydrogen mobility business which is really 'on the move'.



Source: Linde

Thanks for taking 10 minutes out with gasworld. Let's rewind a little here and ask, what did Praxair and Linde each bring to the hydrogen fuelling business that now exists in The Linde Group?

Linde has an established pedigree in hydrogen mobility. We have installed more hydrogen filling stations for cars, buses, forklifts and just lately trains worldwide than any other player.

We entered this market through expertise in high pressure technology that existed in one of our teams in Vienna. Praxair, on the other hand,

has for many years been supplying hydrogen to filling stations in the US and other countries, but had not found the right technological entry point. So, the current organisation is a combination of our will and ambition with a legacy of Linde technology.

So, who was the champion for hydrogen within Linde?

Without a doubt, Prof. Dr Wolfgang Reitzle was instrumental in driving Linde into that pole position. He came from the automotive industry and had an intuitive feel for how hydrogen mobility could, one day, help to transform our world. He was a true visionary who was willing to invest in this area. He wanted to demonstrate the potential of a concept that could be transformational for the energy sector, and indeed our industrial gases industry, in the long-term.

And who will take on that leadership role in The Linde Group in the future?

Our Board of Directors is very much aligned on the importance of being not only part of this journey but also a key driver. Hydrogen as energy carrier was and is one of the key strategic topics for Linde. Within a short period of time after the merger completion, the Board has become a strong supporter of our activities and growth plans in the hydrogen mobility market.

I must add here that the whole merger process is moving extremely well. The collaboration is first class and we are making new friends and learning from each other on daily basis.



Source: Linde

Linde Group Ionic Compressor 90

You mentioned that Vienna is an important location for your team.

Yes, indeed; let me explain. We have two important locations connected to our two key technologies, that both enjoy a high market reputation: the Cryo Pump and the Ionic Compressor. Cryo Pump stations convert low pressure liquid to compressed gaseous hydrogen, and they were invented in Pullach. Vienna is the home of the Ionic Compressor stations, which efficiently compress gaseous hydrogen to high pressures. In fact, they started their journey in automotive fuels with compressed natural gas (CNG) and then migrated into hydrogen. Talking about Vienna, this is also where our serial production and the headquarters of Linde Hydrogen FuelTech are located.

Safety is a key topic for hydrogen. What measures does Linde take there?

First and foremost, safety is the most important topic in everything we do at Linde and is paramount for our filling stations as well. We actively share our knowledge through safety and standards committees such as the EIGA Working Group 11, which coordinates safety practices for hydrogen energy. It includes automotive OEMs and leading industrial gas companies.

We want hydrogen to be a safe and convenient fuel that is accepted by the masses and embraced by the politicians. A small incident involving any player in this space can dent the perception of hydrogen's safety. So, we are very keen to raise the bar here for everybody.

Beyond EIGA, what other organisations do you participate in?

Linde was a founding member of H2 Mobility in 2015. The goal of that joint venture is unconditionally to build 100 hydrogen fuelling stations in Germany, which would represent a basic infrastructure and coverage. This should give OEMs, the public and commercial transport operators the confidence to invest in developing and purchasing hydrogen-powered vehicles.

We had the vision to break out of the chicken and egg problem and decided to 'just do it'. We did not enter into this venture with a short-term business case: we set out to prove a concept in one country and that is what we will do.



Source: H2 Mobility / Danny Gohlke

So, where do you see the advantages of FCEVs and BEVs?

We are passionate advocates of hydrogen mobility. And at the same time, we recognise that BEVs also have their strengths. I can imagine that both technologies will develop side-by-side. For example, I foresee fleets of app-controlled, battery powered autonomous taxis hooked up to power points in cities in the future. On the other hand, in rural areas or for heavy vehicles where range and power are important, hydrogen is in its element.

Indeed, and hydrogen is a truly fascinating element. What comes next?

We have several new developments in the pipeline to support current and future market requirements. For example, we have just recently

received the certification of our calibration system that allows us to offer fully certified and calibratable hydrogen dispensers. This is a legal requirement in Austria, for which there has been an exemption for many years because nobody could figure out how to measure the hydrogen flow accurately enough.

It sounds simple, but it is really a very complex technical problem. However, our team has found a solution and we will retrofit that in our filling network as required.

And beyond the DACH (Austria, Germany, Switzerland) region? What plans do you have?

We are active members of the Hydrogen Council which is an international forum to promote hydrogen as a fuel. The big energy companies, industrial gases majors and some well-known auto brands all get together to share their enthusiasm with politicians and present a realistic vision of how hydrogen can shape a greener future for our planet.

There is also a lot of interest in the H2 Mobility infrastructure development from some Asian countries, and we want to support those developments in a commercially viable manner. Let's see how quickly they can catch-up with, or perhaps overtake, the scale of the hydrogen filling network here in Germany.