



Industrial gases fulfilling their potential in human health and decarbonisation

By Stephen B. Harrison | 15 July 2020

Thirty years ago, almost to the day, I joined BOC Gases in the UK. I had completed my Chemical Engineering Masters degree at Imperial College and I was looking forward to setting out on my career.

I was not exactly clear how I could make a positive difference in the world, but I knew that I wanted to – in some way.

Thirty-six years ago, Gorbachev and Reagan held a historic meeting in Reykjavík. It was a brave step towards international security and nuclear disarmament. They certainly made a difference in the world. They rose to the defining challenge of their generation.

Right now, we are grappling with two defining challenges of our generation: the coronavirus and climate change. My belief is that the industrial gases industry can make a unique contribution to these two issues.



On the coronavirus, remarkable actions have been taken by many people in and around our industry to ensure that medical oxygen can reach Covid-19 patients. Here are three examples from many that I could mention. Firstly, when it became evident that we would need to ramp up medical oxygen supplies in Europe, EIGA revised the guidelines on the supply of medical oxygen. Safety remained the priority and some intelligent temporary changes were made to ensure that additional oxygen could enter the supply chain to reach patients. Lives have been saved.

Secondly, our sector has rallied around to make liquid oxygen available to field hospitals and expand supplies to established hospitals. The tanks that have been installed had, in some cases, been allocated to other projects. Through a collective focus

on the issue in hand, priorities were juggled, plans were changed, and the hospital oxygen tank installations went ahead. People pulled together to do the right thing. More lives were saved.

Thirdly, the potential for PSA oxygen to supplement liquid oxygen supply to hospitals has been recognised and the EDQM recently initiated a process to create a new monograph for 98% oxygen. This would enable a wider range of PSA equipment to be used to make medical oxygen. In Europe, we have been fortunate that cylinder and liquid medical oxygen supplies have continued to flow and in many countries the infection rates are now falling. But the WHO has highlighted the need for more oxygen concentrators. The work that began in Europe on this new monograph may have relevance internationally.

Many of our colleagues around the world have been applying their energy and ingenuity to ensure that medical oxygen reaches patients. They might have been working like super-heroes, but they have not been immune to the virus, as the recent death of Stewart Dow to Covid-19 reminded us. He was a champion of hydrogen and a colleague of mine for many years at BOC Gases in the UK.

In addressing the second defining challenge of our generation, as Stewart's work in hydrogen underlines, our industry also has expertise that can help to make our planet carbon neutral. Covid-19 is an acute problem. But climate change is a chronic issue that cannot be ignored.



Source: Linde

Although I am sure nobody would ever have planned things to be this way, the coronavirus pandemic might have boosted the emerging role that hydrogen will play in mitigating climate change through decarbonisation. For example, the Next Generation EU recovery plan has committed significant funds to hydrogen as a renewable energy source.

Additionally, in Germany, where I now live, a post-Covid-19 economic stimulus programme has promised billions of Euros for green hydrogen. This long-term investment will create jobs and support a carbon-neutral future.

Let me bring this back to the world of industrial gases. We are the engineers who design and operate mega-scale ASUs which supply oxygen to gasification units that make hydrogen from coal and waste materials such as petcoke. When gasification is combined with CCS, the hydrogen can be produced in a low-carbon way.

We are the masters of hydrogen production from natural gas on steam methane reformers. Again, combine this with CCS and we have a route to low-carbon hydrogen. Furthermore, many industrial gases companies are getting closer to electrolyser technologies which can convert renewable power to green hydrogen.

Some of these hydrogen production pathways will be important bridges on the way to full carbon neutrality, others could still be part of our energy mix hundreds of years from now.

When it comes to working together internationally, regions that are blessed with abundant sun, wind or hydro-electric power will undoubtedly become hydrogen exporters. In Germany, it is anticipated that we will need to import two thirds of our energy in the future. In some cases, pipelines will be used to transport hydrogen gas. And for other trade routes, the shipping of cryogenic liquid hydrogen will become common, like we move liquefied natural gas around the world today. When it comes to the liquefaction of gases and handling of cryogenic fluids, the industrial gases sector has the necessary expertise.

In mobility applications, hydrogen gas is stored as a fuel on cars, trucks, buses and boats in high pressure cylinders at up to 700 bar. The expertise required to manufacture fuelling stations which can deliver hydrogen to this pressure resides in the industrial gases value chain. As does the competence to produce lightweight gas cylinders that can store hydrogen safely at 700 bar.

These are some of the reasons that I am convinced that we, the generation working in industrial gases today, will rise to the challenge of climate change... just like we have recently risen to the challenge of Covid-19.

I am proud to be celebrating 30 years of involvement in the industrial gases sector in July of 2020. This industry continues to give me a sense of purpose every day. I hope that you also enjoy your work in the sector.

About the author

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