



Powering the Energy Future



L-R (clockwise): LNG Fueling Station France (compact 3 in 1); LH2 Storage Tank (w/ rapid liquid withdrawal); LNG fueled bus; FCEV Fuel Cell Electric Vehicle Fueling; Klaipėdos Nafta LNG receiving terminal in Lithuania



"Chart Industries has been producing hydrogen-related equipment for over 50 years, and we are continuing to discover its many applications as a safe, reliable and versatile fuel. We believe hydrogen will be a key part of the clean energy transition, and our products make it possible for hydrogen to be used in delivery trucks, forklifts, cars, power generation, and even aerospace."

*- Jillian Evanko, President, Chief Executive Officer and Director,
Chart Industries*

Thinking back 20 years ago, no one could have imagined the potential, impact and emerging application that H₂ and LNG would have in the future of clean energy.

Read some of the latest happenings at Chart Industries below:

Expanding Blue LNG Corridors: Europe & China



EUROPE

L-R(clockwise):GASUM in Helsingborg (Sweden); Shell station in Rotterdam (Netherlands); GASUM in Kuopio & Lappeenranta (Finland);LNG station in Bisek(Poland)



CHINA

L-R(clockwise): Yanggao fueling station; IMC ENN; LNG Dispenser; IMC Beijing; IMC Guangxi

As countries and companies pledge to reduce their greenhouse gases, China and the EU take the lead at expanding the number of LNG and LCNG fueling locations. At Chart Ferox, located in the Czech Republic, production has begun on LNG Station No. 100 with the latest one destined for Germany.

Chart China has produced and installed over 200 permanent LNG stations and IMC style stations (stations fully contained within Intermodal Shipping Containers) through manufacturing in the city of Changzhou.

It is also worth mentioning that in 2020, the LNG dispensers in Europe set a record breaking number of filling from a single dispenser in six months covering 18,000 fillings, 3 million kilograms of LNG and saving 30% of CO₂ emissions over diesel.

The LNG dispenser produced by Flow Instruments has hence proved that 100 fillings a day can be easily done. The total savings on CO₂ from the LNG stations produced by Chart Europe is more than 17 million kilograms of CO₂. At the last count, Chart China's total LNG dispensers in service was 1100+.

While compressed natural gas, batteries and hydrogen may have their place in the future of green transport fuels, LNG is becoming more readily available with many commenting that due to its familiar fueling cycle and on-board mileage capacity, which is similar to diesel, this decision of swapping is much easier.

And the top reason Europe, China and other countries are taking a double take on LNG powered vehicles is due to its safety record. LNG alone stands as the best safety record of any over-the-road fuel. A 50-YEAR HISTORY.

Innovation by Chart Industries: A New Level Cryo-Trailer



Automated Semi Trailers

Safety, ease of use and efficiency on a new level by Chart Industries. The best products from three areas have been combined to create a new innovation. This new generation of cryo tankers offers unique possibilities .

MultiControl from VCT Vogel guarantees easy operations and fast monitoring of the tanker. The system guides the driver through the loading and unloading process by monitoring all important parameters.

The connection to the Flowcom® 3000 measuring system ensures proper cooling of the pump and prevents the pump and valves from damage. It also gives the opportunity for fast data transmission via Bluetooth® for direct billing after the delivery.

Also, the road tanker with the best payload as a result of state-of-the art materials and an optimal construction from the outstanding 'GOFA quality' combines it all. The result is safety, reliability and handling on a new level. This new automated trailer is available for air gases, CO₂, LNG and more upon request.

For more information, please click [here](#).

Marine Fuel and Hydrogen – the Cleanest, Coolest Fuel



*Fraser Bennie, Global
Director, Marine LNG,
Chart Industries*



LH2 Storage

It took us to the moon and launches the satellites used daily for communications. It helps in our food chain through its use in fertilizer manufacture, and is commonly used in electronics and other industries. Its success as a fuel spans decades, and it is now set to grow on the waters. Liquid hydrogen is cold, real cold. And, like all cryogenic liquids, LH₂ is hydrogen in its most compact form.

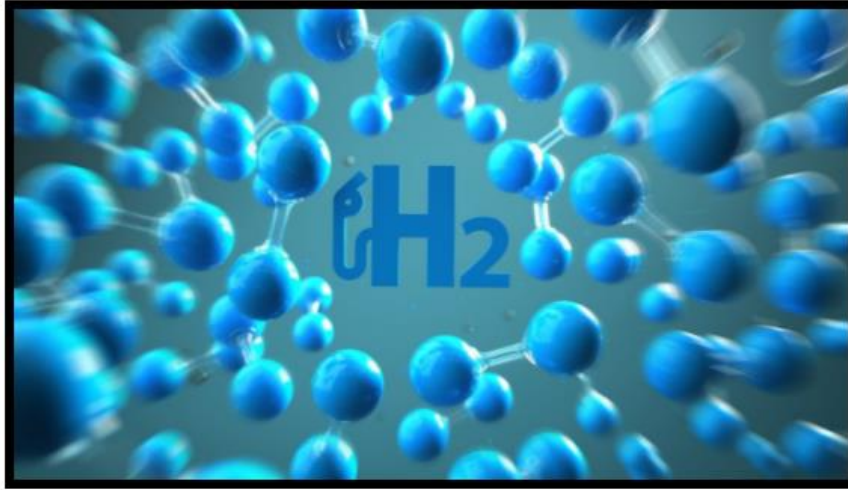
Chart's 50 years of experience in hydrogen includes liquefaction, transport, storage, containment and regasification. Each of these strategic pieces of a LH₂ marine fuel gas system is combined in our pioneering onboard fuel gas system designs.

The fuel supply/distribution chain for LH₂ propelled vessels has similarities to the expanding LNG for marine fuel. Not only can LH₂ be brought onboard safely, it can also be stored, transformed to gas, piped into main engines or fuel cells for power generation, propulsion or even for just the hotel load.

While similar in the approach to distribution, liquid hydrogen is quite different from LNG since it takes expertise to contain, transport, handle and re-vaporize this fuel. Our fuel containment expertise and high-performance insulation technology is well known throughout the aerospace industry, and we are proud of our exceptional safety record.

The shipping industry knows that cleaning up ship emissions requires clean fuels and Chart is on-board to help. We are already working with several marine companies to bring LH₂ fuel gas systems to the maritime sector. Not only do we design the equipment to be shop built and standardized, but we also challenge maritime institutions and societies on the best designs in safety, operability and efficiency. For more information, including our hydrogen solutions video, please [click here](#).

Advances in LNG technology: Paving the road for liquid hydrogen



As countries accelerate efforts to reduce greenhouse gas (GHG) emissions and increase energy independence, hydrogen is taking center stage in many of the roadmaps. With advancements in fuel cell stack technologies and continued cost reductions, hydrogen can be used as an energy carrier to fulfil several roles in the energy sector.

With its ability to store renewable power, produce electricity, and power light and heavy-duty vehicles with zero tailpipe emissions, hydrogen can be a global energy source at scale. The liquefaction of hydrogen produced from low-cost sources will allow for the storage and transportation of hydrogen energy all over the world, using a supply chain very similar to how the LNG supply chain is structured today. The technologies for liquefaction and the storage and transportation of LNG can be used as a basis for developing global liquid hydrogen supply chains.

In fact, Chart and others have been successfully producing many of these liquid hydrogen products for decades to support local markets for space and industrial applications.

It is the globalization of liquid hydrogen that will require large-scale transportation systems that are used with LNG, and that extensive LNG experience can be applied to, for example, liquid export and import terminals, bunkering systems, and railcars. In many ways LNG, and the systems and supply chains currently in place to support a global LNG market, can be a template for building a global liquid hydrogen energy market. In this article, the similarities and differences of LNG and liquid hydrogen and their effect on how these liquefied gases are stored, transported, and used for their energy content, are discussed.

To read more, please click [here](#).

Adjusting to a COVID compliant environment



LNG Fueling Station during FAT

Congratulations to our team at Chart Ferox who used RealWear HMT-1 and Microsoft Teams technology for the Factory Acceptance Testing (FAT) of an LNG fueling station. Throughout the nine day duration information and visuals were relayed from our Decin, Czech Republic facility to Shell's teams in Germany and Switzerland. Despite not being at site, remote broadcasting enabled Shell technicians to remain fully appraised of the progress in real time, participate in the various tests to ensure they were

completed to their complete satisfaction and liaise directly with the Chart team.

Join us at these Upcoming Events

H₂Tech Virtual Event (May 18-19)	GPA Europe (May 25-26)
World Hydrogen Leaders (May 26)	The Australian Hydrogen Conference (May 26-27)
LDC SE Gas Forum (June 7-9)	American Hydrogen Forum (June 9)

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