

Drive H₂
Voith Plug & Drive
H₂ Storage System



Discover the potential of green hydrogen – energy source of the future

For many years, hydrogen drive systems for vehicles remained nothing more than a niche concept. But in recent years, the hydrogen-based version of e-mobility has been increasingly attracting the attention of politicians and industry. This is because hydrogen has clear advantages over other energy sources in many commercial vehicle applications in the off-road and heavy-duty sectors, for example – both technologically and in terms of operating costs. Take a look at the big picture and discover the potential of green hydrogen.

As you can see in the big picture, with its cutting-edge technologies, Voith can contribute to the reliability and efficiency of the entire concept at almost every point in the value chain already today. In this context, our new Plug & Drive H₂ Storage System is simply the latest in a long series of innovations.

to begin in early 2025. And not a moment too soon, because sometime between 2025 and 2030, according to a recent study by the Hydrogen Council, the total cost of ownership of hydrogen-powered commercial vehicles will be cheaper than that of today's diesel systems or comparable battery electric drivelines in other systems.

Due to its modular layout, our new Plug & Drive H₂ Storage System can quickly and easily be adapted to individual requirements:

+ Commercial Vehicles

Hydrogen is the first choice for heavy-duty vehicles, construction site vehicles, and similar applications. Depending on its size, a hydrogen-driven truck can be back on the road in less than 10 minutes.

+ Rail

Long charging times are also a no-go for trains. Hydrogen can be refueled in a short amount of time.

+ Marine

Hydrogen is a viable solution for decarbonized coastal vessels.

“Green hydrogen can be used to store and transport large quantities of renewable energy. With our new Plug & Drive H₂ Storage System, we’re setting a new standard.”

Patrick Seidel, Product Owner H₂ Storage Systems at Voith

Actually, the concept of our system has already successfully passed through the initial development stages. Industrial production is scheduled

Our new Plug & Drive H₂ Storage System: Technical scope

Our Plug & Drive H₂ Storage System is a complete system: from tank nozzle to fuel cell inlet – all from one source, including our patented mounting system for force absorption of H₂ tanks. According to Voith's guiding principles for innovation projects, safety and quality prevail in every single fiber of our product solutions. Over the complete lifecycle, sustainability and circularity are ensured. And thanks to our modular basic components, optimized customer-specific solutions are always possible – as well as deep customer integration and co-development.

Important features and innovative advantages:

H₂ Core Module including:

- + Four 700-bar type IV pressure tanks with TowPreg winding technology
- + Complete H₂ periphery (valves, pressure regulator, receptacles, filters, pipes)
- + Tank Control Unit (TCU) including software, sensors (pressure, temperature, H₂), cables, "state of health" function
- + Mechanical structure including mounting system for tanks in rack/on chassis and rack to chassis

Tank dome shock absorbers

Optional:

large side tank (14.0 kg H₂) including On Tank Valve (OTV), end-plug and pipes

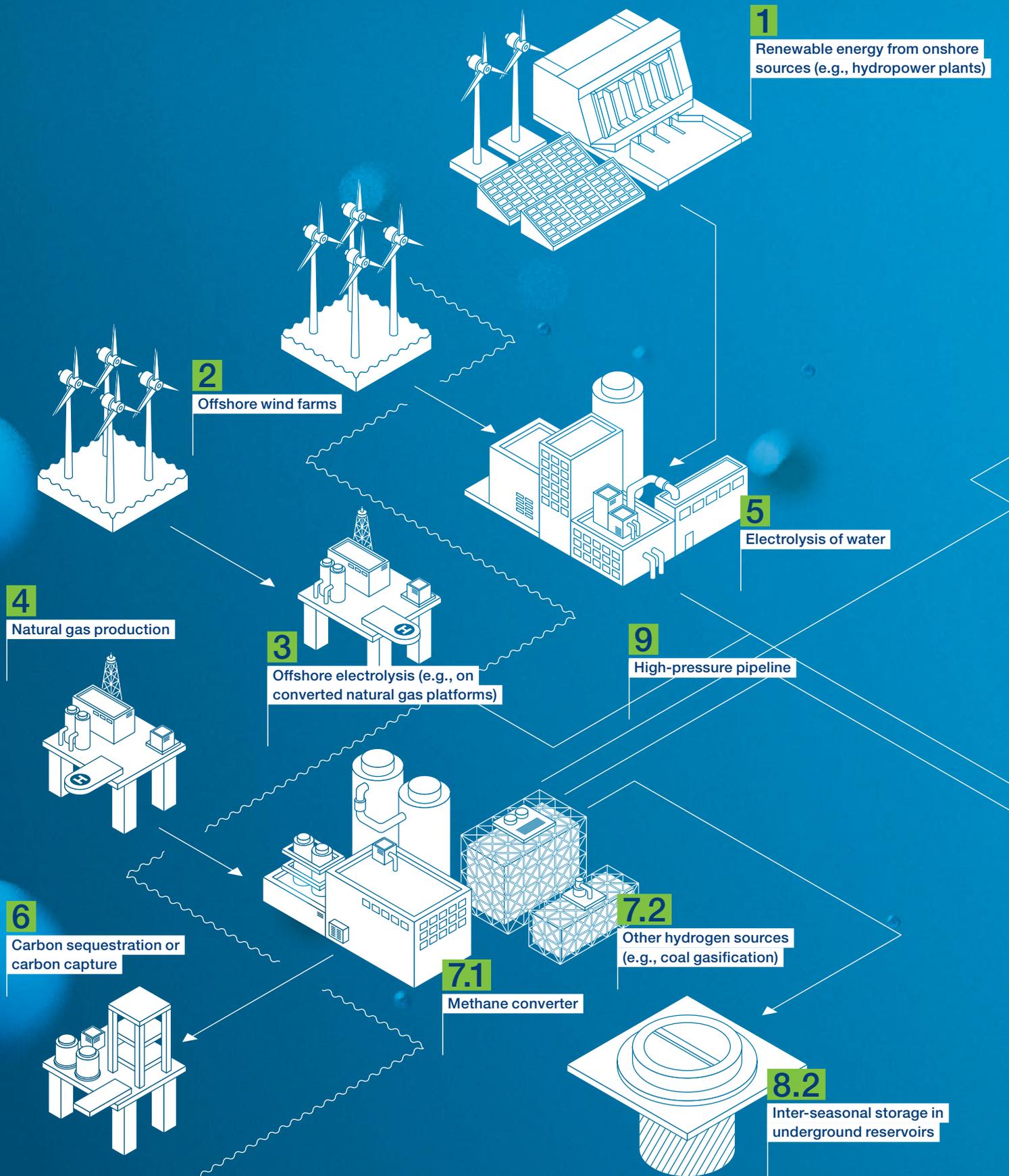


System lifetime of 1.6 Mio km/30,000 h

Voith patented tank force absorption system

Connection points for supply access (e.g., air, electricity)

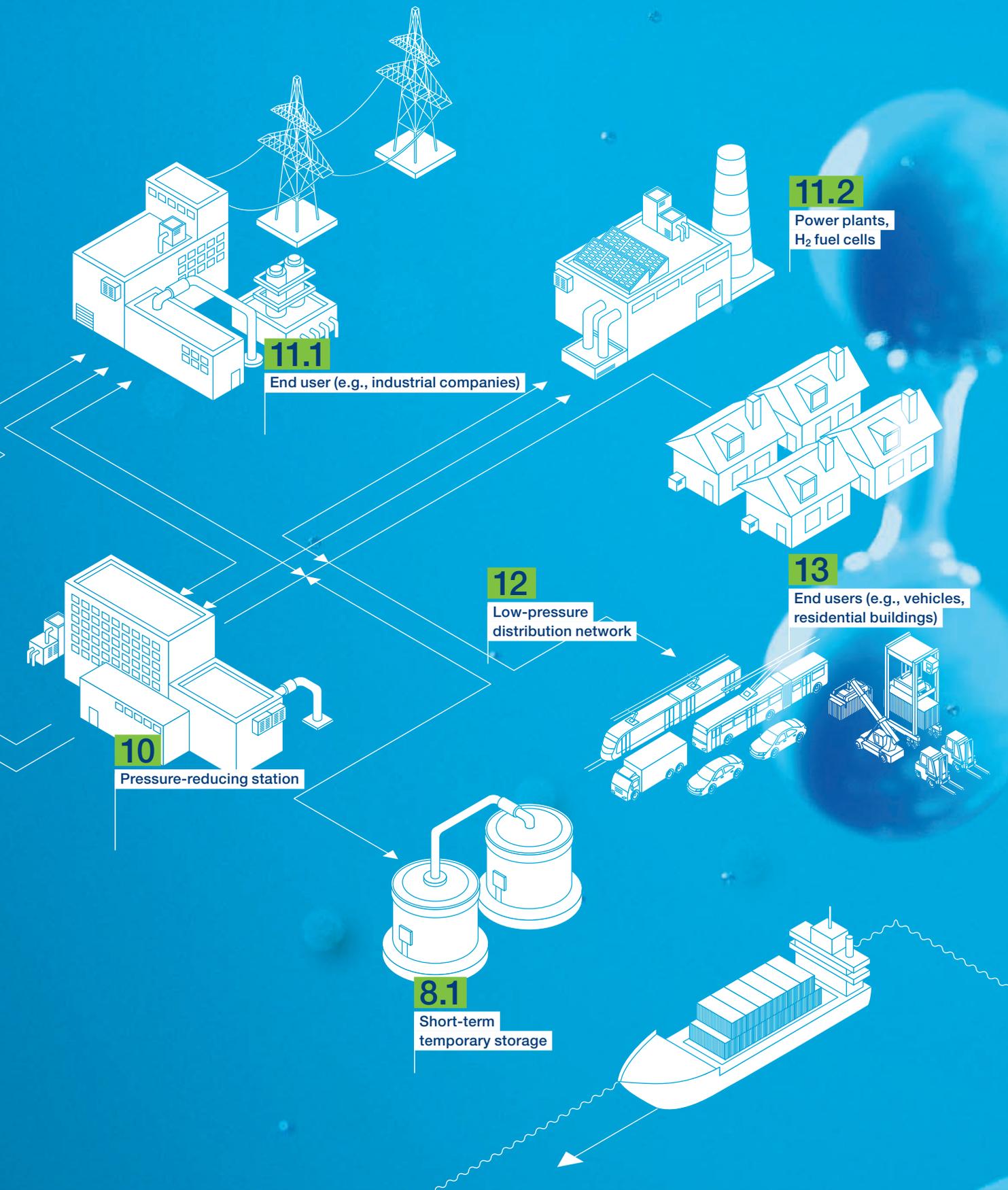
Optional: small side tank (5.7 kg H₂) including On Tank Valve (OTV), end-plug and pipes



The big picture: Green hydrogen from production to end user

Voith and its technologies play a key role in many aspects of green hydrogen production and its widespread distribution to end users.

First of all, hydrogen has a long journey before it ends up in a vehicle's fuel cell. Ideally, production is based on renewable energy sources such as hydropower or wind power (1, 2, 3, 5). Alternatively, natural gas (4) or coal (7.2) can be split into hydro-



gen and carbon (7.1). The carbon is subsequently processed further (6). The hydrogen can also be stored in large quantities until it is needed (8.1, 8.2). Distribution (9) to decentralized pressure-reducing stations (10) takes place via a high-pres-

sure pipeline network. From here, it is then distributed at low pressure (12) to end users (13). And if necessary, hydrogen can also be converted directly back into electricity in power plants (11).



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