

# HYGRO

hydrogen as primary energy carrier



## HYGRO's green hydrogen

Scalable extension for any service station

## Green hydrogen from HYGRO keeps you going



Global developments have accelerated the energy transition. Wind and sun now play an important role in renewable energy generation, and energy is extracted from these infinite sources in a variety of ways.

HYGRO has specialized in extracting green hydrogen from wind (or sun). By connecting an electrolyser to a wind turbine, HYGRO can produce green hydrogen more efficiently directly at the source. Besides the production of green hydrogen, HYGRO takes care of the storage and distribution of green hydrogen, which can be used directly to fuel vehicles at hydrogen refueling stations (HRS). Thanks to this integrated 'from wind to wheel' approach, HYGRO delivers affordable, green hydrogen to service station owners and fleet owners.



# Hydrogen will dominate road freight. Are you ready for 2026?

**Hydrogen is fast emerging as the most feasible replacement for diesel within the commercial transportation sector. Availability, flexibility and payload capacity are key drivers to profitability within commercial transportation operations, and hydrogen vehicles have a solid performance across all 3 metrics.**

While having no limitations in payload, hydrogen-powered trucks require a short refueling time of below 10 minutes, in contrast to comparable alternatives such as battery-electric powered trucks, which require a much longer charging time. For example, a Volvo FH electric has a charging time of 9.5 hours with AC (43 kW) and 2.5 hours with DC (250 kW). Refueling a similar hydrogen powered truck is 15 to 57 times faster.

Moreover, hydrogen-powered trucks can more easily achieve a relatively long driving range, which can be in excess of 700 km. In view of this, most of the major truck brands are now developing hydrogen-powered models.

Thanks to this scaling-up in manufacturing, hydrogen-powered trucks are set to become price-competitive compared to battery-electric and diesel powered trucks.

In many regions the electricity grid cannot keep up with the increasing electricity demand. This constrains the growth in fast charging stations for the transport sector. HYGRO provides a scalable solution using green hydrogen.

Green hydrogen provides an entirely new value proposition. Producing green hydrogen directly at the sustainable source and storing it under high pressure enables the utilization of hydrogen filling stations without the need for an on-site compressor.

As such, green hydrogen is a smart and inexpensive way to ensure a seamless match between supply and demand of energy.

Expressed in kilowatts of charging power, a hydrogen filling station is cheaper than the equivalent in charging stations.

2026 is already close! HYGRO is helping service station owners and fleet owners to supply green hydrogen to hydrogen powered vehicles. Now is the time to start if you want to be ready for 2026.



## HYGRO iBundle & satellite hydrogen refueling station

The HYGRO satellite hydrogen refueling station is designed to make it as easy as possible for service station owners to be able to offer green hydrogen to customers at a comparable price to diesel.

### Advantages:

- No compressor: high reliability, low investment cost and low maintenance cost
- Scalable with growing demand: in increments of about 60 kg/day
- Equivalent to 4 MW fast charger without grid congestion problems
- Affordable green hydrogen with dispensers under your own label
- Support from A to Z: HYGRO takes care of maintenance, inventory management and logistics
- The most cost-effective solution from a sustainable source to wheel

## Hydrogen fueling will accelerate in the coming years

Hydrogen will play an increasingly important role in the logistics sector in the coming years. This is not only a result of technological developments but it is also reinforced by government policy, which will ensure that a major turnaround will occur by 2026. Truck manufacturers in Europe have firm CO<sub>2</sub> reduction targets requiring them to offer zero-emission vehicles (30% by 2025 and 70% by 2030).

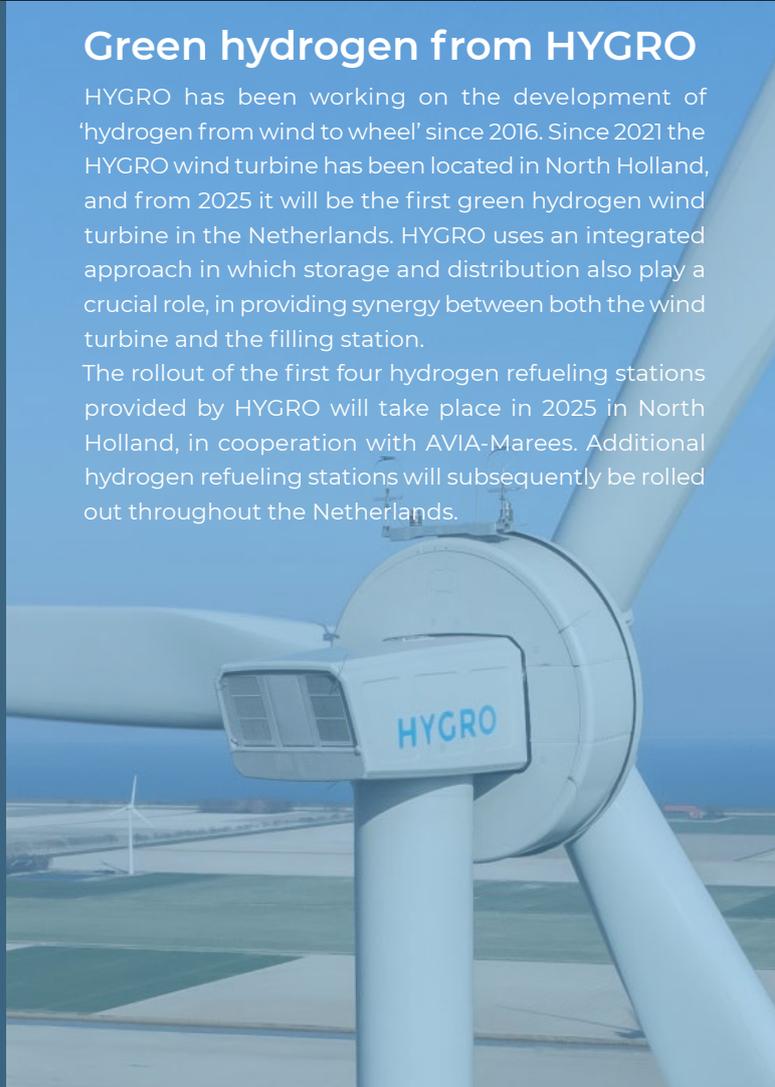
Additionally, from 2026 diesel will become more expensive in Europe due to an additional CO<sub>2</sub> tax. This CO<sub>2</sub> tax will be capped at 0.11 euro/litre and will remain in place until 2030. After that, the tax will follow the European market price for CO<sub>2</sub>, allowing it to double during this period. All around the world, similar incentive programs are being introduced to stimulate the transition to zero-emission transport for which hydrogen is perceived as an impeccable solution. Cities have made announcements that they will be closing their inner cities to emission vehicles from 2025 onwards.

**From 2026, the truck levy will become a reality in the Netherlands. Zero-emission trucks will receive a discount of up to 75%, which could amount to more than 10,000 euros per year. The proceeds of the levy will be used to stimulate the purchase of vehicles by 300 million euros per year.**

## Green hydrogen from HYGRO

HYGRO has been working on the development of 'hydrogen from wind to wheel' since 2016. Since 2021 the HYGRO wind turbine has been located in North Holland, and from 2025 it will be the first green hydrogen wind turbine in the Netherlands. HYGRO uses an integrated approach in which storage and distribution also play a crucial role, in providing synergy between both the wind turbine and the filling station.

The rollout of the first four hydrogen refueling stations provided by HYGRO will take place in 2025 in North Holland, in cooperation with AVIA-Marees. Additional hydrogen refueling stations will subsequently be rolled out throughout the Netherlands.





## HYGRO

HYGRO provides an integrated, scalable, competitive solution for green hydrogen production, storage and distribution in the developing market.

Our view is that synergy between wind and/or solar power, direct electrolysis and pipelines will double the yield of renewable energy, and at a lower cost than electricity.

We can achieve this by using hydrogen as a primary energy carrier throughout the value chain.

This allows us to deliver green hydrogen, at the right time, in the right place, in the right quantities and at the lowest possible cost. Read HYGRO's corporate story on our website [www.hy-gro.nl](http://www.hy-gro.nl).



## The iBundle: the central point in the hydrogen chain

The challenge in a sustainable energy system is the mismatch between supply and demand. Both renewable energy and fuel are subject to demand fluctuations, which necessitates costly storage and distribution infrastructure to ensure a seamless supply-chain network. Unlike the electricity grid which cannot store electricity, hydrogen infrastructure provides both the function of peak capacity and storage in one, at relatively low cost. The central hub in the value chain is

therefore the so-called iBundle deployed as:

- Hydrogen (energy) **storage**
- Hydrogen (energy) **distribution**
- Reliable and affordable **hydrogen refuel capacity without a compressor**

HYGRO's role in the market is to be the connecting link in the chain so that green hydrogen becomes as affordable as possible for end users such as transpor-

ters using hydrogen trucks. For a service station owner, this means affordable refueling capacity and flexibility.

Hence, we see storage, distribution and refueling capacity as the central hub in the hydrogen chain from "wind to wheel". The iBundle is specifically designed to offer this as cost-effectively as possible to service station owners. HYGRO will be happy to tell you more about how this works in practice.

## Signing up for cooperation

Are you interested in cooperation, or would you like to know more? To contact us scan this QR code:



HYGRO is happy to help you get started with green hydrogen.

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## A satellite station consists of:



### 1. Three different dispensing options

- A. Filling pressure 350 bar  
(max 7.2 and average 4 kg/min)
- B. Filling pressure 700 bar  
(max 3.6 and average 3 kg/min)
- C. Combination of 350 & 700 bar

### 2. Process control unit

(Not shown)

- Cooling and control

### 3. Docking area with docking bay

- One iBundle is placed per docking bay
- Docking bay and iBundle are automatically & securely connected
- Number of docking bays in docking area depends on desired filling station capacity (kg/day)
- Dimension of one docking bay: 1.5 x 1.5 meters

### 4. iBundle:

- Frame with 4 carbon fiber strong high-pressure vessels 1.2 x 1.2 x 2.7 meters
- Rated capacity 75 kg hydrogen (when supplying hydrogen aggregate)
- Effective capacity 60 kg hydrogen (when supplying hydrogen aggregate)
- Automatic and safe connection to docking bay

## Satellite station sizing\*

**The closer average demand and peak demand are to each other in practice, the more affordable hydrogen will become.** Assuming that you as a filling station owner do not want to sell “no” to your customers and want to guarantee them at least a 95% full tank, the filling station must be dimensioned accordingly:

- The number of (additional) docking bays and iBundles to be placed must target the maximum peak demand per day to deliver this guarantee.
- Peak demand is determined by the maximum demand per vehicle, times the expected number of vehicles per day.
- A truck with 50 kg tank capacity (700 km range) will refuel a maximum of 46 kg at a time, assuming that at least 50 km of reserve is still kept in the tank.
- The number of iBundles to be replaced per day depends on several things, but is among other things, a derivative of the average demand per day and the next day's peak demand to be guaranteed.
- A truck driving 100,000 km in 260 working days consumes an average of 28 kg/day.

### Filling speed:

Trucks	number	1	2	3	4	5	6	7	8
Average demand per day	kg/day	28	55	83	110	138	166	193	221
Max peak demand per day	kg/day	46	93	139	186	232	278	325	371
Satellite sizing peak demand	kg/day	60	120	180	240	240	300	360	420
Docking bays	number	2	2	3	4	4	5	6	7

\*1) Die exakte Größe und Performance wird sich situationsabhängig unterscheiden. So verändern sich die angegebenen Werte mit der Außentemperatur, dem Fahrzeugtyp und dem Füllstand des Tanks leicht. HYGRO berätet sie gerne für individuelle Maßanfertigungen.

