

Helen x Hydrogen Research Forum



HELEN



Helen in brief

Helen helps to make everyday life a little easier for over 560,000 customers in Finland.

In addition to electricity, heating and cooling, we offer solutions for regional and renewable energy and electric transport.

We are building a smarter, sustainable energy system that enables everyone to produce, use and save energy with respect for the environment.

We have set a target of making our energy production carbon neutral by 2030. Additionally, we plan to phase out combustion-based energy production by 2040.

Let's join forces and turn the opportunities of a new energy era into reality.

Helen in numbers

Net sales of the Helen
Group in 2023

1,826 mill.
€

Operating
profit

93 mill.
€

Electricity production

4,686 GWh

Heat production

6,673 GWh

Tax footprint

388 mill.
€

Employees

786

Carbon neutral
energy

55%

Reduction of direct CO₂
emissions

38%



Helen's strategy is to build green flexibility



Hydrogen business supports Helen's strategy

Green transition



The production of green hydrogen reduces emissions by 270 kgCO₂/MWh in comparison to its fossil counterpart¹.

3H2 – Helsinki Hydrogen Hub will reduce emissions by 3.7 ktCO₂ each year.

Flexibility



If needed, electrolyzers can be ramped up or down flexibly. Hydrogen production can thus be optimized against power markets which doesn't cause hydrogen supply disturbances during ramp downs if buffer storages, e.g. pipelines, exist.

Hydrogen production yields another source of waste heat that complements Helen's heating platform, further diversifying the portfolio.

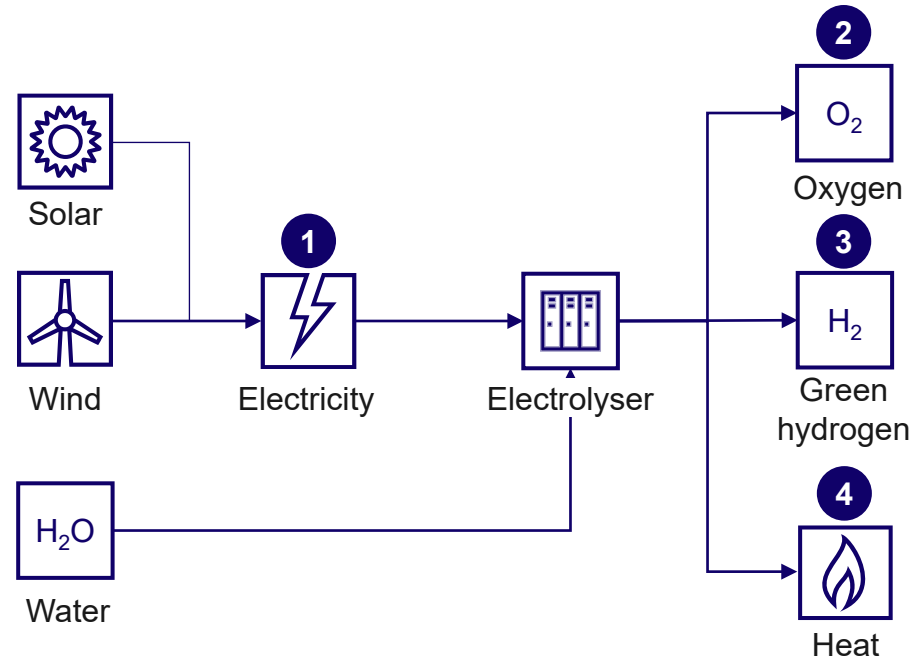
Profitability



Electrolyzers create a steady off-take for Helen's own electricity portfolio, hedging power generation investments against low price hours and increasing overall profitability.

Green hydrogen is in high demand due to EU regulations and can be sold at a significant margin.

Helen has multiple synergies between the hydrogen business and other businesses within its portfolio



Synergies with Helen's business areas

1 Renewable electricity

Helen has a substantial RES portfolio (Wind, solar, hydro +nuclear) and electricity trading capabilities.

2 Oxygen

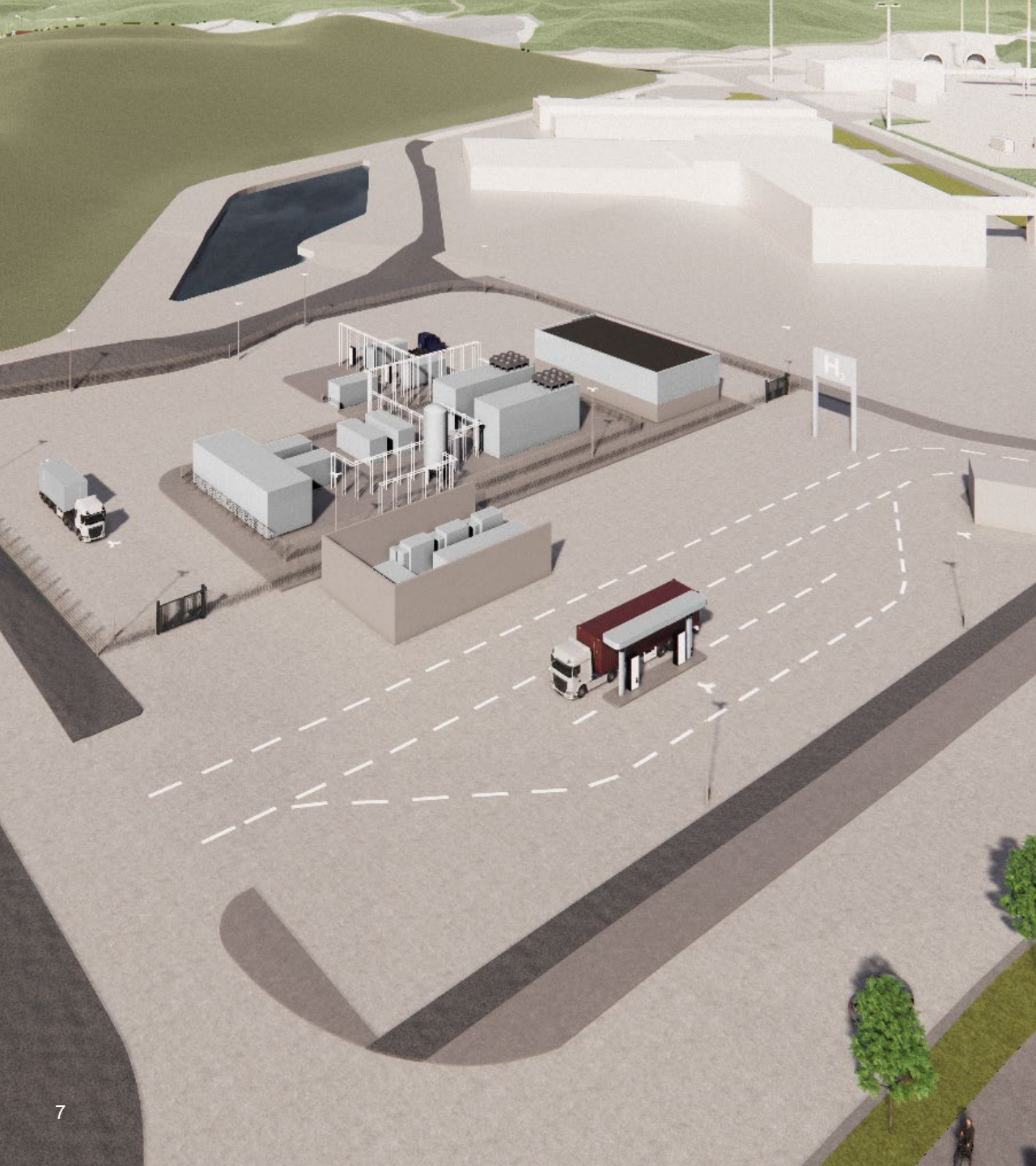
Helen has a biomass heat plant that could potentially utilize the oxygen sidestream from the hydrogen production.

3 Renewable Hydrogen

Hydrogen can be used as an energy carrier and an energy storage which is necessary for varying RES production.

4 Waste Heat

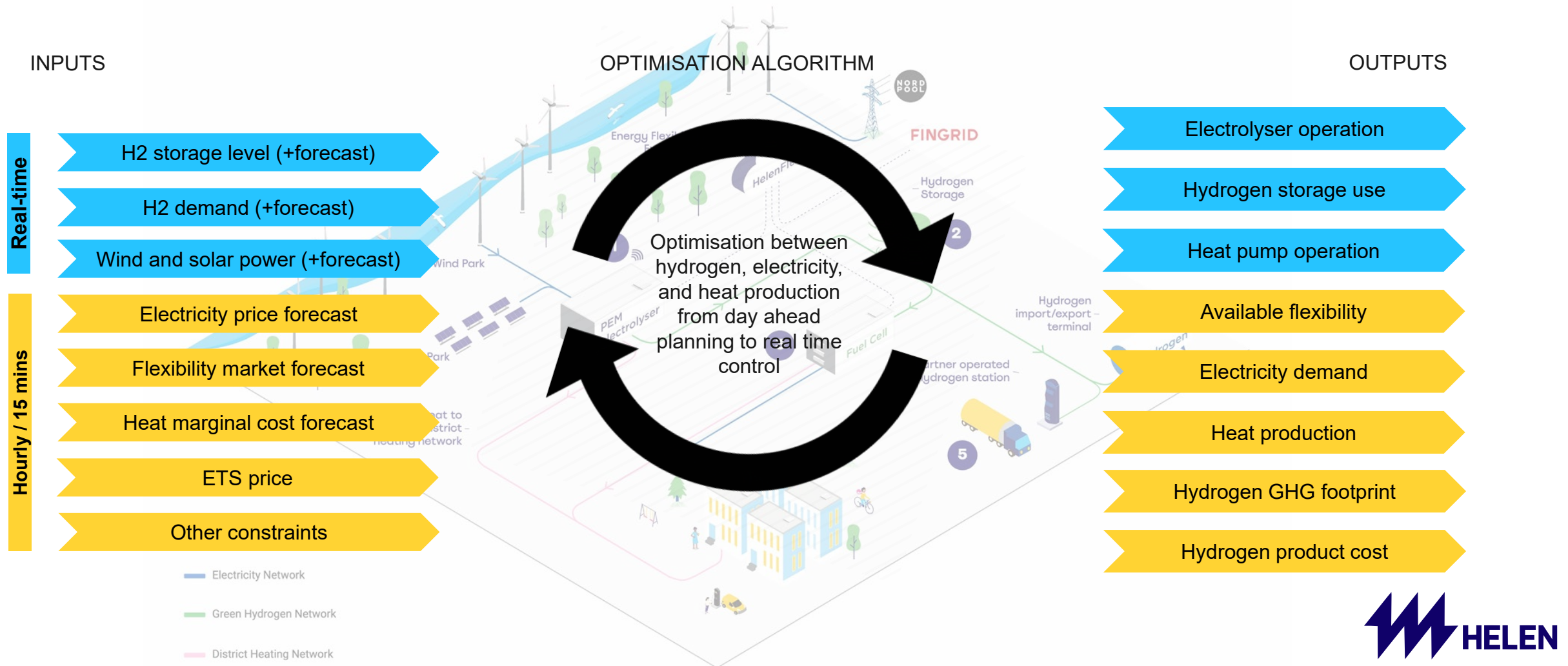
Helen has Finland's largest district heating network and waste heat from the hydrogen production can be utilized in Helen's heat platform.



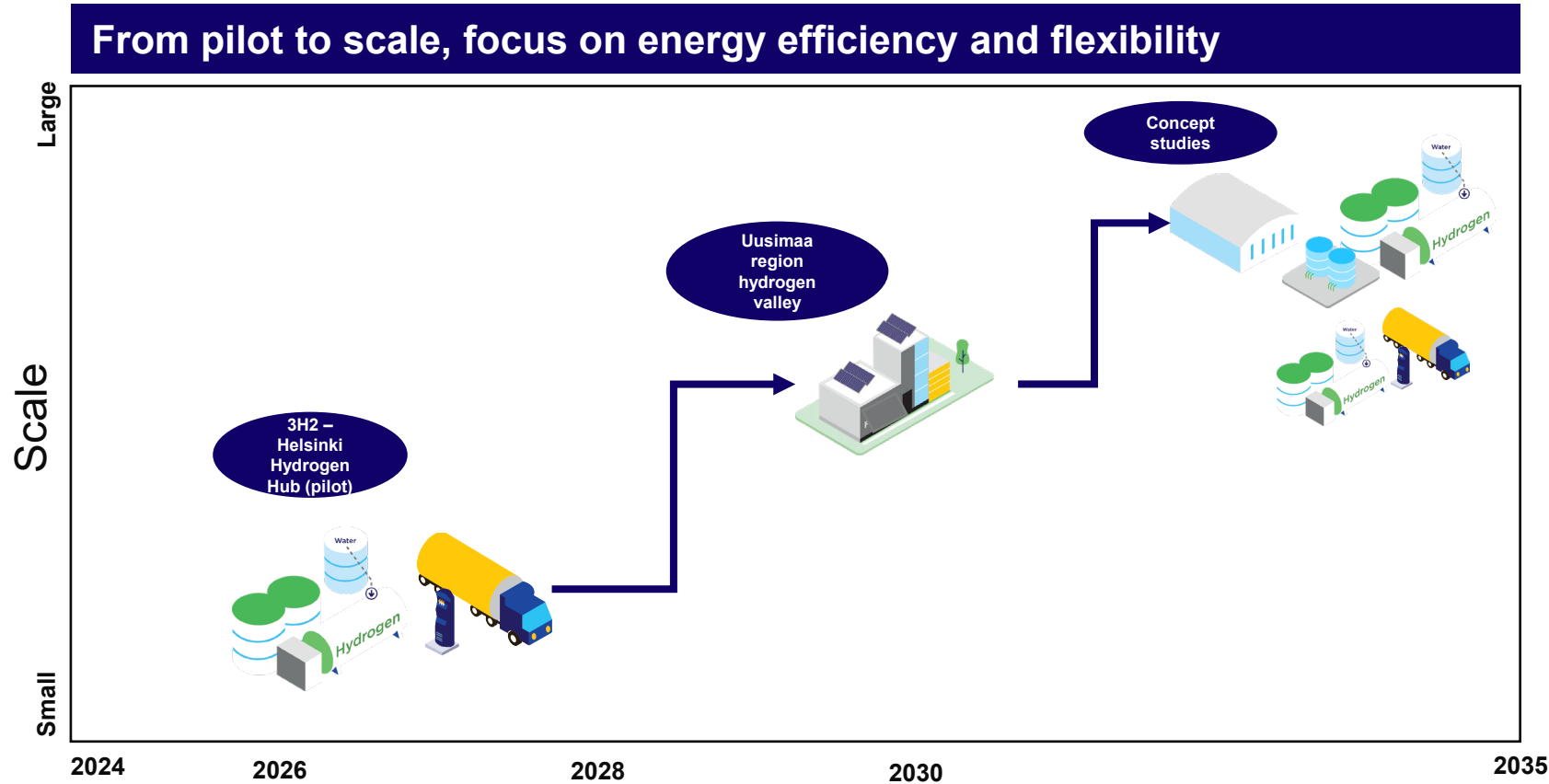
3H2 – Helsinki Hydrogen Hub

- Helen made an FID on the first hydrogen plant in March 2024
 - The start-up is planned in 2026.
- Unique concept integrating 4 sectors together
 - Hydrogen, electricity, transportation and heating
- Designed for maximum efficiency and flexibility
 - Only renewable energy is used for hydrogen production with the help of hydrogen storages
 - All the waste heat is utilized in Helen's district heating network
- Hydrogen will be mainly used for heavy duty traffic
 - Container loading terminal enables hydrogen to be transport to various customers, e.g. industry, ferries, etc.
- Technical specs: 3MW PEM electrolyser (grid connected), 350 bar hydrogen storages, heat pump, container filling stations, 300/700 bar refueling station (by Helen's partner)

Hydrogen production and use requires automatic and real-time optimization and operation



Helen is building hydrogen business leveraging its existing capabilities and synergies



3H2 – Helsinki Hydrogen Hub

- First commercial scale hydrogen pilot project.
- Targeting to solve the chicken and egg problem in hydrogen mobility sector.
- Targeted startup in 2026.

Uusimaa region hydrogen valley

- Helen, Neste, Gasgrid Finland, and Vantaa Energy are collaborating on the development of an industrial hydrogen valley in Uusimaa region.
- The valley combines infrastructure, storage, and transmission of renewable hydrogen, serving both producers and consumers of hydrogen.
- Helen is planning large-scale hydrogen production at Helen's Vuosaari power plant area.

Concept studies

- Helen is also studying together with partners
 - Biogenic carbon capture, utilization and storage (CCUS)
 - Large-scale H₂/PtX
 - Oxy-fuel combustion
 - Small Modular Reactors (SMR)



Do you want to hear more about Helen?

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