
OULUN
ENERGIA
POHJOISTA VOIMAA

Electrifying District Heat

Hydrogen Insight
14.2.2024 Oulu + takeaways

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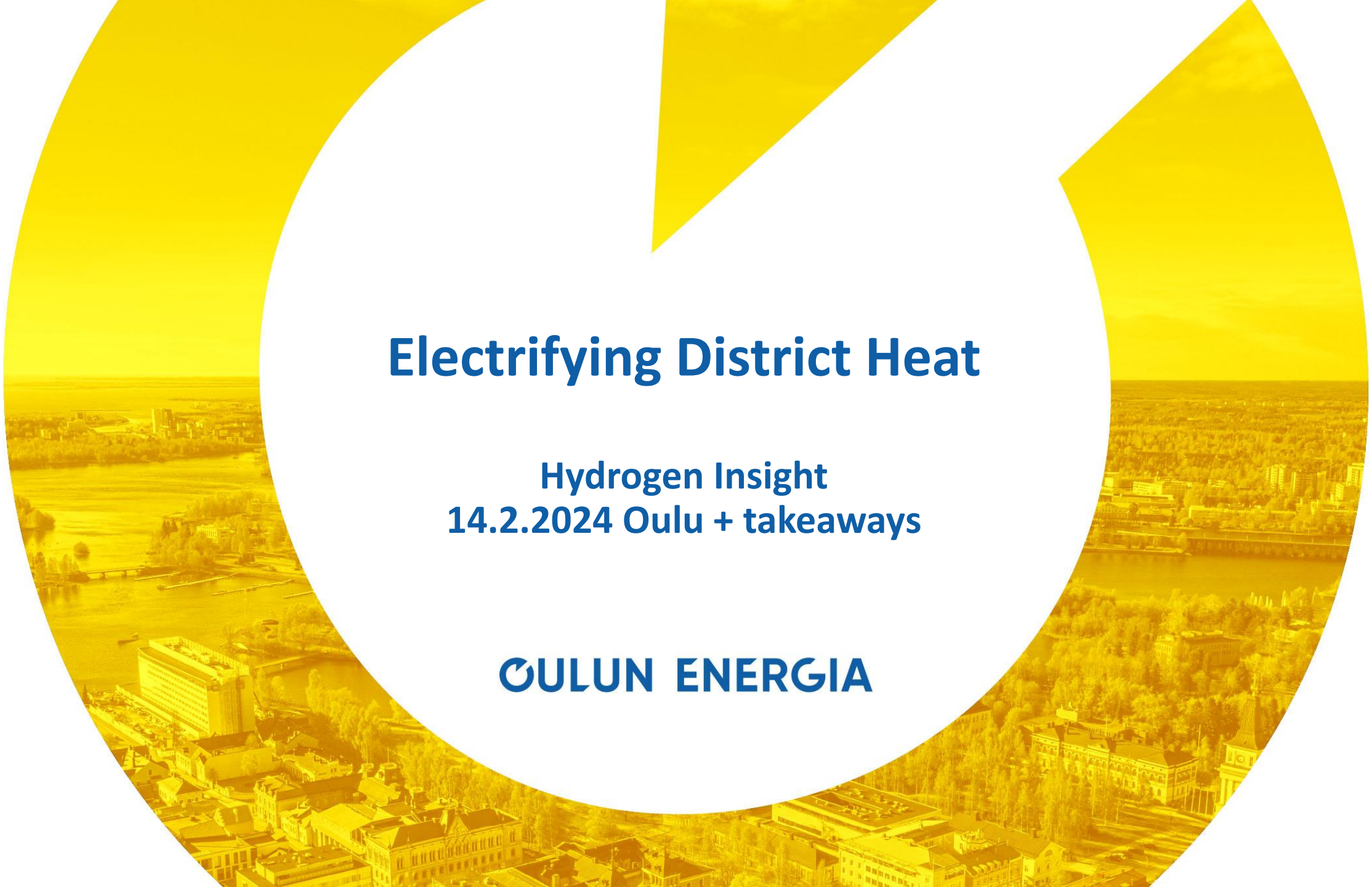

Our background

The first streetlights were lit on 8 December 1889

In the past decades, we have laid a solid foundation for energy production and for heat and electricity to have a safe journey to the people.

In the 2020s, the energy transition challenges us in a new way

We are heavily investing and will continue to invest in the circular economy and in new energy solutions.

100% CARBON-NEUTRAL 2030

Our most significant investments and development activities

- Merikoski power plant 1948
- District heating 1969
- Since 1977, Toppila Power Station produces heat and electricity from local energy
- Since 2012, Laanila ecopower plant processes energy from waste
- Laanila biopower plant 2020
- Waste sorting plant to Rusko 2020
- Carbon-neutral district heating
- A national pioneer in the circular economy 2022
- Syklo
- New investments in wind and solar power, etc.

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Oulun Energia in brief

Oulun Energia Group

Turnover	€268.2M
Operating result	€39.4M

Customers

Electricity distribution	116,843
District heating	10,903

Key figures 2022

Employees

249

Areas of business

ENERGY PRODUCTION

ENERGY SERVICES

CIRCULAR ECONOMY

Syklo Oy

ELECTRICITY NETWORK SERVICES

Oulun Energia Sähköverkko Oy

Affiliated companies

HYDROELECTRIC POWER

Voimapato Oy 40%
Kolsin Voima Oy 22.5%

WIND POWER

Pasaati Holding Oy 25.2 %

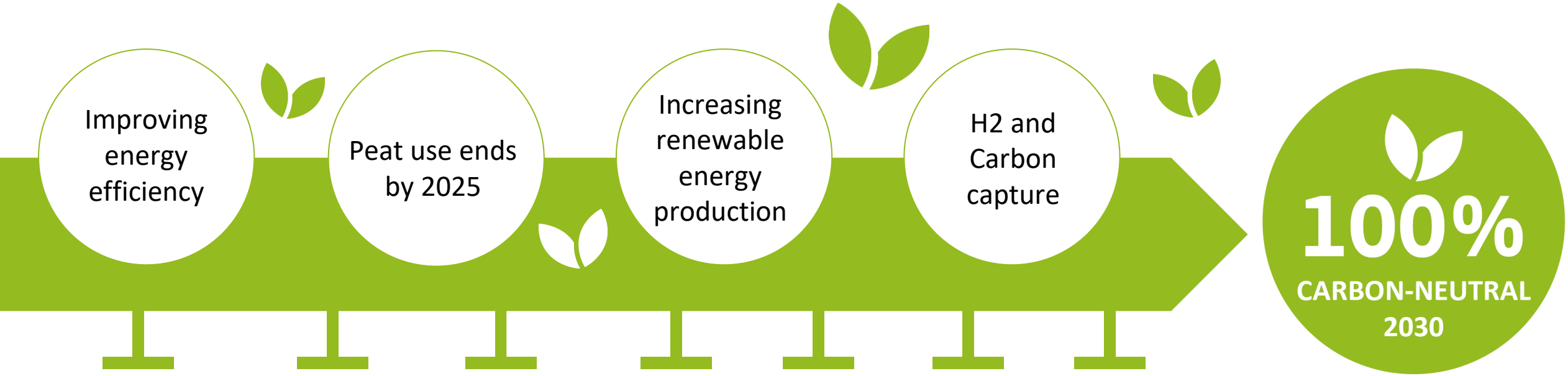
ELECTRICITY SALES

Oomi Palvelut Oy 23.9 %

Strategic priorities

- Customer-centric
- Boldly embraces the future
- A responsible pioneer
- Finland's most energetic workplace

Our visionary path to carbon neutrality and beyond



Together with our partners, we are building smart energy-producing residential and property blocks

In district heating network, we utilize excess/waste heat and increase demand response capacity

Increasing the use of renewable bioenergy

2021

Share of renewable bioenergy as fuel 60%

Optimized, minimized use and replacing fossil oil with ecofriendly as a fuel in our reserve power plants

2023

Laanila's first 40 MW electric boiler

Increasing wind power investments

2025

25% share of Finland's largest windfarm

Excess heat utilization from industry more than 4% equivalent to annual sales

Increasing solar power investments

2026

Solar power 100 GWh per annum

H2 production possibility with CCU and methanation

2028 >

Carbon capture 100,000 t per annum

Adding hydrogen and the production of synthetic fuels to production

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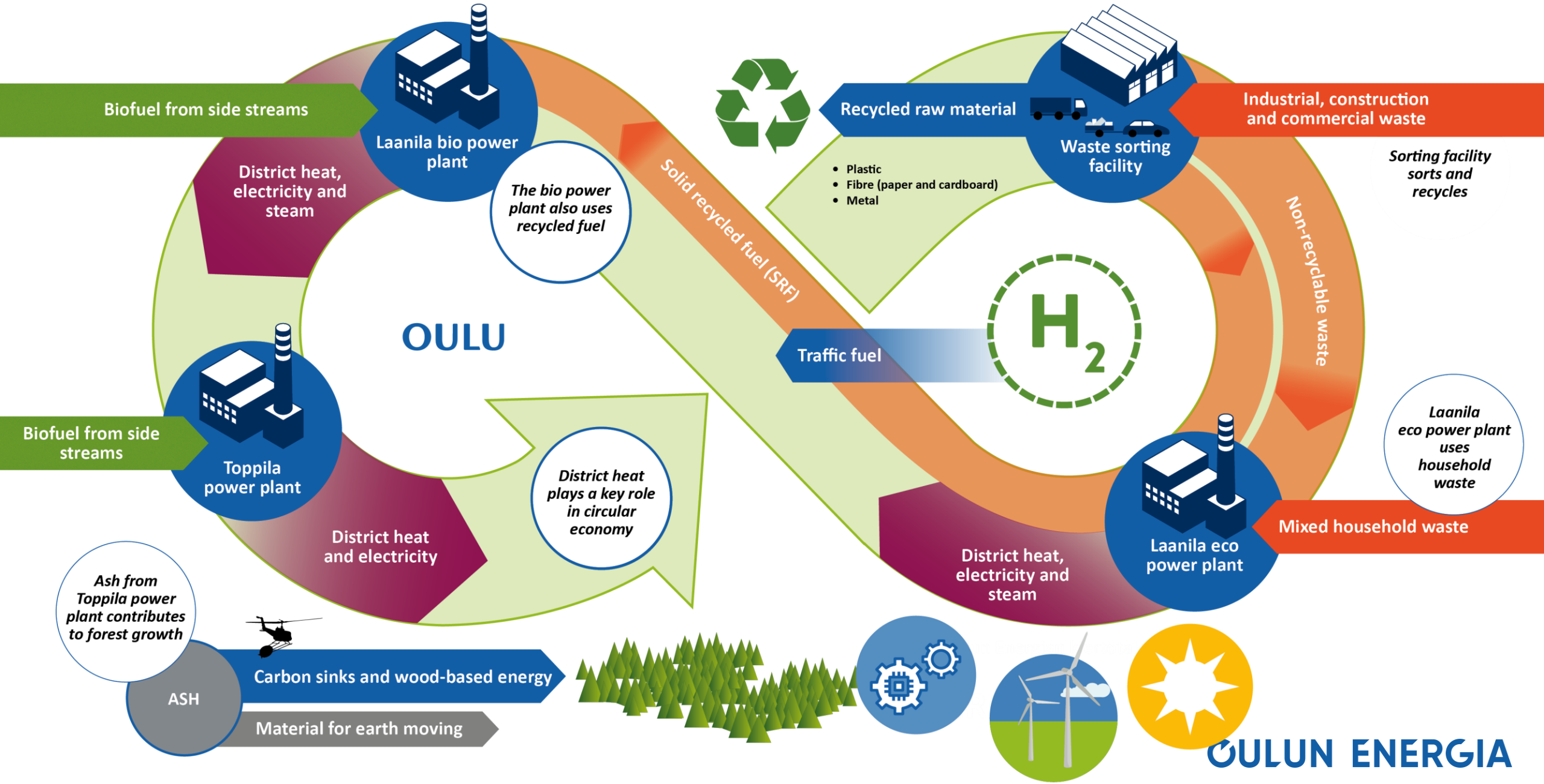
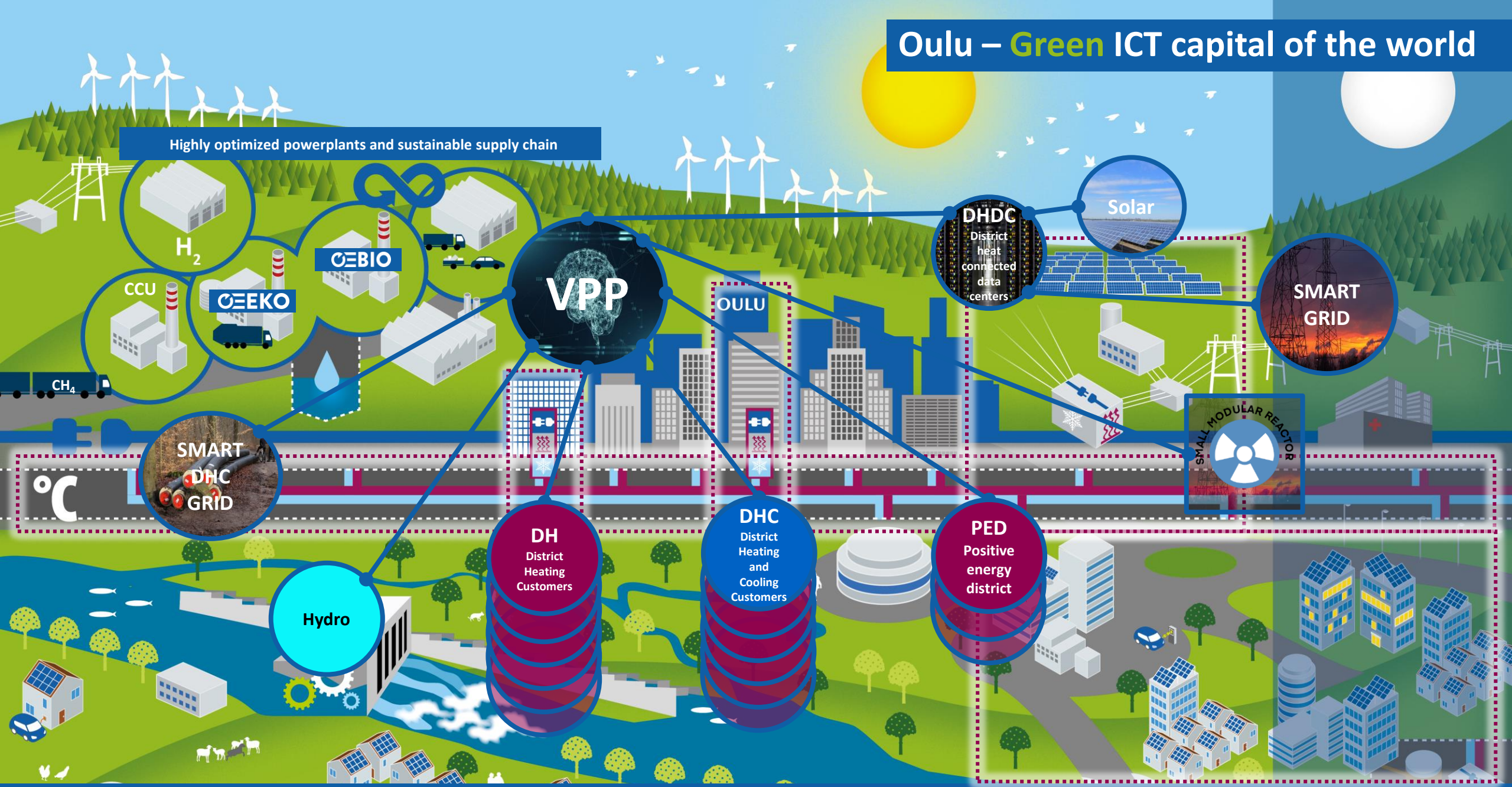
Energy ecosystem owned by the citizens of Oulu



Oulu – Green ICT capital of the world



Smart district energy ecosystem

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Development of the energy system - Hydrogen perspective

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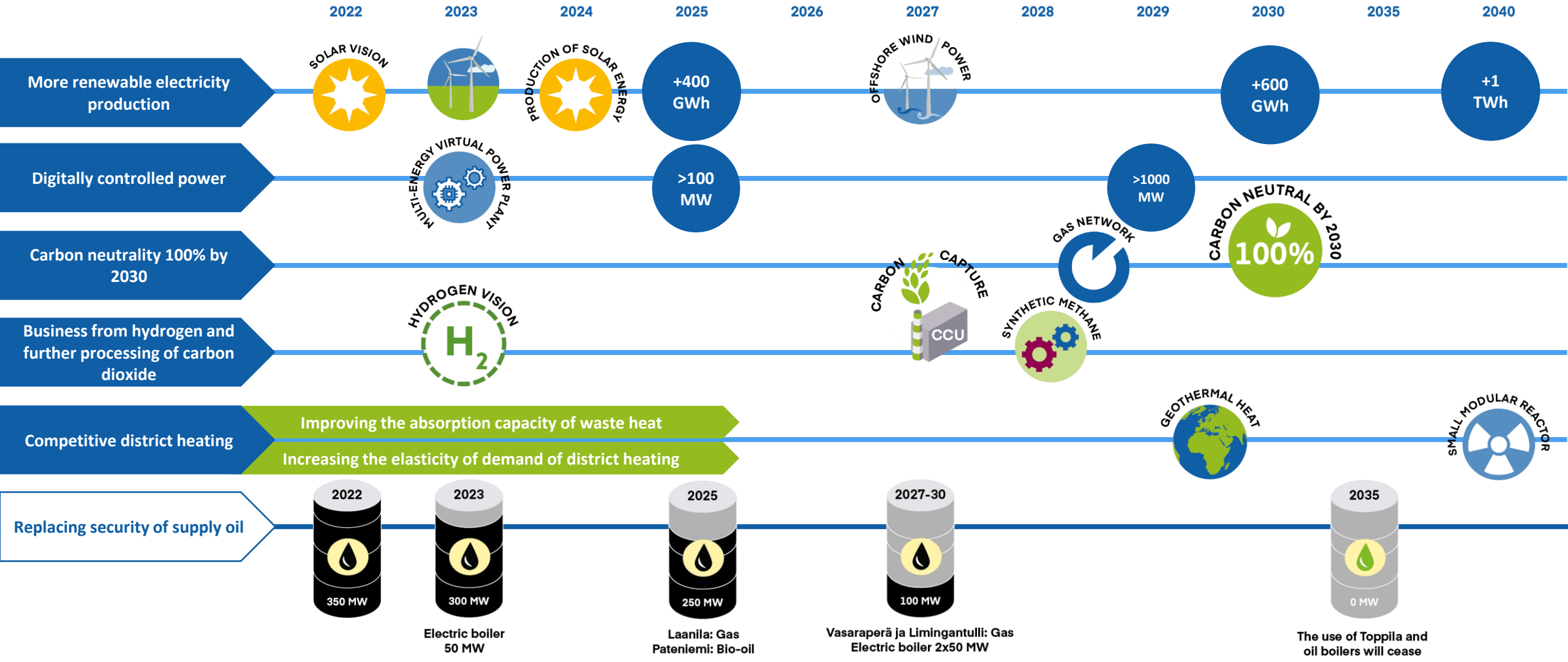
Development of the energy system



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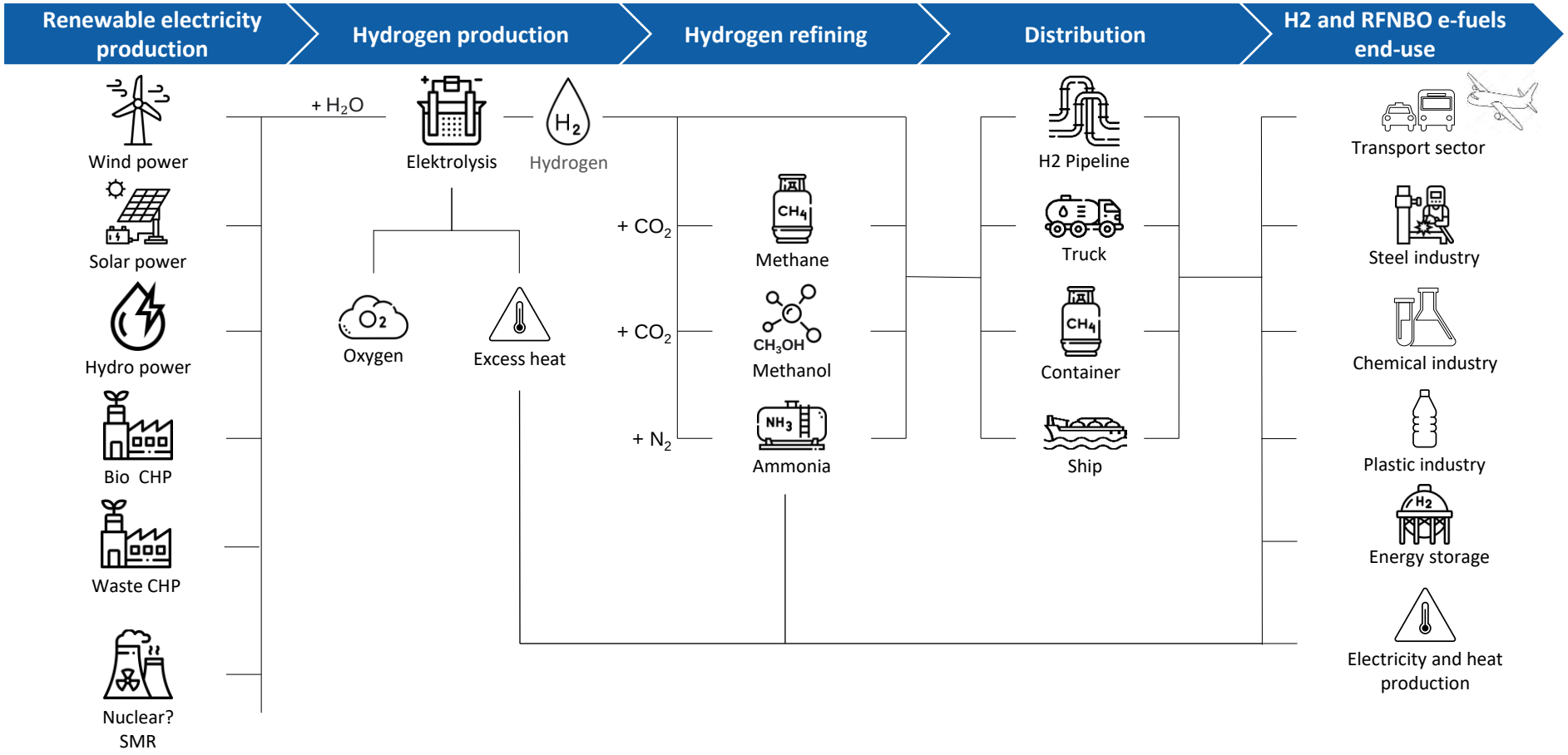
Global business potential - H2 Economy roles to be chosen



Factbox

For Oulu Energy, the most essential opportunities in the hydrogen economy are related to applications in transportation, industry, electricity and heat production, as well as energy storage.

Hydrogen can be utilized as pure hydrogen or further processed into synthetic methane, methanol, and ammonia.

As by-products of hydrogen production, clean oxygen and waste heat are generated, which can be utilized both as industrial raw materials and in heat production. Hydrogen and its derivatives can be distributed in bottled form, through pipelines, or via tank trucks and ships.

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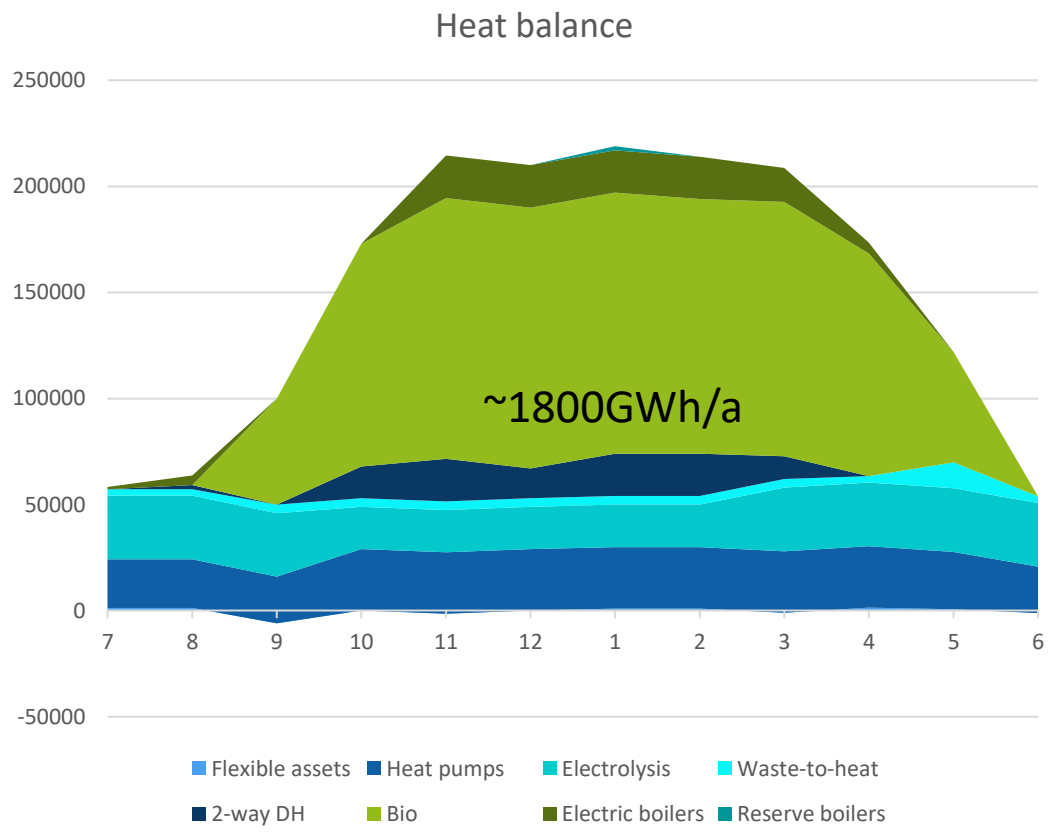
Energy production portfolio 2030 vision

- Renewable electricity production +1TWh (wind-solar)
- Hydrogen process heat recovery ~400GWh/a
  - Electric use addition ~0,5TWh/a (H_2)
- Datacenter heat recovery > 100GWh/a
- Process industry heat recovery > 200GWh/a
- Direct electrifying of district heat > 100MW (electric boilers)
- Control capability of all assets > 1000MW
  - Flexibility of electrical use > 300MW
    - Stabilizing networks and volatile electricity markets
  - Demand response capacity >20MW in heat
  - CHP production role will change



* one of many possibilities illustrated vision

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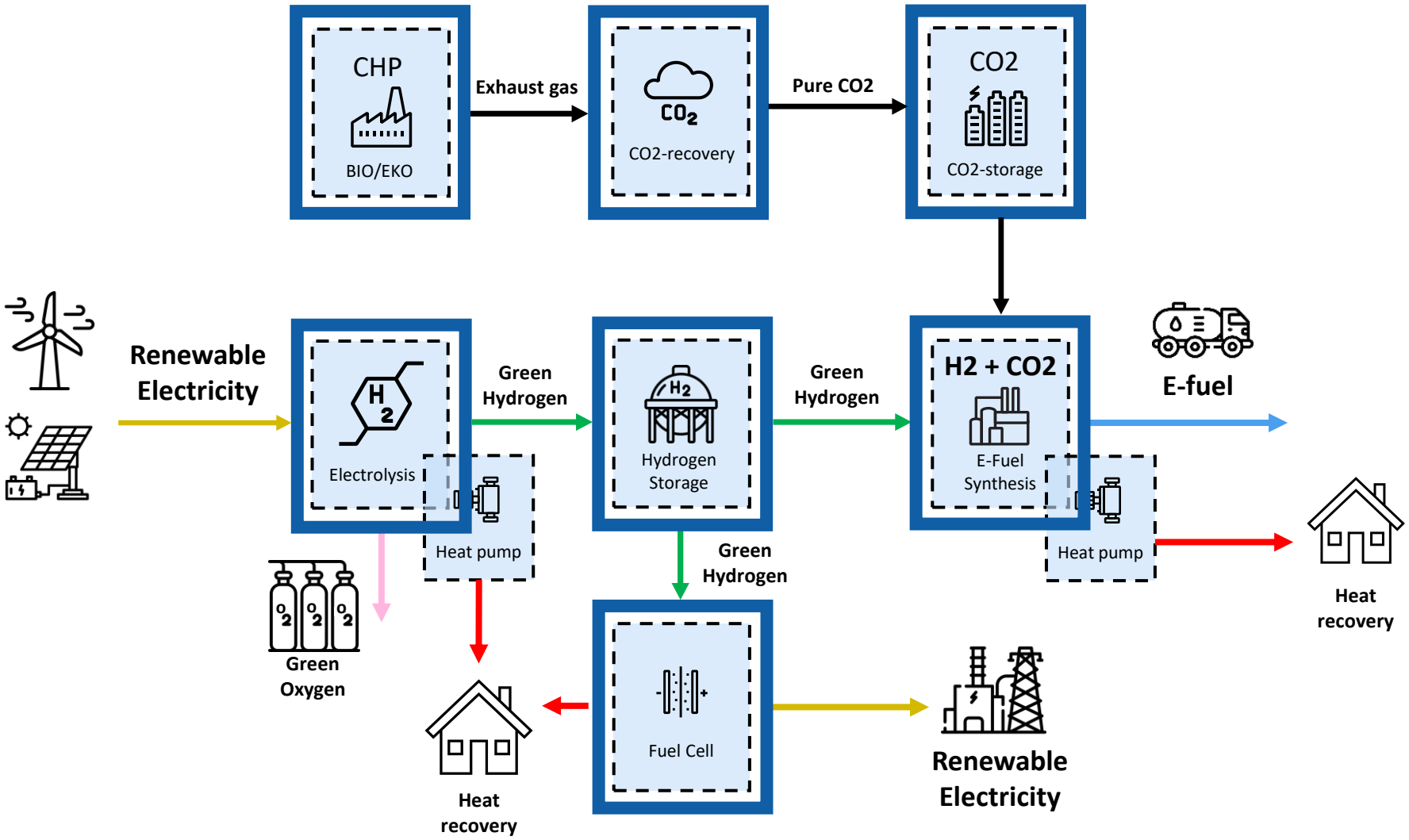
Green Hydrogen Project – Laanila



Factbox

- Oulun Energia operates OE-BIO CHP-powerplant producing biogenic CO2 and serving chemical industry site Laanila (steam, heat, electricity)
- Oulun Energia operates OE-EKO CHP-powerplant processing waste-to-energy, non-biogenic CO2. Serving chemical industry site Laanila (steam, heat, electricity)
- Oulun Energia is searching for new business opportunities e.g. from hydrogen and circular economy
- Hydrogen project preparations already started

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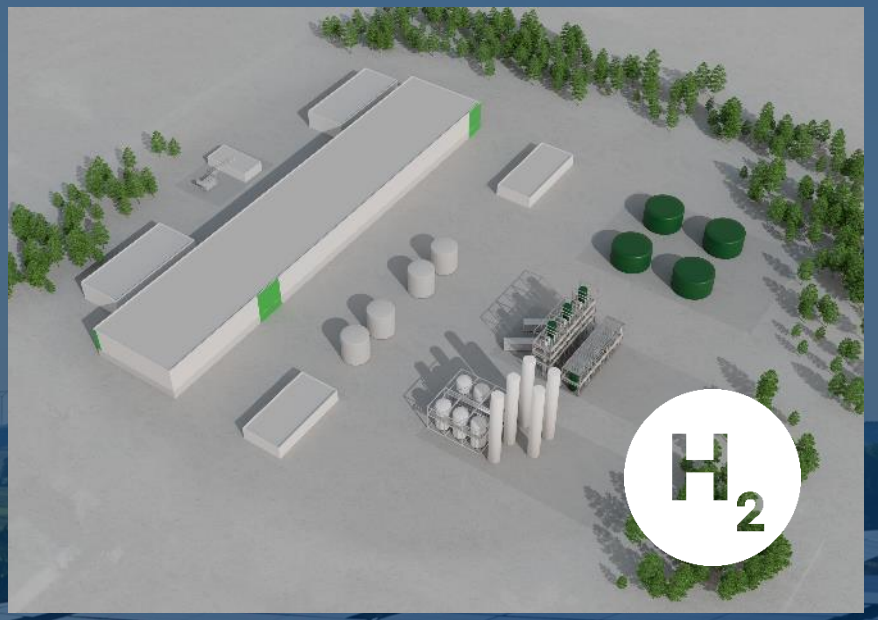
Diversity in energy production portfolio develops rapidly towards cleaner future

- Better place for generations to come
- District heating as an enabler / catalyst
- H2 potentials



Hydrogen plant
100 MW

Final product
could be methane or
methanol

Approx.
200–400 GWh
of heat energy per year

Ready by
2028
at the earliest

Kiitos!

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