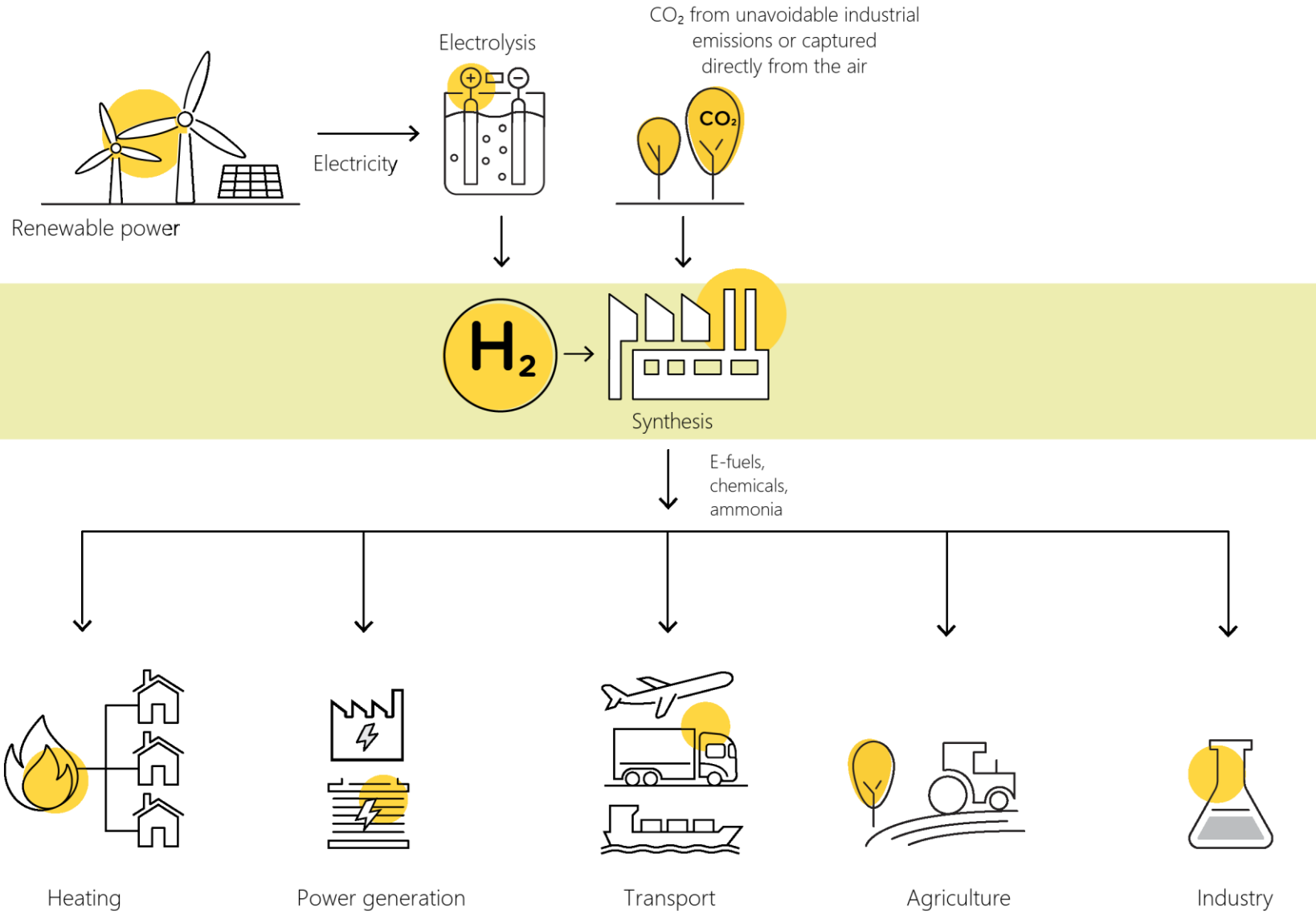
FROM PILOT TO PLANT

Jüri-Mikk Udam, Head of H2 and PtX development, Utilitas

Tallinn City Archives. The airship Graf Zeppelin over Tallinn, 24 September 1930

WHAT ARE E-FUELS?

- Hydrogen made from electricity, and fuels made from that hydrogen (e.g. methanol, methane, SAF)
- **Example plants (built or under construction):**
  - NEOM, SAU: 2,200 MW (2027)
  - AM Green, IND: 1,300 MW (2027)
  - Goldwind, CHN: 1,200 MW (2027)
  - Boden, SWE: 700 MW (2026)
  - Emden, GER: 320 MW (2027)
  - ***Audru, EST: 300 MW***
  - Xinjiang, CHN: 260 MW (2023)
  - Shell, NED: 200 MW (2026)
  - Kassø, DNK: 50 MW (2025)
  - Harjavalta, FIN: 20 MW (2025)
  - ***Väo, EST: 1 MW (2025)***



WHERE ARE E-FUELS USED?

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Shipping

- E-methanol as marine fuel (FuelEU Maritime)

Aviation

- E-SAF, mandatory blending from 2030 (ReFuelEU Aviation)

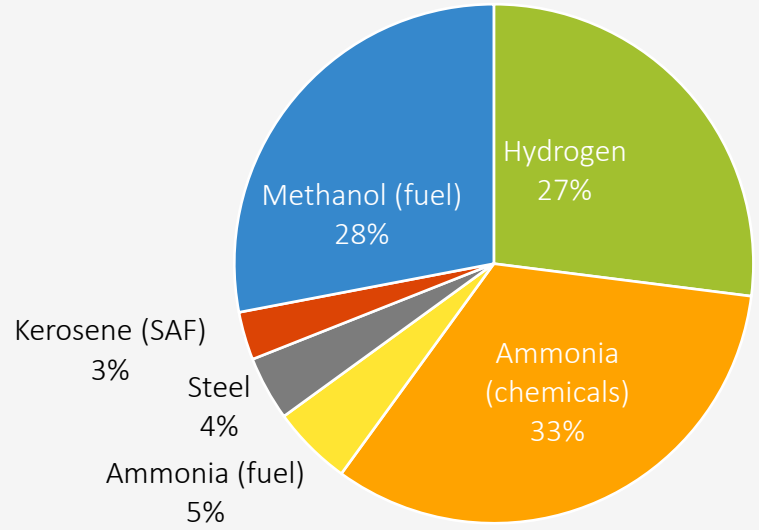
Industry

- Refining, steel, ammonia

Examples of buyers

- Maersk (MeOH)
- Novo Nordisk (MeOH)
- LEGO (MeOH)
- Danisco Sweeteners (H_2)
- Swiss, Norwegian and other airlines (SAF)
- NEO magnet plant, Narva (H_2)

Low-emission hydrogen offtake agreements by end product, 2021–2025

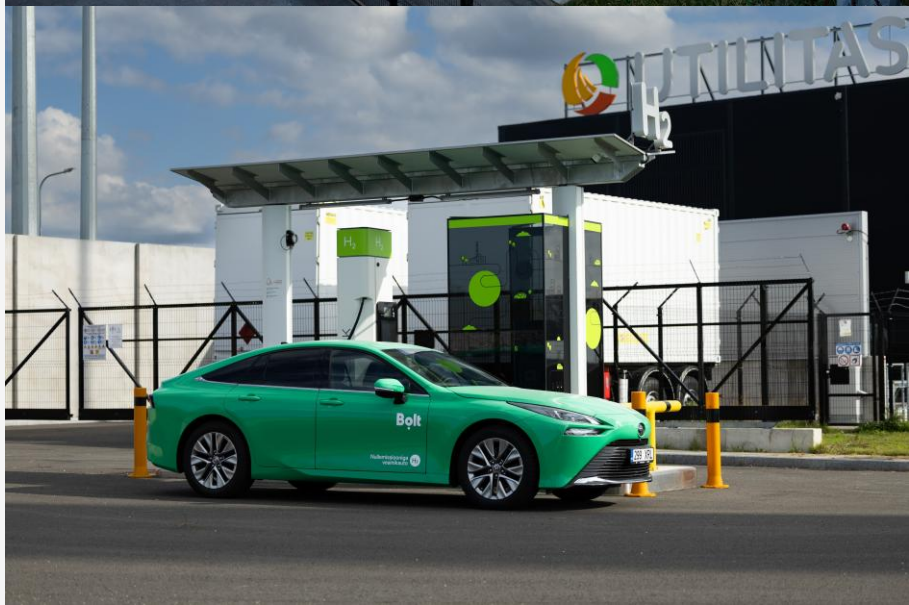


IEA Global Hydrogen Review 2025, Figure 2.2 "Offtake agreements signed for low-emissions hydrogen and hydrogen-based products, 2021-2025"

UTILITAS

GREEN HYDROGEN PILOT IN VÄO

- H_2 production: 1 MW electrolyser, up to 110,000 kg per year
- 2 public H_2 filling stations in Tallinn (Väo and Peterburi tee), helping meet EU targets for alternative fuels infrastructure
- 30 fuel cell Toyota Mirai cars in Tallinn
- Project partners:
  - Utilitas: H_2 production, use of waste heat
  - Stargate Hydrogen: electrolyser technology
  - Alexela: filling station operator
  - UG Investments: owner of the hydrogen cars
  - Bolt: ride-hailing partner
- Project start: January 2022
- Bolt cars on the road since September 2025



E-FUELS FACILITY IN PÄRNU, ESTONIA

- **Main parameters:**
  - Electrolyser capacity: up to 300 MW
  - Electricity demand: 1.6 TWh/year
  - Hydrogen production: 30 kt/year (intermediate product)
  - Demineralised water demand: 60 t/h
  - Biogenic CO_2 demand: 220 kt/year
  - Final products: e-methanol and e-SAF
- **Current status:**
  - Feasibility study completed
  - Market outreach under way
  - Spatial plan initiated in May 2026
  - Technical EIA study ongoing
  - Next: product choice, CO_2 sourcing and talks with European buyers

2026
Spatial plan initiated

2028
Permitting completed

2029-2031
Design and construction

Co-financed by the Connecting Europe Facility of the European Union

WHAT HAS TO BE SOLVED TO SCALE UP

UTILITAS

- Technology
  - Electrolysers: lower cost per MW, longer stack life, flexible operation with wind power
  - CO_2: affordable capture from biogenic sources and transport to the plant
  - Synthesis: e-SAF routes (Fischer-Tropsch, methanol-to-jet) proven at scale
- Markets and rules
  - Cheap renewable power hours and a grid connection
  - Clear RFNBO certification (EU rules for green fuels)
  - Long-term purchase contracts that banks accept

SEEING IS BELIEVING