

Latest developments on hydrogen at the distribution level

10th Session of the Group of Experts on Gas
23. March 2023

Eva Hennig, Thüga AG, Head of Brüssels Office

22 COUNTRIES, 7 ASSOCIATED COUNTRIES, 100 DSO, 8 ASSOCIATIONS, 1 TECHNOLOGY PROVIDER JOINED FORCES TO SHARE KNOWLEDGE



Local gas networks across Europe work hard to get **Ready for Hydrogen**. In 13 countries investigations are well under way and the **material** of 1 151 000 km of pipelines (96 %) are ready for conversion to pure hydrogen. The readiness of **components** (connections, valves, metering equipment, compressors, etc.) is under evaluation. In parallel the discussion with customers – especially **industry and CHP** – and **potential local H2 producers** start.

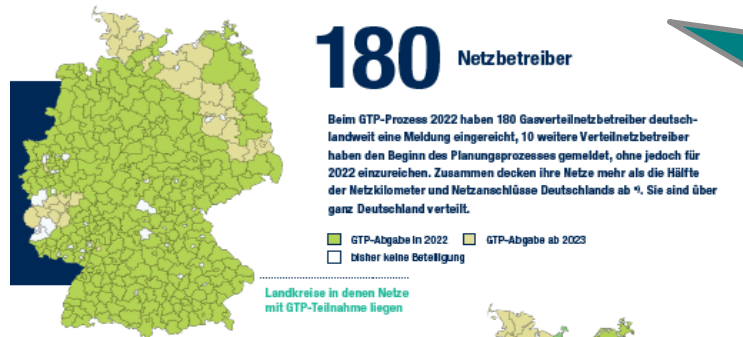
Societal drive to decarbonise: European and national net zero targets



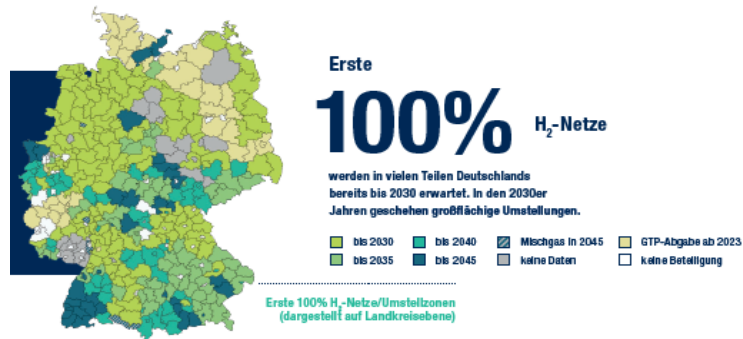
Enablers that help local gas distribution networks to make the transition



EXAMPLE GERMANY: "H2VORORT" DELIVERED A FIRST DETAILED PLANNING FOR 180 DSO IN THE GAS DISTRIBUTION TRANSFORMATION PLAN

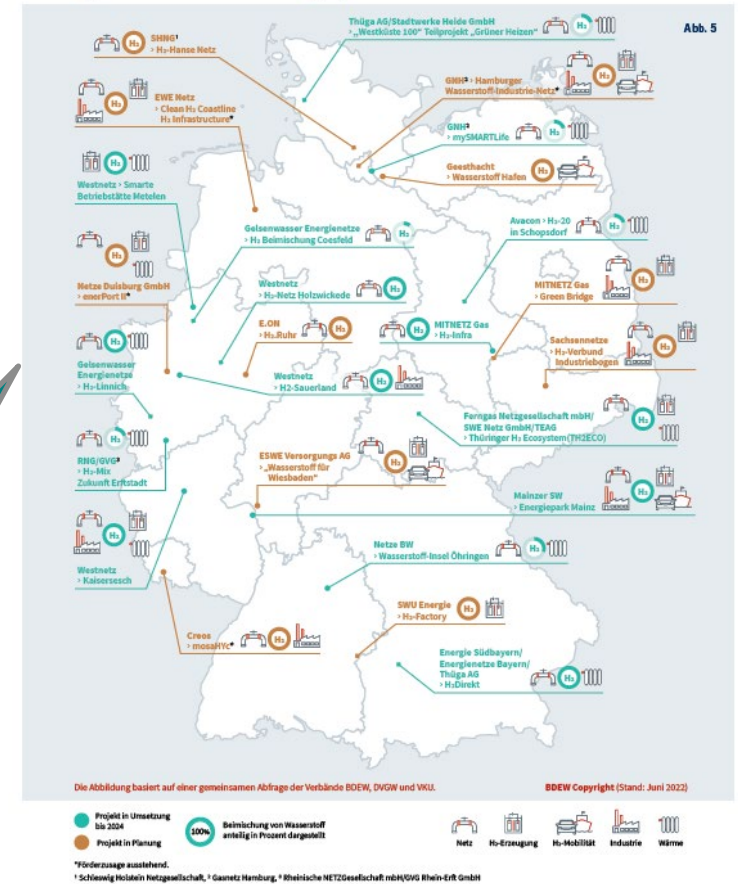


2023 the new planning process has already started. This time many more DSO will join. The TSO plan builds on the DSO plan. §52b can come!



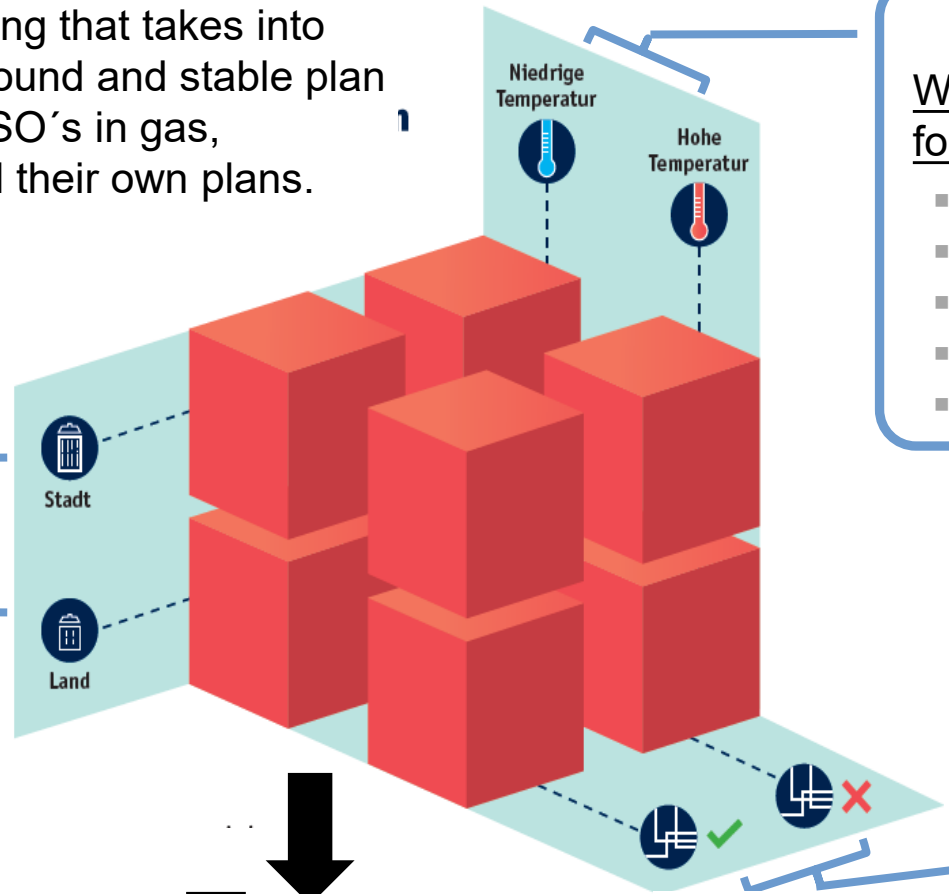
Many of these projects will develop into Hydrogen Valleys, supporting the RePowerEU targets. Through the local heating and cooling plans more cities define their energy infrastructures. Large cities like Frankfurt, Nürnberg, Chemnitz, ... have already declared that without hydrogen distribution tis will not be possible

BDEW (2022): Übersicht dezentraler Wasserstoffprojekte mit Schwerpunkt im Verteilernetz, basierend auf einer gemeinsamen Abfrage der Verbände BDEW, DVGW und VKU im Rahmen der Erstellung des Wasserstoffberichts nach §28q EnWG.



ONLY DETAILED BOTTOM-UP PLANNING DELIVERS THE RIGHT NUMBERS TO BUILD INFRASTRUCTURE IN CITIES®IONS& COUNTRIES

Proposal of the Parliament for the Gasdirective very important. Only with a joint planning that takes into account the local specificities a sound and stable plan can be delivered, on which the TSO's in gas, hydrogen and electricity can build their own plans.



Dimension I

Which energy sources are available?

- Renewable electricity, waste heat, H2, Biomethane, low carbon gases, geothermal
- Local natural storages

Dimension II

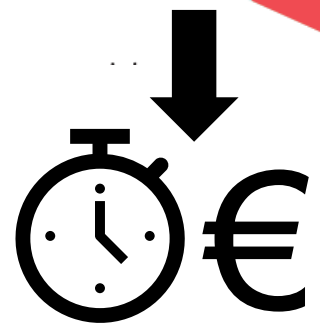
Which requirements do customers have for the use of energy?

- Heat
- Temperature-Level
- Technological use
- Mobility
-

Dimension III

Which infrastructures exist?

- District heating grid
- Gas grid, hydrogen grid
- Electricity grid



WE ARE STILL AT THE BEGINNING, EVERY WEEK NEW INVENTIONS ARE ANNOUNCED



The Coolest way to heat

The Cooll SuperHybrid combines the energy gain of a heat pump with the reliability of a central heating appliance, without extra electricity consumption. This creates an efficient heating solution that can be easily integrated into almost all homes. The SuperHybrid runs on natural gas, LNG, biogas and hydrogen.

Product description

- Basic appliance with internal outdoor air exchanger
- 10 kW heating power
- Provision for domestic hot water and peak power
- Dimensions: 50 x 60 x 120 cm (depth x width x height)
- Required air ducts for connection to outside: 50 x 40 cm (depth x width)

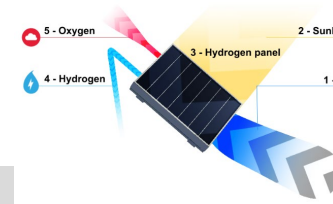
Advantages

- Silent, compact and comfortable
- Replacement within a day
- Annual savings of at least 30 %
- Suitable for standard radiators (high temperature)
- Also works at low outside temperatures well below zero
- Natural refrigerant without GWP (Global Warming Potential)
- The same ease of use and comfort as you are used to from your central heating boiler

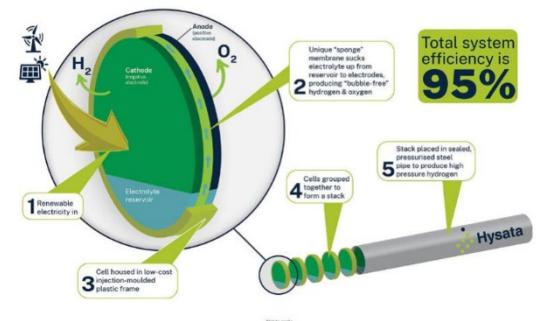
Options

- The SuperHybrid heats buffer tank for efficient domestic hot water preparation
- Combination with solar thermal buffer tank
- Heat recovery from ventilation air for improved efficiency
- Water/water heat pump variant for use with external heat source (and based source, PV)

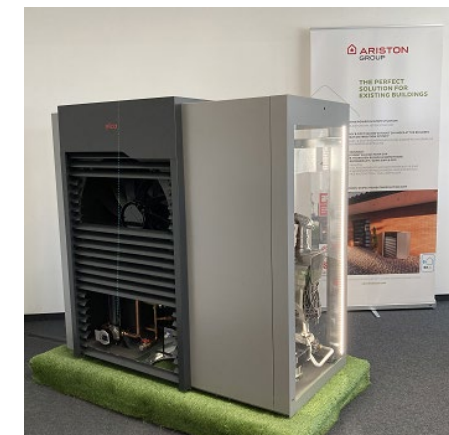
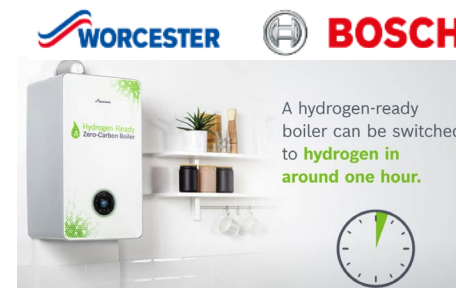
Solhyd makes green hydrogen accessible to everyone.



How Hysata's Capillary-Fed Electrolysis (CFE) cell works

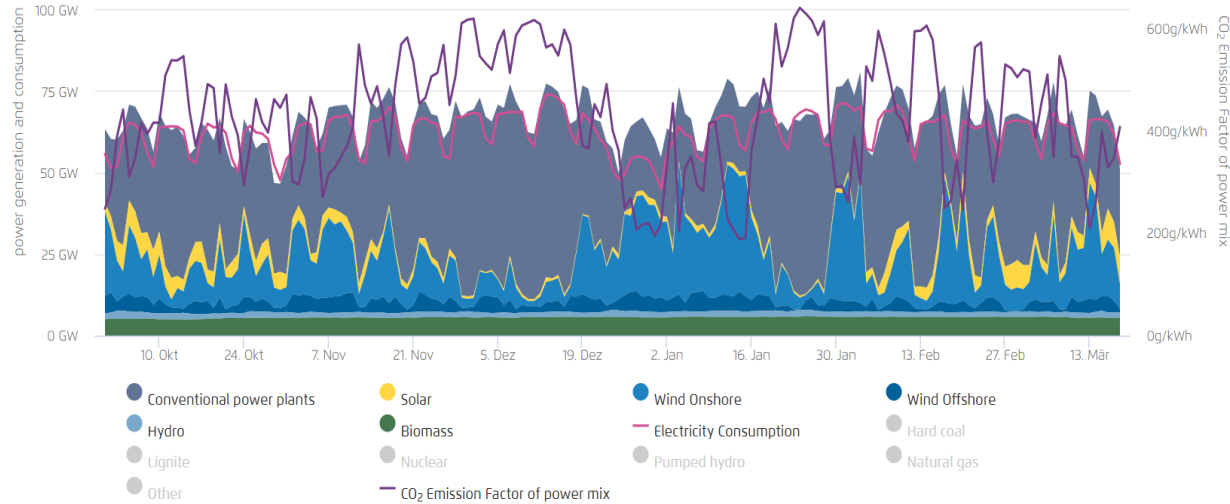


E-TAC is a revolutionary method for producing green hydrogen by splitting water that is over 95% efficient, safe and cost-competitive with fossil-fuel hydrogen.

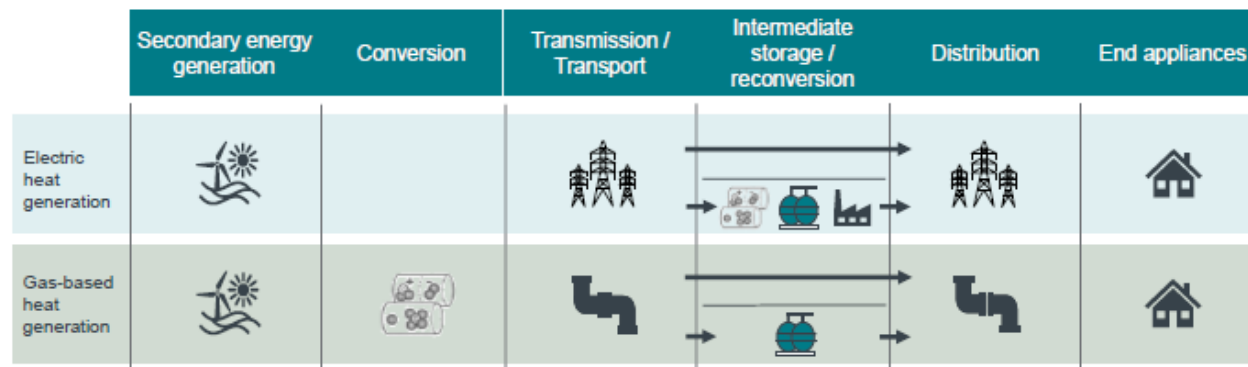


BACKUP

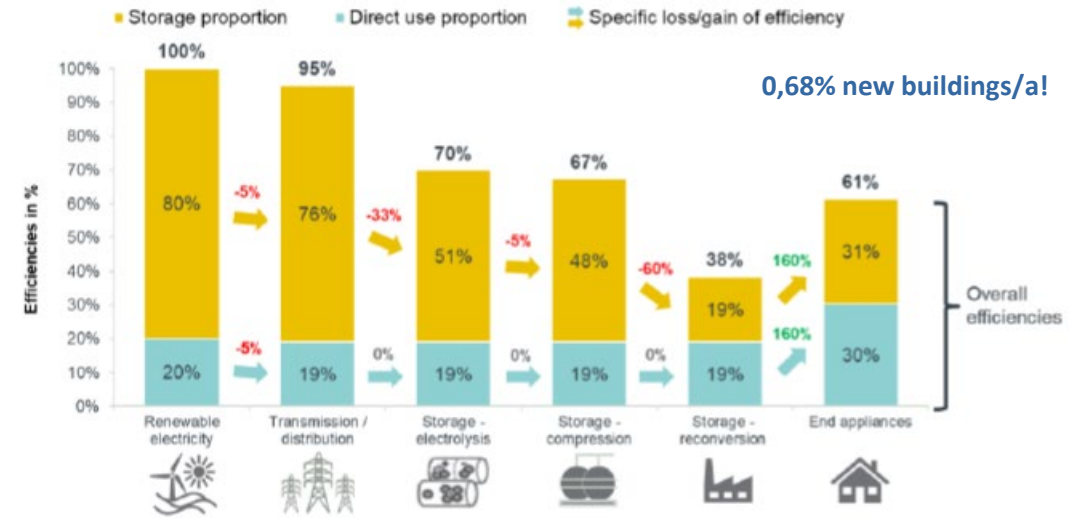
THE DISCUSSION ABOUT H2 IN HEATING IS POLITICAL AND NOT FACT BASED



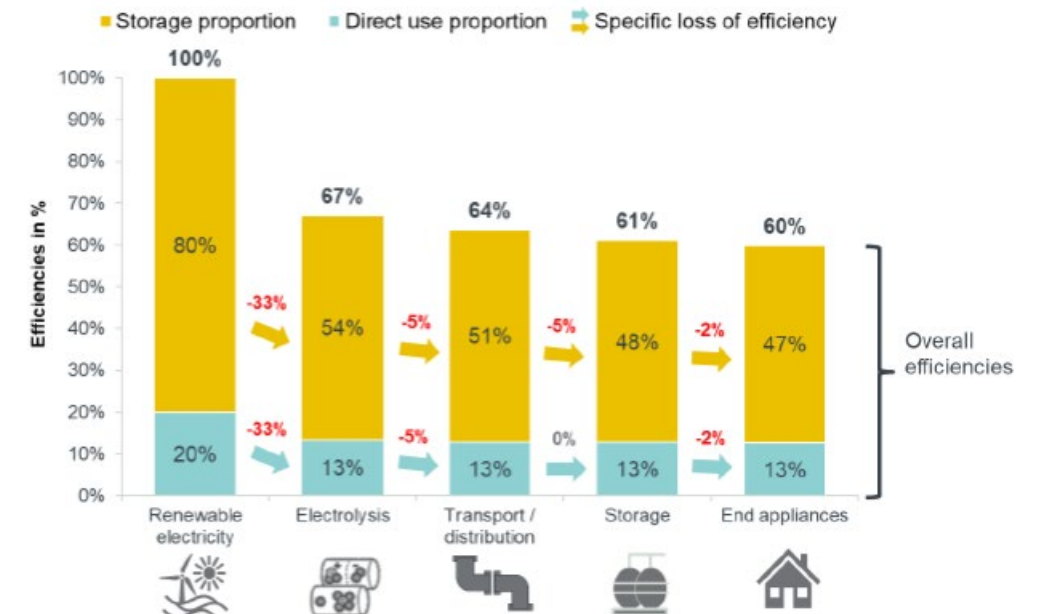
Source: [Agorameter](#)



Electric air source heat pump („cold day“, old building, 80% intermediate storage)

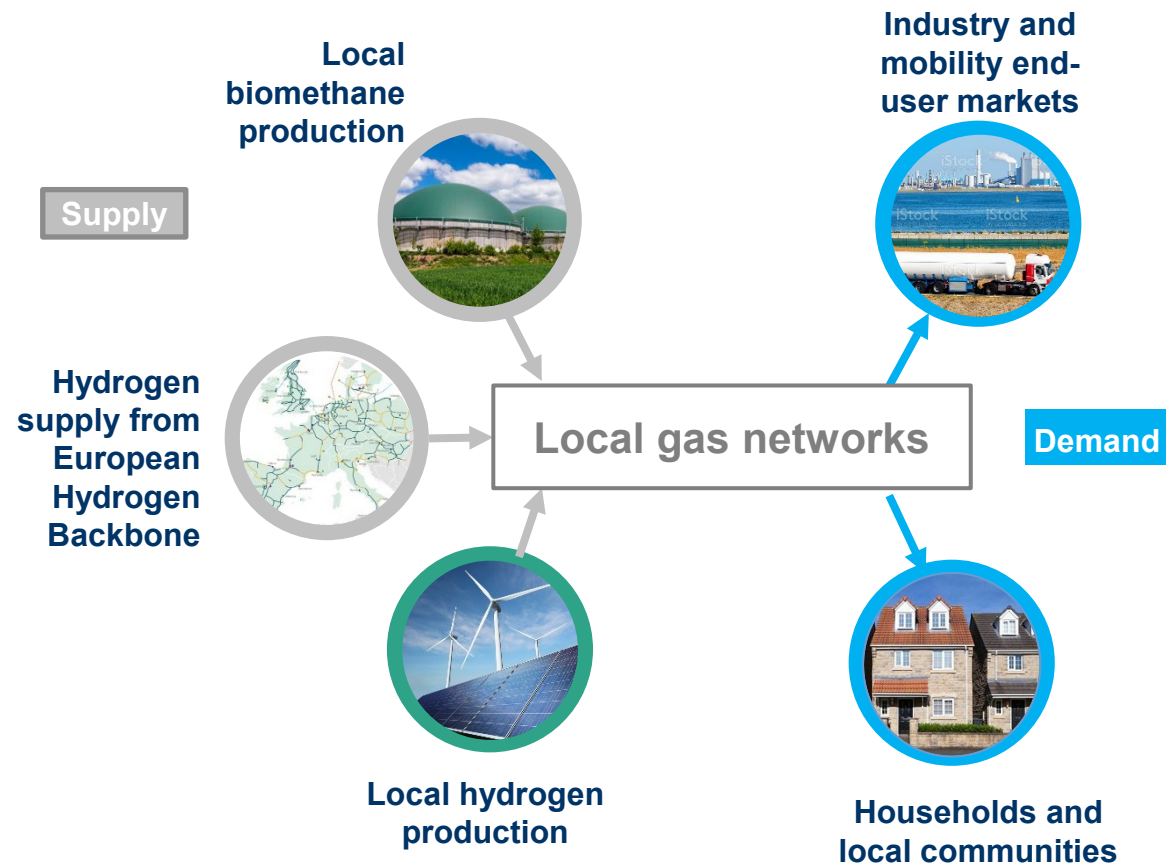


H2 condensing boiler („cold day“, new & old building, 80% intermediate storage)



Source: Frontier economics: THE VALUE OF HYDROGEN IN THE HEATING MARKET,

GAS DISTRIBUTION GRIDS FORM THE BRIDGE BETWEEN HYDROGEN PRODUCERS AND THE END CUSTOMERS



- Time is of the essence!
- Existing networks can be used almost immediately in contrast to new-built H2 networks which would take decades to build
- Many hydrogen production sites will be in proximity to the DSO and often they will be too small to be connected to the TSO.
- Distribution of biomethane **AND** hydrogen is possible with smart gas grids!
- Through the **cooperation** within Ready4H2 time and money can be saved by sharing knowledge, experiences and data across a wider Europe
- The faster the DSO are ready the fast the backbone can be created in the countries.