





H2 workshop with
Commissioner Kadri Simson

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THE THÜGA GROUP CONSTITUTES WITH NEARLY 100 COMPANIES THE LARGEST ALLIANCE OF MUNICIPAL UTILITIES SERVING REGIONS AND CITIES IN GERMANY

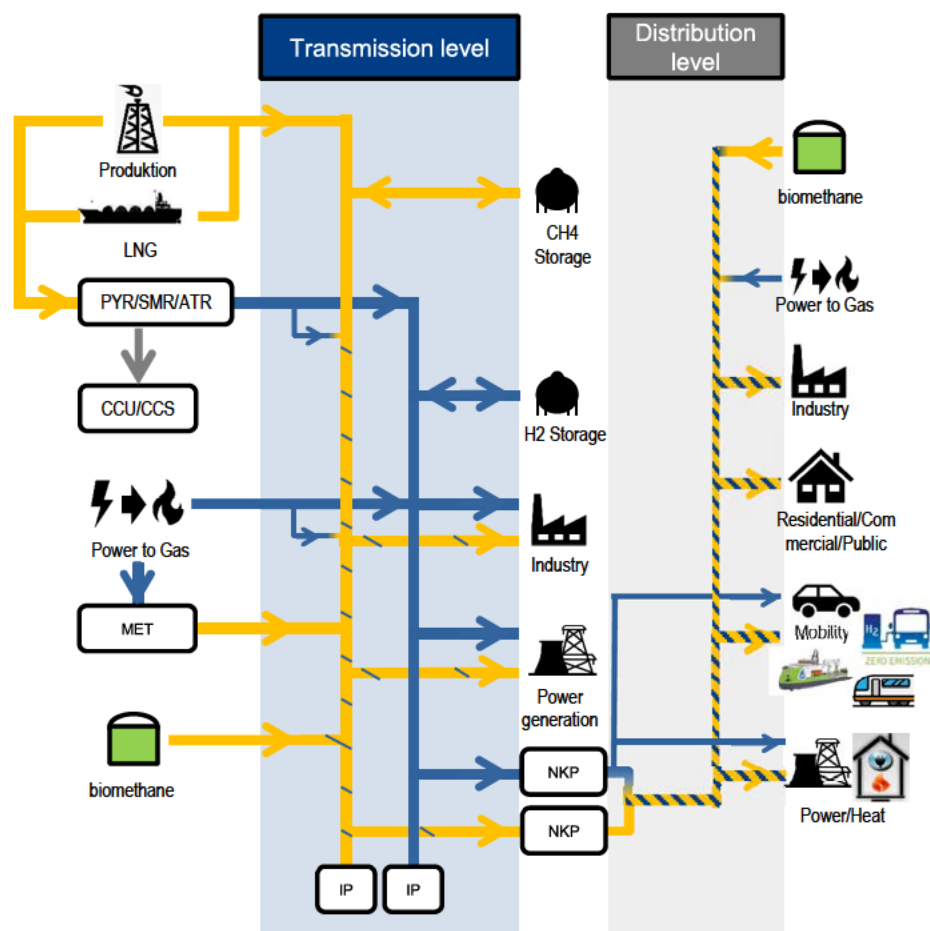
Turnover € 21.5 billion		Gas sales 118.8 billion kWh	Heating Sales 10.0 billion kWh
Investments € 1.3 billion		Electricity sale 57.5 billion kWh	Water sales 330.8 million m ³
			Gas customers 2.0 million
Employees 20.300			Electricity customers 4.4 million
		Heating customers 0.1 million	Water customers 1.0 million



Hydrogen projects:

- **Very large interest of the cities and regions for local hydrogen projects.** Sector integration is deeply rooted within Thüga companies due to the multi-utility concept
- 2013 first PEM in Germany injecting H₂ into the grid of DSO of Frankfurt
- Since 2018 continuous injection into DSO grid in Freiburg
- „Reallabor“ Heide, injection of 20 % H₂ in the DSO grid as part of a complex project with refinery, TSO-grid, cement factory, underground storage, green kerosene for airport.
- „Reallabor“ North Germany with P2G from wind and usage of H₂ in all sectors
- 100 % grid and methane pyrolysis in concrete planning
- Buy Hydrogen-Ready: project with associations from DE, A, CH and many German DSO to classify new/existing components on their H₂-Readiness

DSO BUILD ON THE PROPOSAL OF THE TSO TO ACHIEVE MAXIMUM SYSTEM FLEXIBILITY. OPTIMAL COMBINATION OF **LOCAL ENERGY** WITH SECURITY OF SUPPLY FROM THE TSO.



Possible developments on the transmission level

- Use of existing infrastructures
- Converting certain pipelines to 100 % **H2**
- Low H2 blending into the CH4 network. Level not harmful to large feedstock customers, storages, compressors, turbines
- Connect customers and DSO to **H2** and **CH4** grid according to their demand and individual situation

Distribution level

- **Use of existing infrastructure of the grid and the consumers**
- Individual solutions depending in the local situation possible as DSO are usually not interconnected
- Enables local injection of biomethane, hydrogen, blends, syngas
- Possibility for dedicated H2 delivery but also “deblending” with membranes for critical consumers

PYR = Pyrolysis	ATR=Autothermal Reformer
SMR = Steam Reformation	MET = Methanisation
CCU = Carbon Capture & Usage	IP = Interconnection point
CCS = Carbon Capture & Storage	NKP = TSO-DSO connection

THE MARCOGAZ TASK FORCE ANALYZED 63 REPORTS FROM ALL OVER THE WORLD. IT IS WORK IN PROGRESS AS CONSTANTLY NEW PROJECTS FEED-IN NEW KNOWLEDGE.

