SECTOR COUPLING

ElevateCEE 2nd Working Conference, Project Pitch Session

Gyor, Hungary - 3rd June 2026

Peter Demeč, Head of Strategy

Distribúcia SPP

33 400 km
of gas distribution network

1.5 million
Connected gas consumers

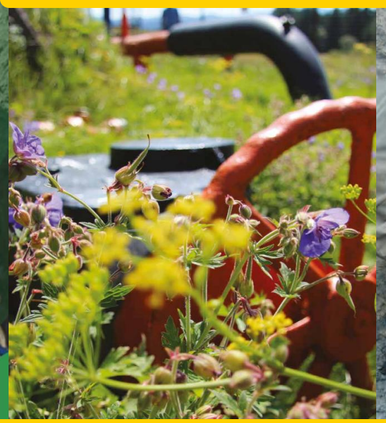
1 323
Number of employees

SAFETY OF THE NETWORK AND REDUCTION OF METHANE EMISSIONS

94 %
of Slovakia has access to natural gas

45 TWh / 30 TWh
Slovak yearly GAS / Electricity consumption

INTEGRATION OF RENEWABLE GASES INTO THE DISTRIBUTION NETWORK



Slovak Gas DSO

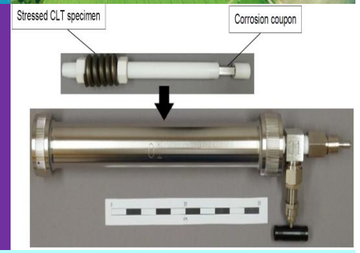
Distribúcia SPP

Our Hydrogen projects

2022 H2 PILOT

10% blending
area with of 300 consumers

2023 High Pressure STEEL testing



Impact of H2 on steel pipelines

2024 CERTIFICATION FOR BLENDING

Whole network certified for **H2 blends**
10% in cities, 5% high pressure grids

2026 H2DEMO

Polygon - 100% H2 tightness tests
of gas grid components

202? PURE H2 DISTRIBUTION TRIALS

Distribúcia SPP

Blending Offers Wide Range of Sector Coupling Solutions

Energy Storage (BESS, Hydrogen, Pumped Hydro)

Power-to-Gas:

Supporting heating sector
(e. g. Energy communities)

Seasonal storage of electricity
for heating purposes via H2

PtG-to-Power: Supporting Power sector

Flexibility (shift generation/consumption in time)
↓
Ancillary Services (frequency control, reserves, voltage support, black start)

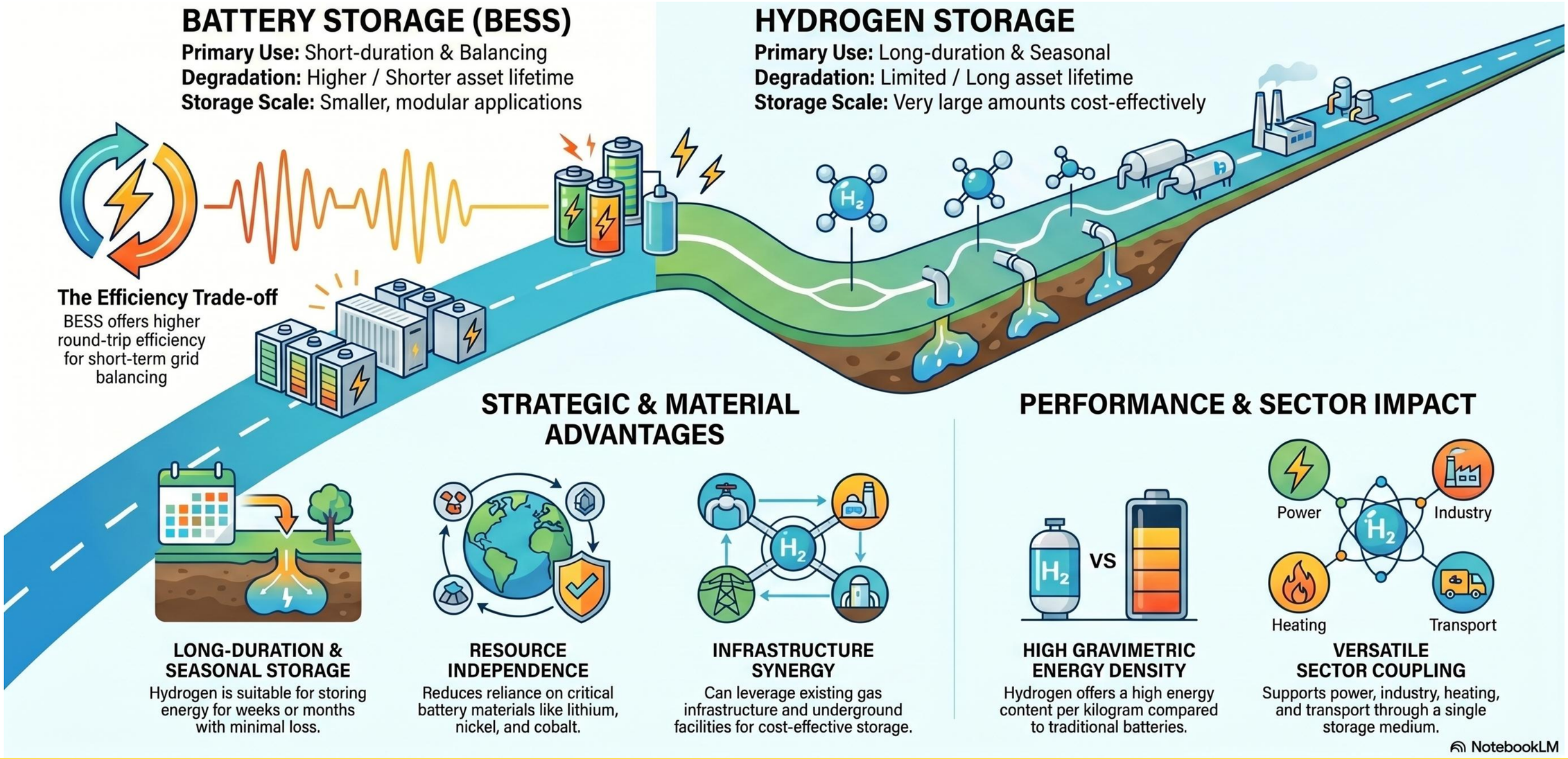
Hydrogen vs. Battery Storage: The Long-Term Energy Solution

BATTERY STORAGE (BESS)

Primary Use: Short-duration & Balancing
Degradation: Higher / Shorter asset lifetime
Storage Scale: Smaller, modular applications

HYDROGEN STORAGE

Primary Use: Long-duration & Seasonal
Degradation: Limited / Long asset lifetime
Storage Scale: Very large amounts cost-effectively



The Efficiency Trade-off

BESS offers higher round-trip efficiency for short-term grid balancing

STRATEGIC & MATERIAL ADVANTAGES

LONG-DURATION & SEASONAL STORAGE

Hydrogen is suitable for storing energy for weeks or months with minimal loss.

RESOURCE INDEPENDENCE

Reduces reliance on critical battery materials like lithium, nickel, and cobalt.

INFRASTRUCTURE SYNERGY

Can leverage existing gas infrastructure and underground facilities for cost-effective storage.

PERFORMANCE & SECTOR IMPACT

HIGH GRAVIMETRIC ENERGY DENSITY

Hydrogen offers a high energy content per kilogram compared to traditional batteries.

VERSATILE SECTOR COUPLING

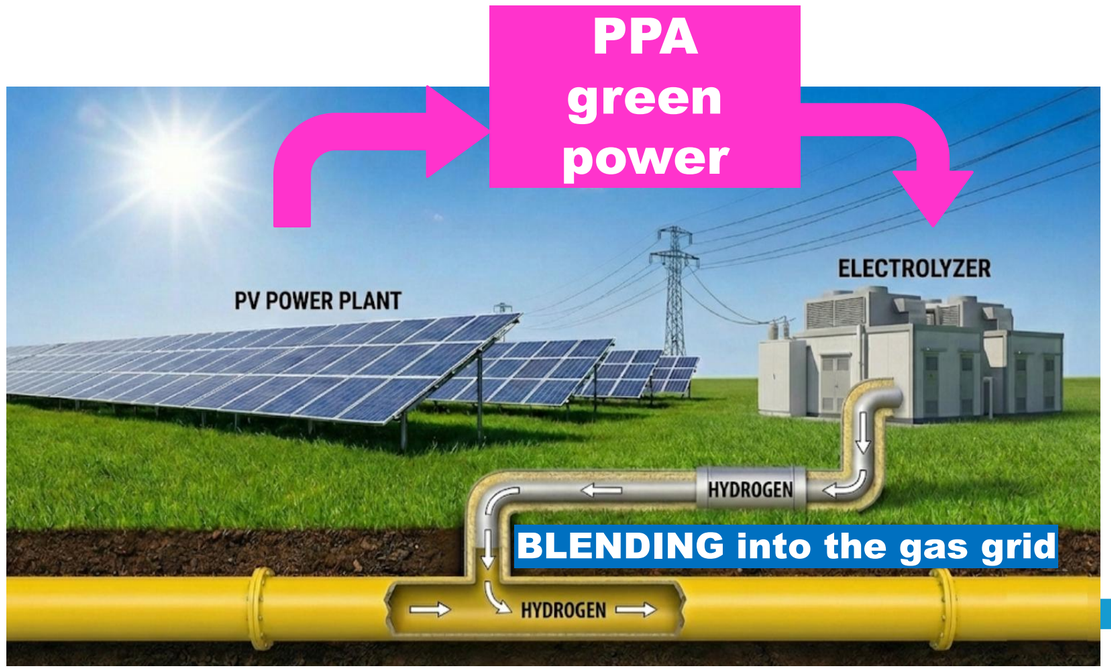
Supports power, industry, heating, and transport through a single storage medium.

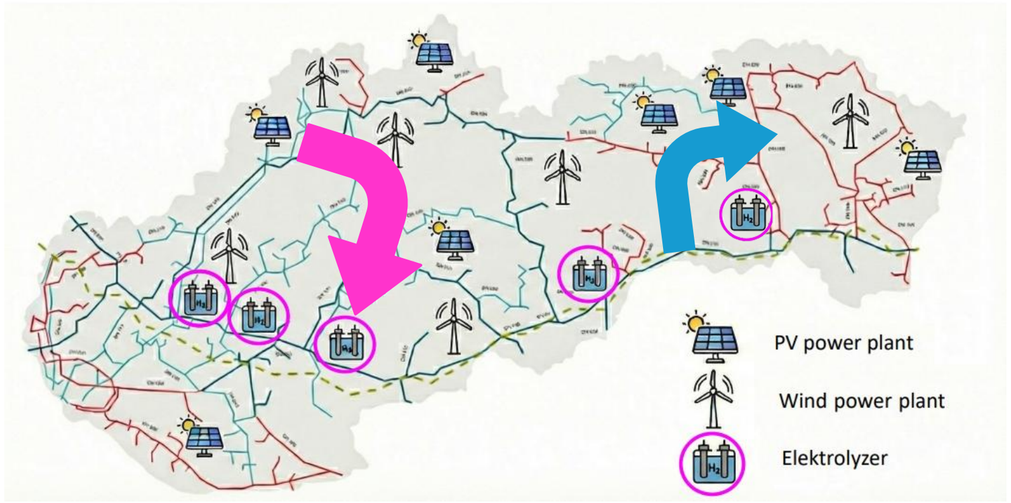
NotebookLM

Centralized Blending Enables Sector Coupling

- ✓ Continuous flow
- ✓ Large volumes incl. summer
- ✓ Only one way flow
- ✓ On the interface with future H2 backbone – possible upstream injection

Centralized Blending Enables Sector Coupling





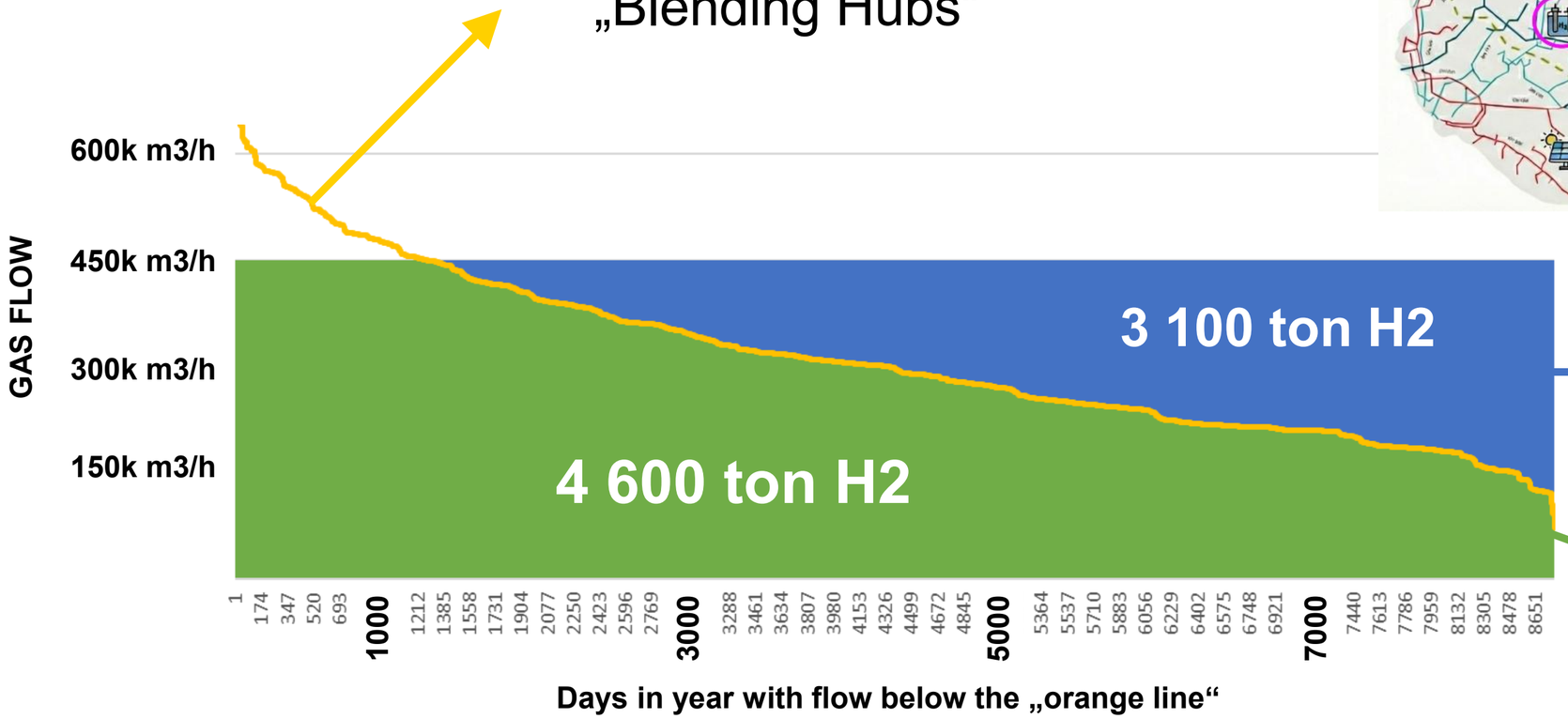
Indirect use of Green molecules using GOs

Increasing blending % offers future Scale-ups for Sector Coupling

2% blending

50 MW electrolysis (ca 5x10 MW)

Cumulative hourly Gas flow in „Blending Hubs“



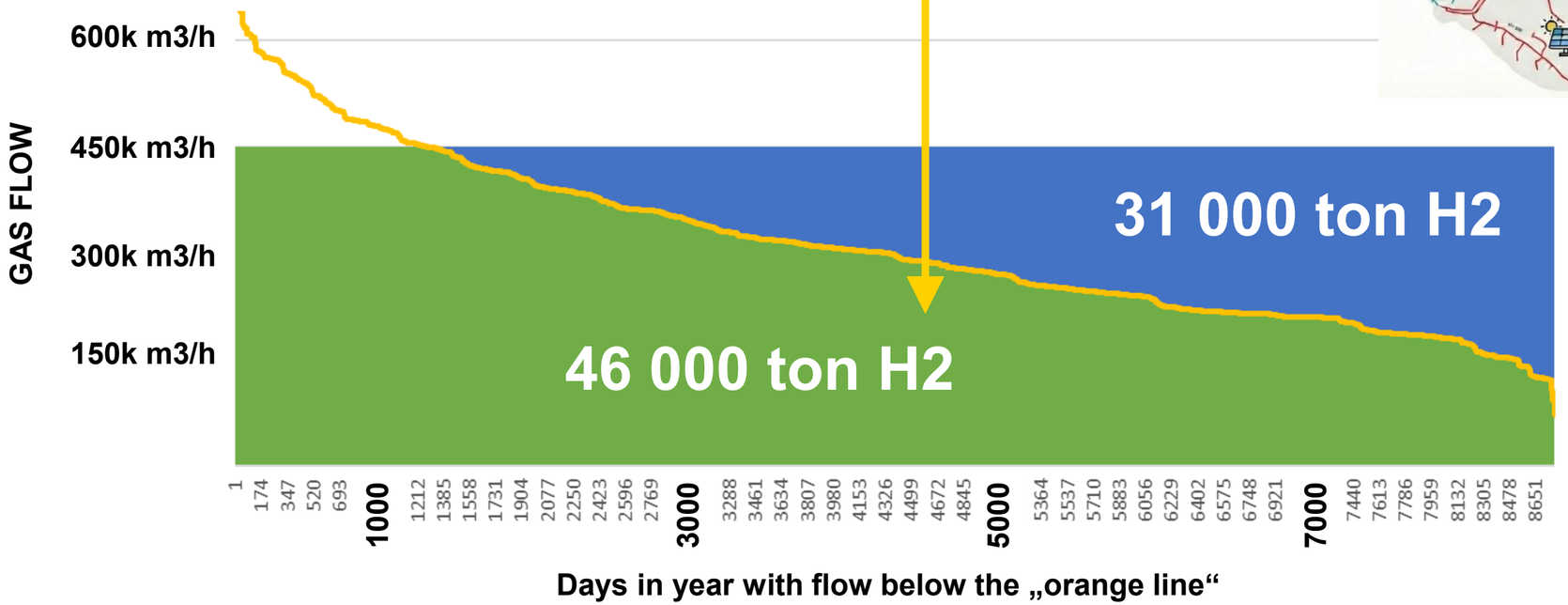
What cannot be blended into the Gas grid, can be used directly in Transport (HRS)

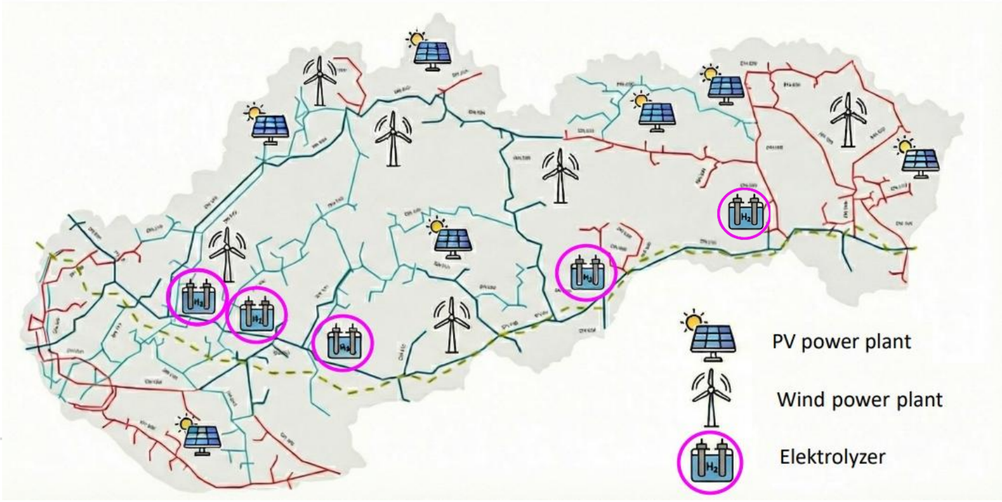
H2 volume that can be blended in the Gas grid respecting **2% limit**

Increasing blending % offers future Scale-ups for Sector Coupling

20% blending

10-times more
H2 volumes to be blended





500 MW electrolysis (ca 5x100 MW)

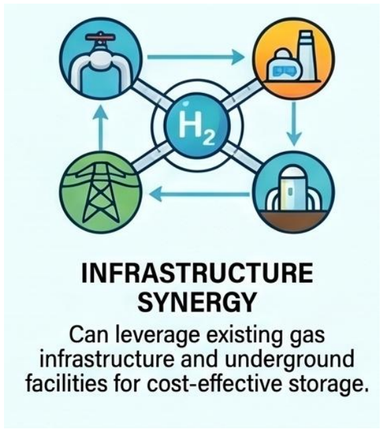
What do we need?

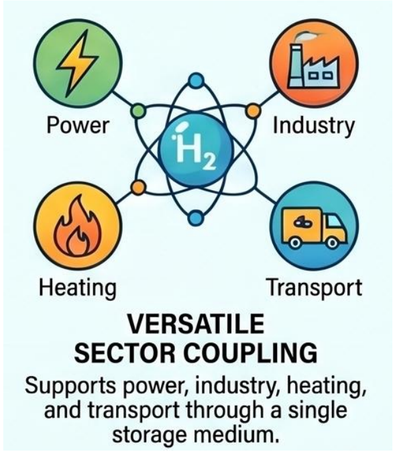
1. System approach

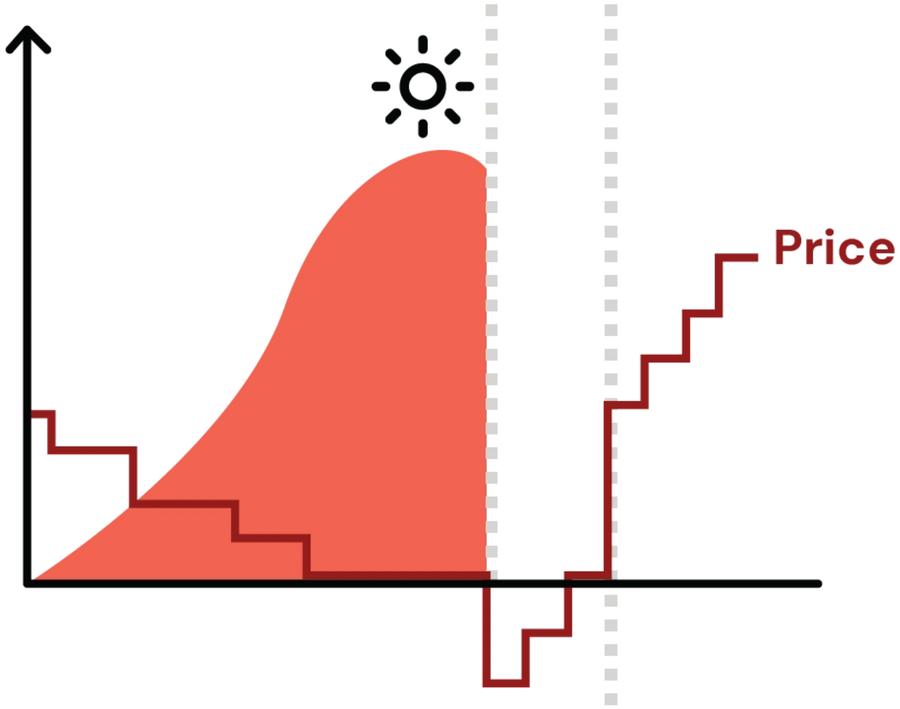
Nation-wide / Regional study: Prediction of future needs for Sector coupling

2. Demand mapping

- Green electricity producers
- Prosumers (larger-scale)
  – summer: excess electricity ; winter: heating needs
- Energy communities
- Electricity Grid operators
- Transport Sector (HRSs)







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