Energy Institute
London, 7 October 2019

The Role of Energy Infrastructure in the European Long-Term Vision for a Climate-Neutral Economy - the role of gas infrastructure and the flexibility of the system for a climate-neutral economy

Boyana Achovski, Secretary General, GIE

Gas infrastructure is essential to decarbonise energy

Paris Agreement COP21 - 195 countries agreed to limit global warming to well below 2C cf 1990 temps

Challenge - net-zero carbon emissions by 2050

Problem – EU responsible for 10% global GHG emissions and energy responsible for 75% GHG emissions (and demand is growing)

Solution – decarbonised energy (gas and elec)

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

Affordable decarbonisation cannot be achieved without using the gas infrastructure

GIE – the Voice for Gas Infrastructure in Europe

GIE is the European representative association for 70 members in 26 EU Member States. Established in 2005.

GIE represents the sole interest of the infrastructure industry in the gas business under three columns:

- Transmission (TSO)
- Storage (SSO)
- LNG (LSO)

GIE focus on the value created from our assets for consumers and users.

GIE works in focused Working Groups under the Annual Working Program

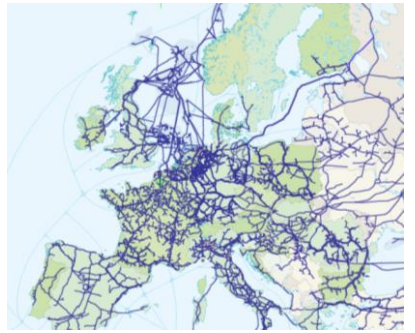
GIE - committed to achieving EU climate targets

infrastructure integration innovation
delivering energy into the future

infrastructure

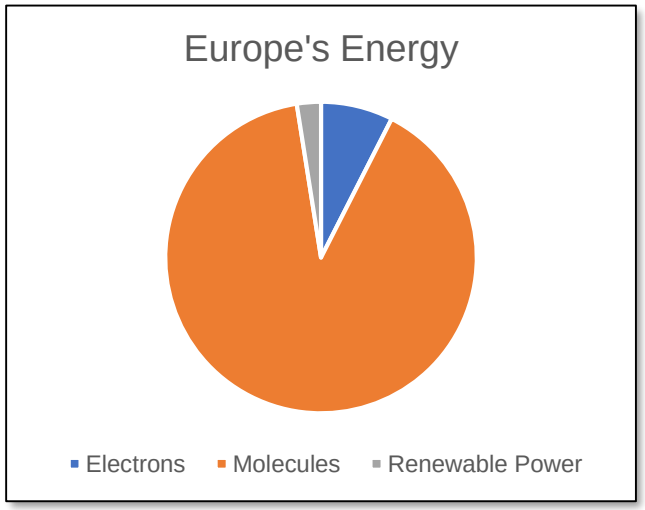


Reliable, secure, affordable energy supply throughout EU



Cost effective way to decarbonise energy

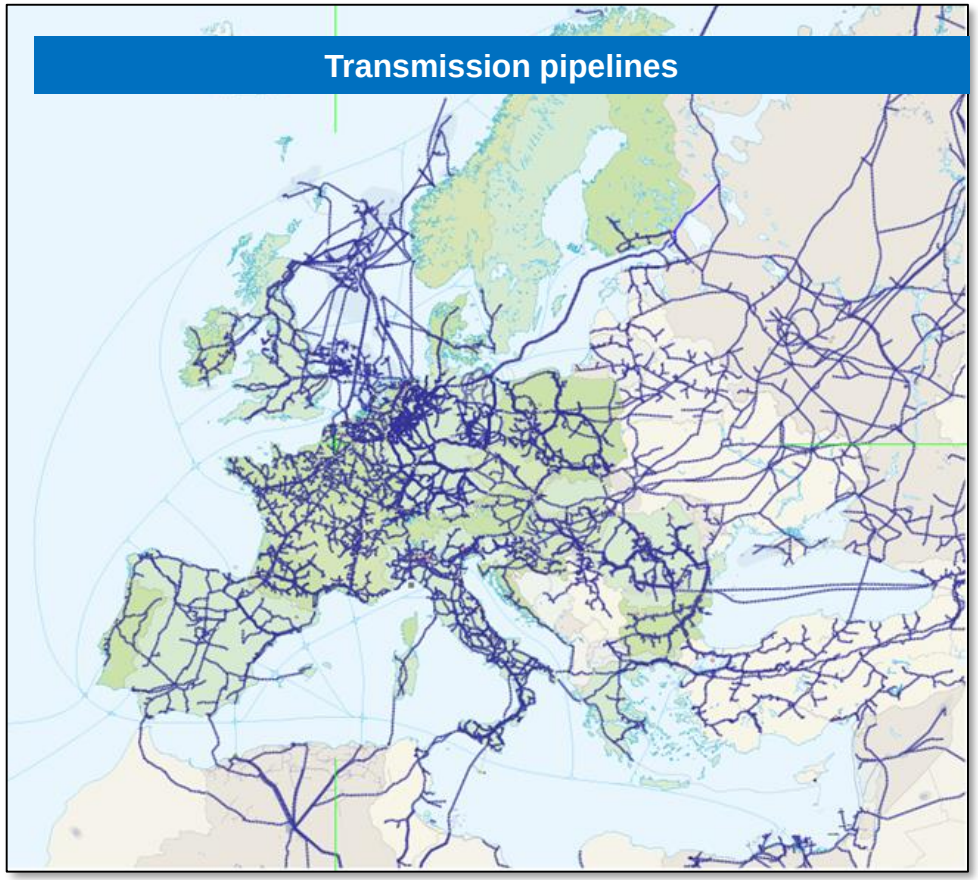
LNG, storage and gas transmission – reliable energy system connecting all Europe



1 000 GW
cross-border capacities
>100% of EU demand

270 GW
EU wind & solar capacity

Gas cross-border transmission capacity equals more than 3x current wind/solar capacity

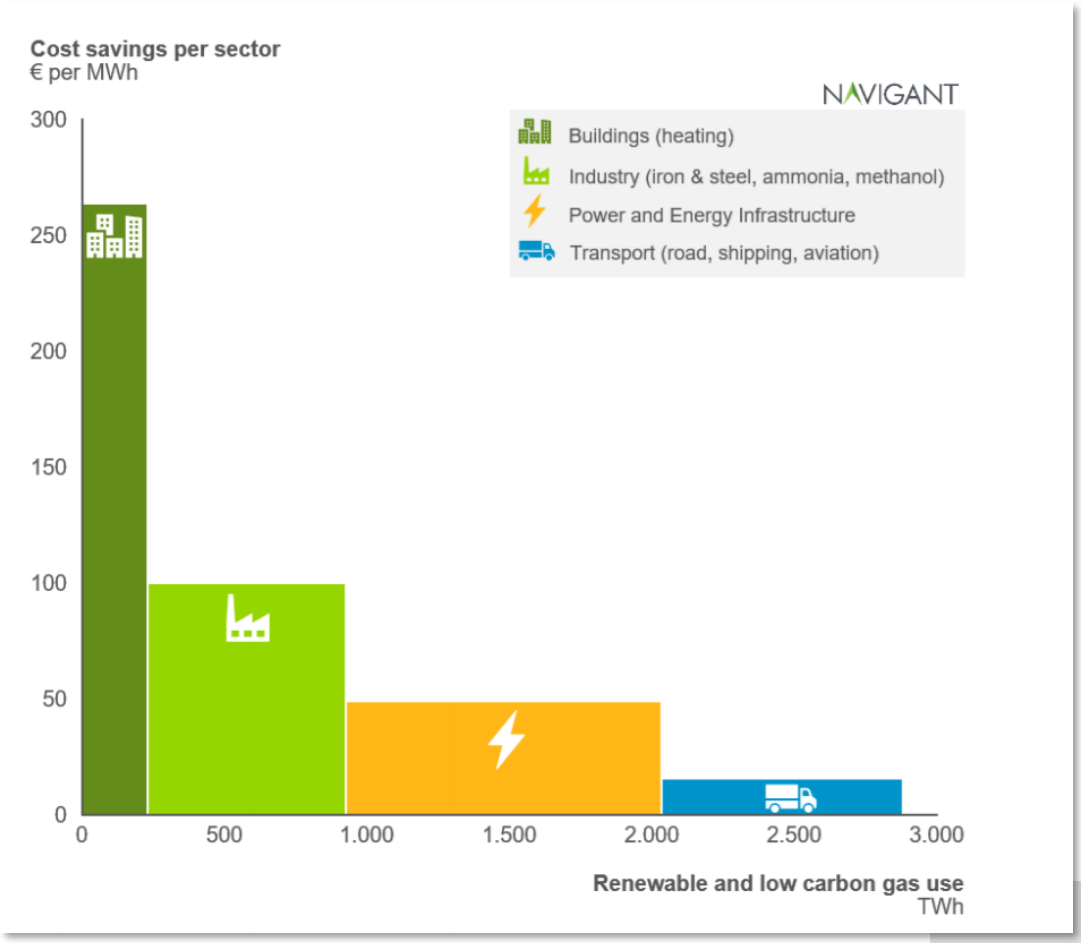


Data sources : European Environment Agency, ENTSOG TYNDP 2018, EuroStats 2016, GIE maps

Using gas infrastructure is a cost-effective way to decarbonise energy

Estimated savings for EU, based on higher share of bio/synthetic gas and use of gas infrastructure vs all-electric scenario:

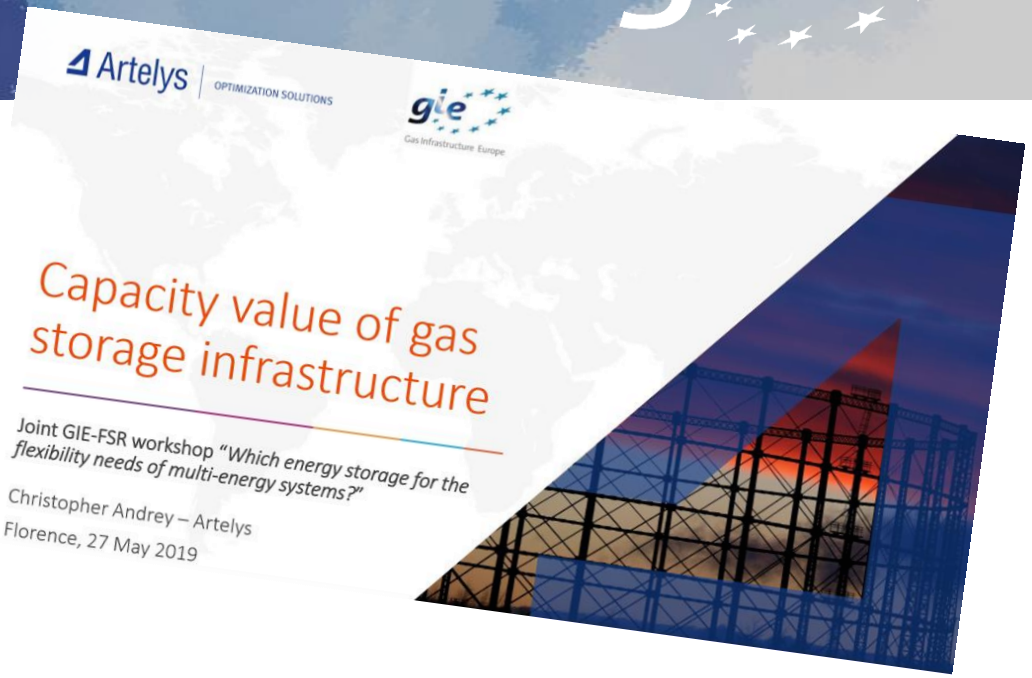
- Pöyry 2018 *Decarbonisation Study* - **€94 Bn pa savings**
- Ecofys (Navigant) 2018 *Gas for Climate Study* - **€138 Bn pa savings**
- Eurogas 2018 *PRIMES Study* - **€335 Bn total savings**
- Navigant 2019 *Gas for Climate Study* (update) - **€ 217 Bn pa saving**

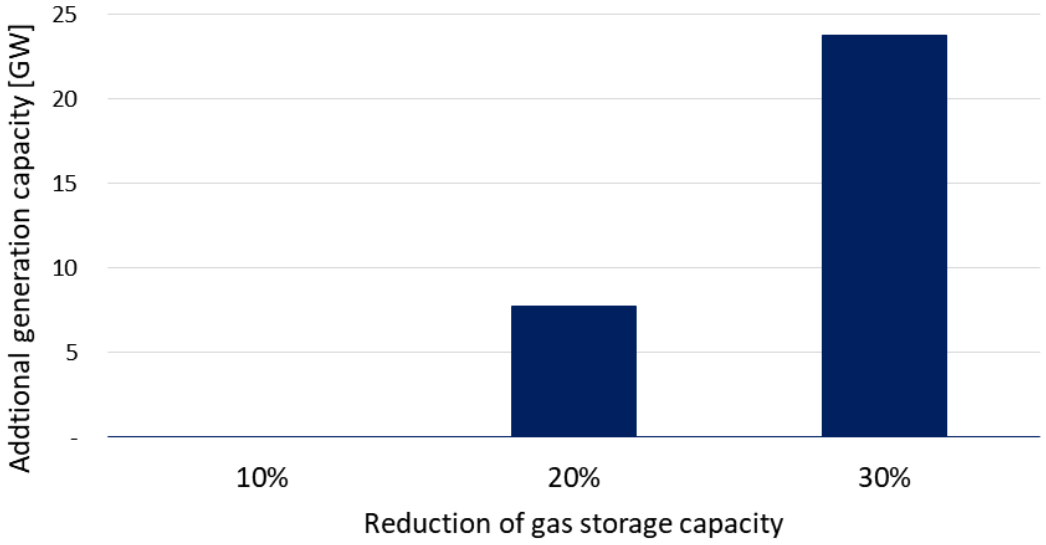


Artelys Study May 2019 – Value of Gas Storage

Main outcomes – gas infrastructure provides:

- **Flexibility and security;** insufficient flexibility for elec system to compensate in case of gas storage reduction
- **System value**; 10% storage reduction would cost €1B pa in additional elec networks
- **Less price volatility**; 30% reduction in gas storage would result in doubling of power prices and require 20MW additional capacity
- **Sector coupling**; ability of P2G to reduce power price volatility most effective with gas storage levels

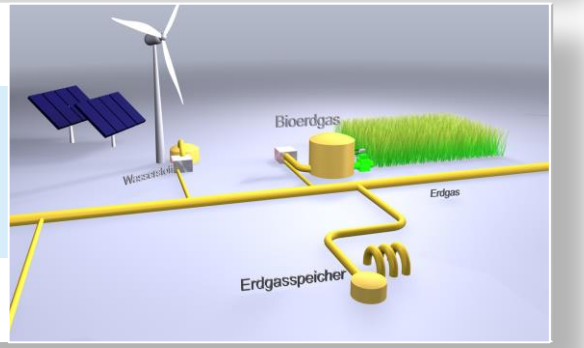




integration

Facilitates a developed EU energy market

Enables sector coupling/integration and renewable energy storage



Gas For Climate study March 2019: energy system can become fully renewable

- **Battery seasonal storage is unrealistic** even at strongly reduced costs.
- Full decarbonisation of high temp industrial heat **requires gas**.
- Possible to **sustainably scale-up renewable gas** at strongly reduced production costs.
- Blue hydrogen from natural gas with **CCSU** can be a scalable and **cost-effective option**.
- Potential for renewable hydrogen and biomethane to meet **80% demand** (270 bcm).

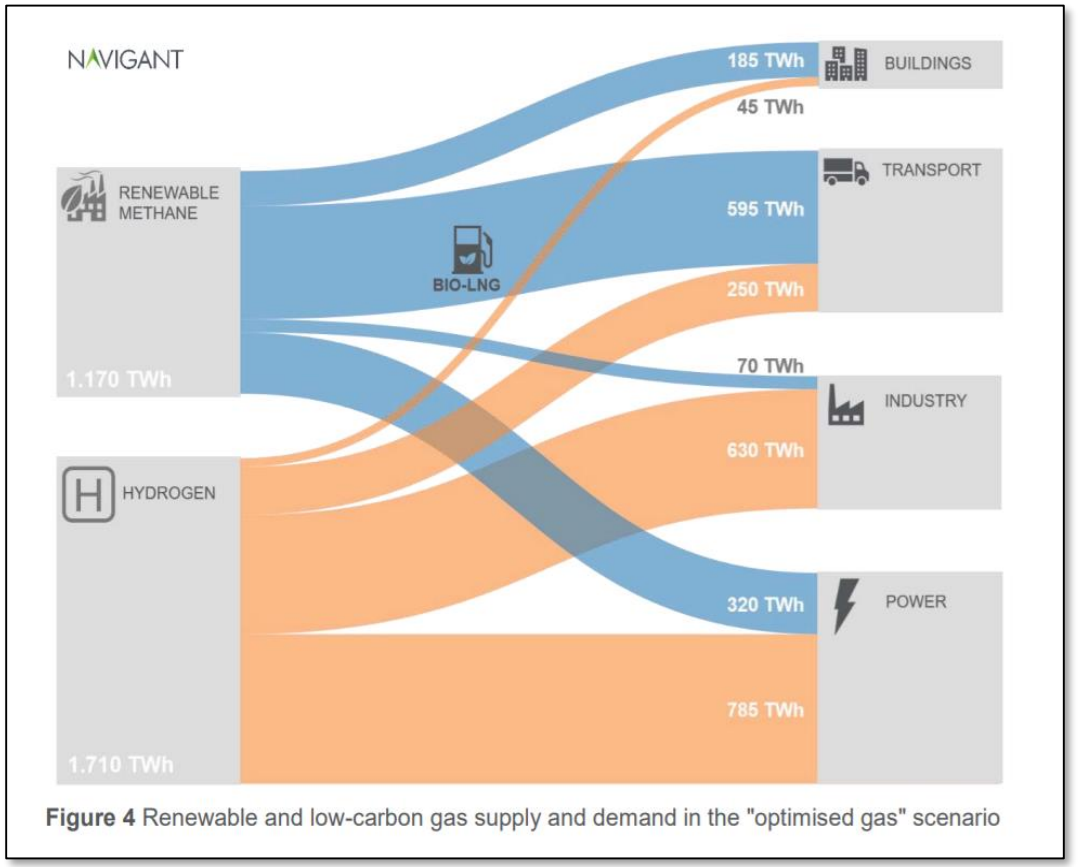


Figure 4 Renewable and low-carbon gas supply and demand in the "optimised gas" scenario

“GNI owns and operates one of the most **strategically important energy assets** in the country. GNI has a vision to utilise this strategic asset to assist Ireland in achieving a number of core national objectives.”

2030 Vision

11 TWh

RENEWABLE THERMAL & TRANSPORT ENERGY
9.5 TWh from Agri-AD

20% **NATURAL GAS** DISPLACED

5.5m **TONNES CO2 SAVINGS** ANNUALLY
3.2m Energy + 2.3m Non-Energy

375 AGRI AD PLANTS **ACROSS IRELAND**

11m TONNES ANNUALLY
SILAGE REQUIREMENT (or equivalent)

8m TONNES ANNUALLY
SLURRY REQUIREMENT (or equivalent)

INVESTMENT
€3b

18 CENTRALISED INJECTION POINTS

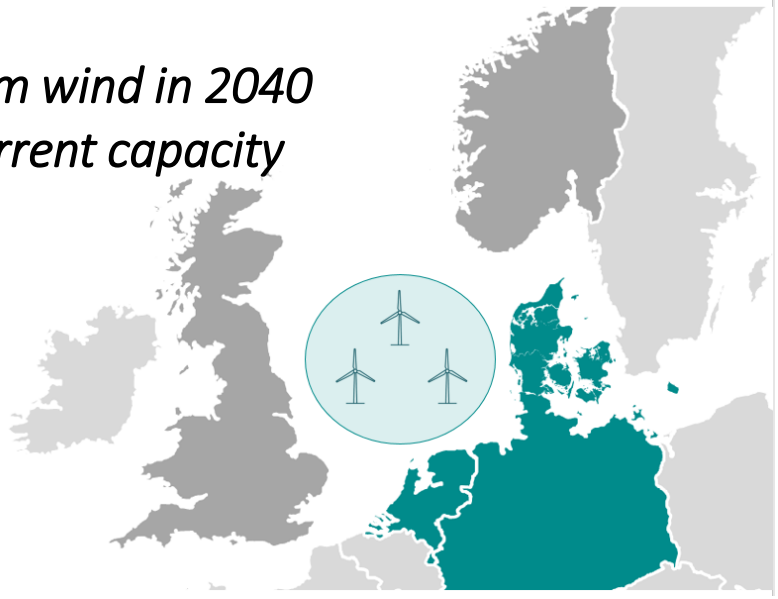
560 SPECIALIST GAS TRANSPORTATION TANKERS

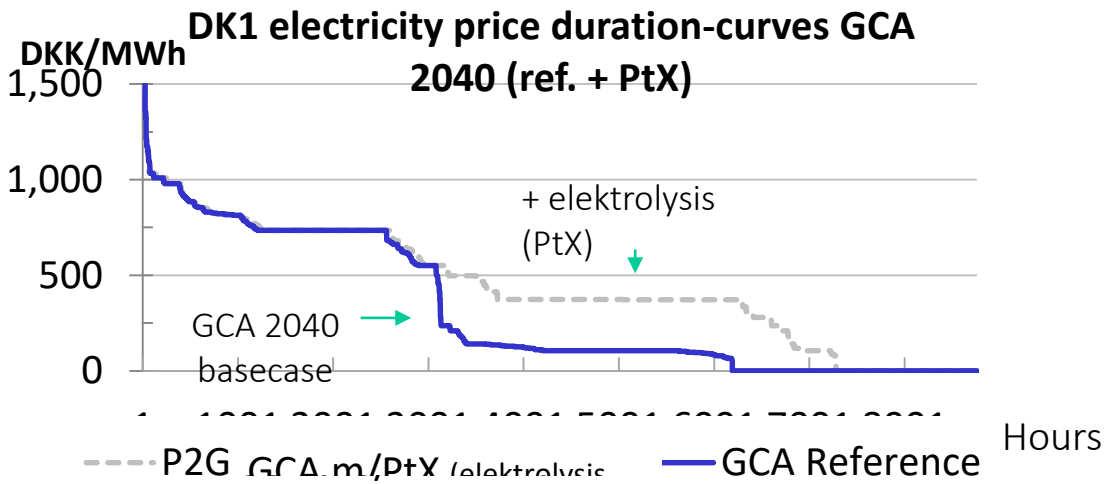
Gas Networks Ireland

Denmark – PTX increases value of wind/PV

- The existing DK energy system **cannot deliver without change**
- North Sea is an important resource – 70-150 MW in 2040 (7-15 x current capacity)
- **PTX can increase the value of wind and PV-scenario:**
  - Average market value for wind power and PV increases from approx 0.02 €/kWh in base case to 0.04 €/kWh in PtX-scenario

70-150 GW ifrom wind in 2040
App. 7-15 x current capacity

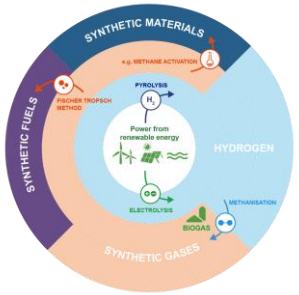




infrastructure integration innovation
delivering energy into the future

innovation

Gas infrastructure can accommodate renewable & decarbonised gases

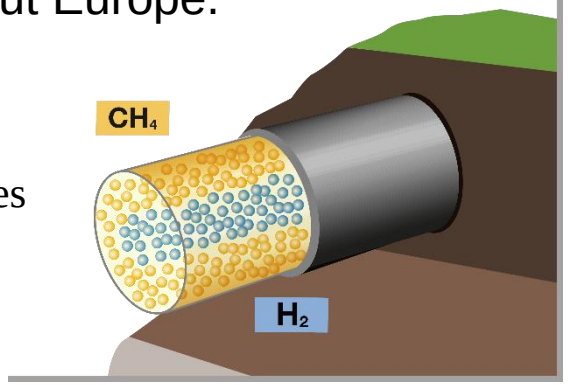


Facilitates increased energy efficiency with gas technology

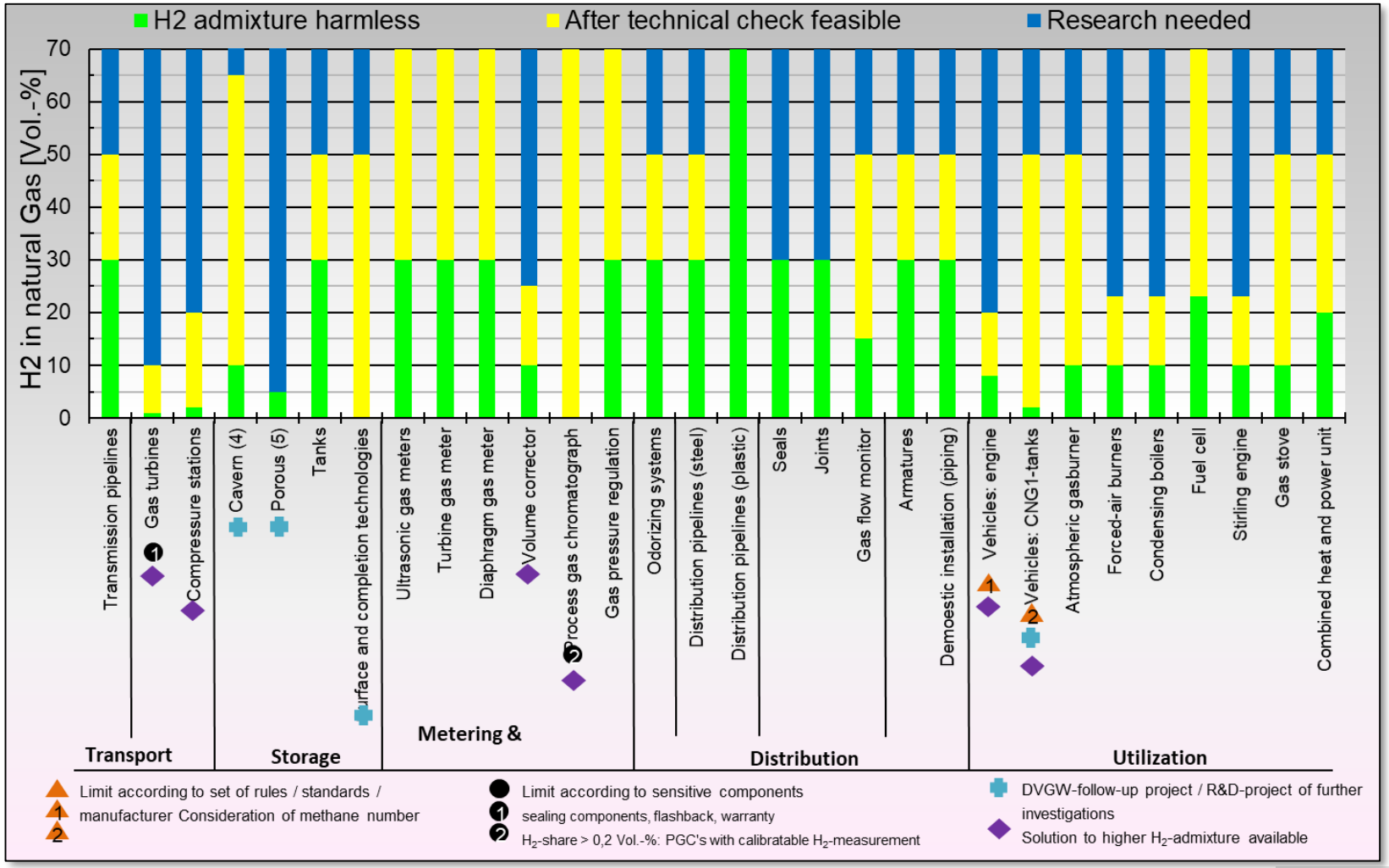
Innovation - gas system can accommodate hydrogen

- No technical/physical bottlenecks to transporting hydrogen have been removed.
- Max in EU is Germany at 10% allowed; full-scale tests aim for 20-25%.

Hydrogen transport within the gas grid creates a new *virtual energy grid* throughout Europe.



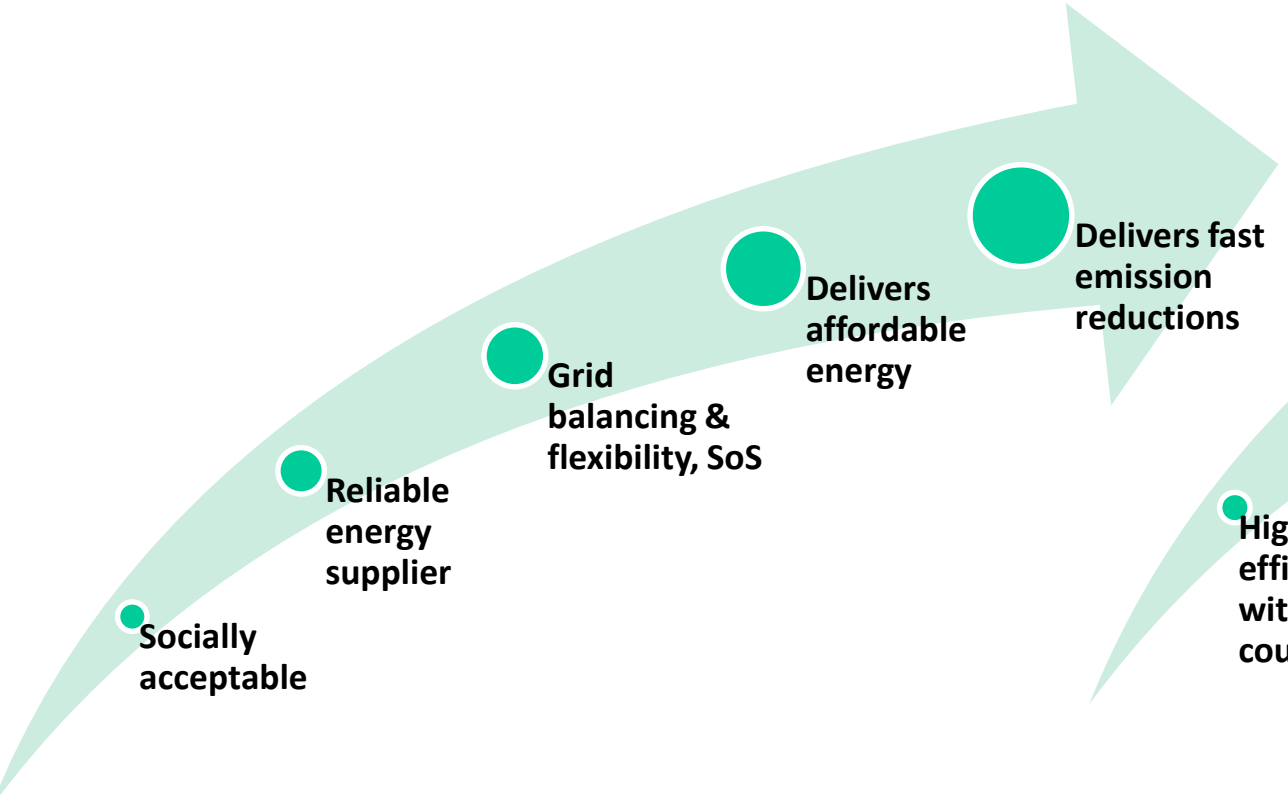
H2 pipeline carries 5x energy that electricity cable (nat gas x 15).



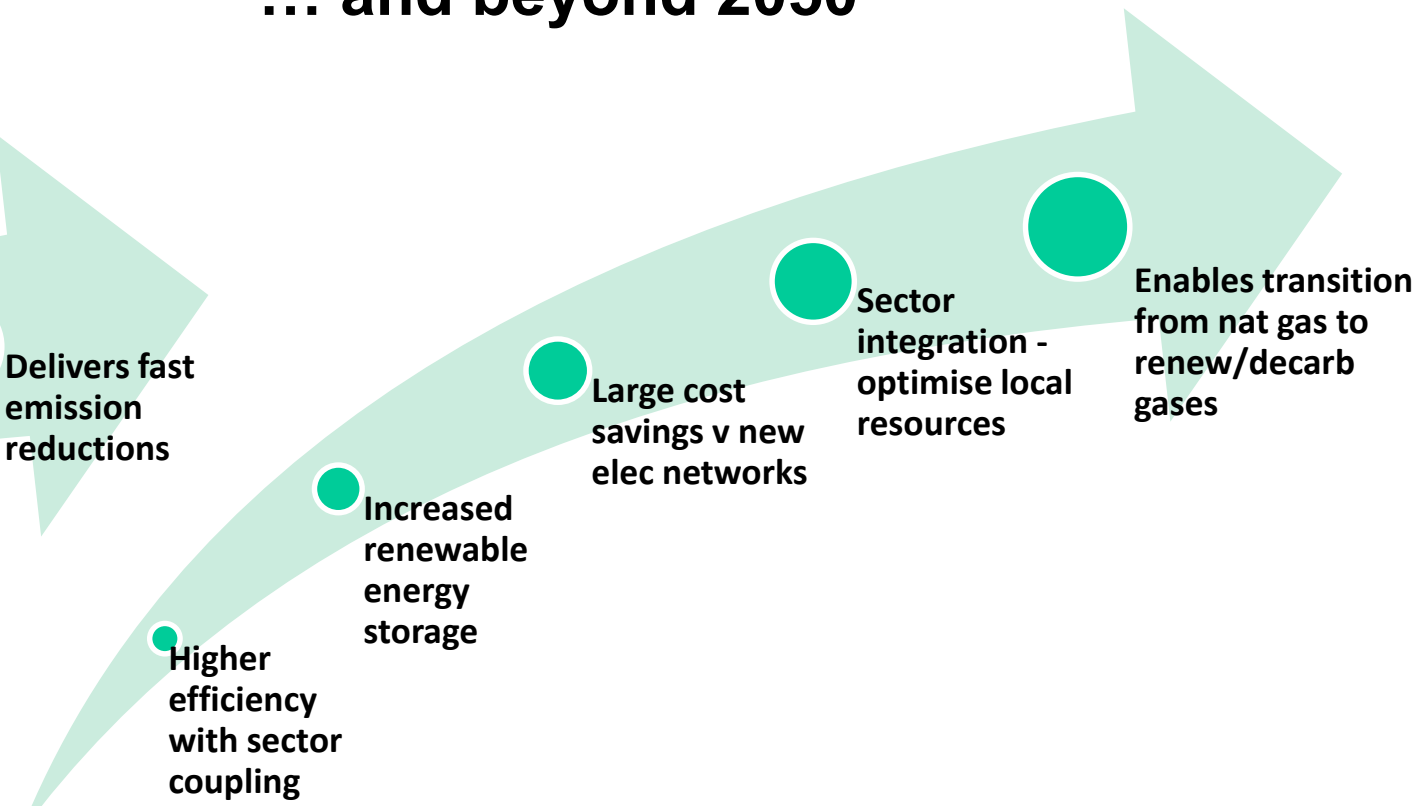
Source: DBI 2018

Role of the gas infrastructure in decarbonising energy

Essential now …



… and beyond 2050



Thank you