




Gas
Infrastructure
Europe

Can gas infrastructure accelerate transition to carbon neutrality?

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**How does the
design of the future
energy system
impact existing gas
infrastructure
operators?**

Building a green energy system with gas infrastructure

Where do we come from?

Gas infrastructure operators have guaranteed safe and reliable transport, storage and import of Natural Gas for decades

The world has turned further:

- EU Green Deal: carbon neutrality by 2050
- REPowerEU: gas diversification and decarbonization
- Need to integrate electricity and gas systems
- hydrogen needs to be transported, stored and imported
- **We are committed to fulfilling this task**



A hand is holding a pair of glasses with a reddish-brown frame. The lenses show a reflection of a lush green forest with many trees. The background is a solid green color.

Gas infrastructure is color-blind

Benefits of the gas infrastructure for integrating hydrogen



Retrofitting

- Enables hydrogen to be blended into natural gas
- (De)blending to enable quick decarbonisation wins and scale-up of (de)centralised hydrogen production/technologies
- Cost-effective transitional solution in several EU countries

Repurposing

- Using existing gas infrastructure to transport, store and import and export 100% hydrogen
- Cost- and time savings
- Minimising the need for new energy infrastructure

Building new infrastructure

- Connecting hydrogen supply and demand
- Infrastructure companies have the expertise to build, own and operate hydrogen infrastructure

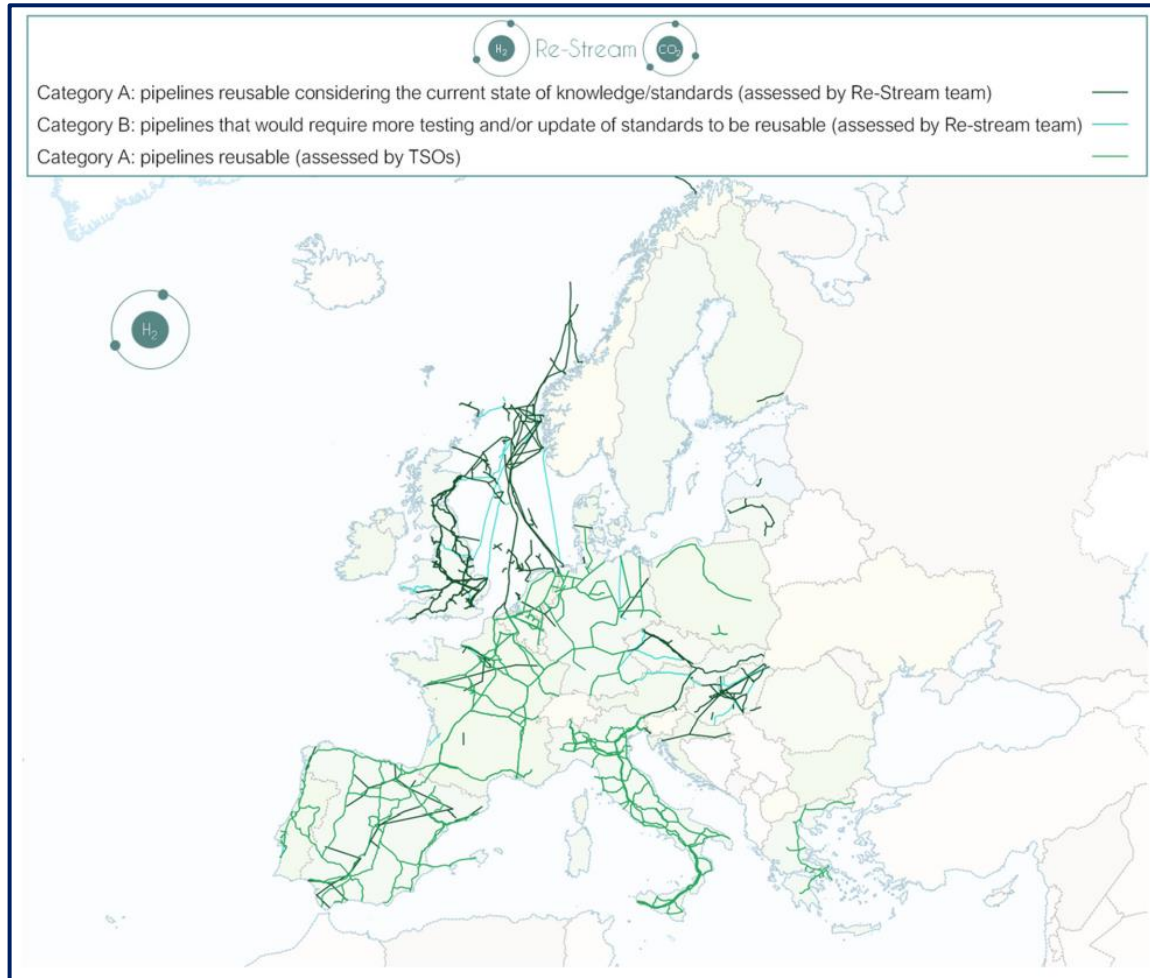
How to re-use gas infrastructure for hydrogen



Main conclusions

- Most of the offshore pipelines can be re-used for hydrogen transport.
- Close to 70% of the onshore pipelines can be re-used considering the current state of knowledge/standards.
- The remaining length of the pipelines is promising for re-use but would require more testing and/or update of standards to be re-usable.
- None of the pipelines analysed can be categorically excluded from re-use as of today.

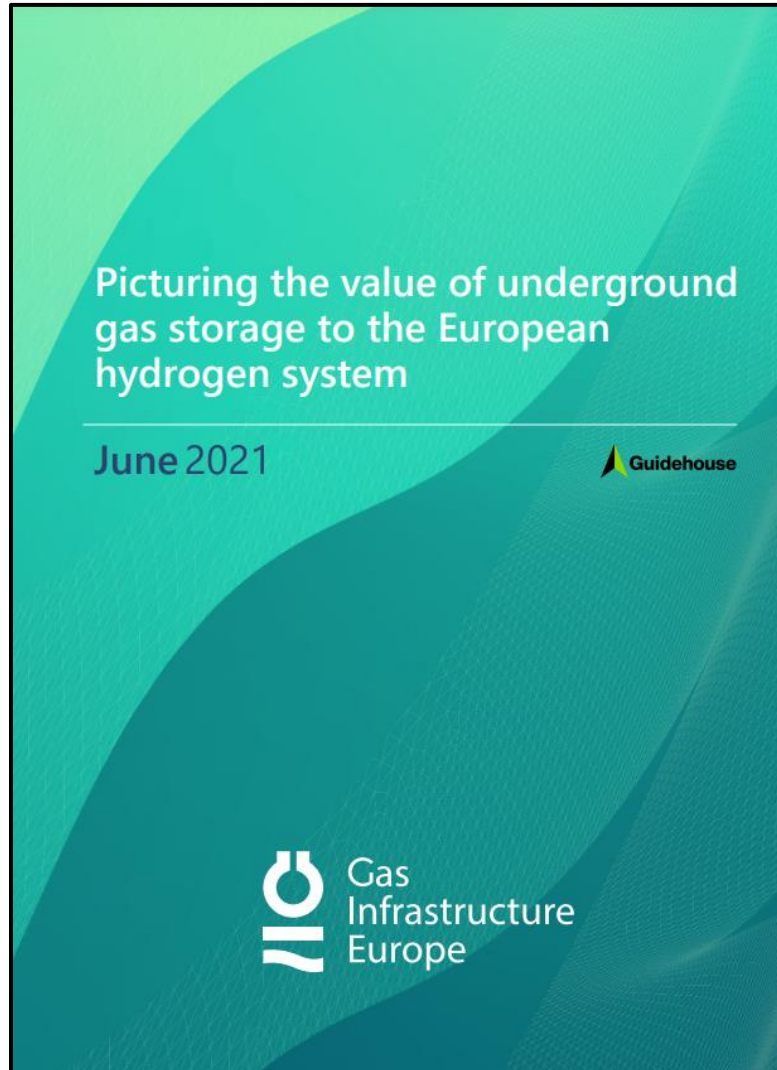
How to re-use gas infrastructure for hydrogen



Main conclusions

- Economic assessment confirmed the **strong potential for cost reduction** involving reuse of pipelines compared to their new build options.
- Between **53% and 82% of cost reduction** can be achieved:
 - around 2 Million EUR/km cost reduction for offshore pipelines
 - Around 1 Million EUR/km for onshore pipelines

The value of underground gas storage to the European hydrogen system



Main conclusions

- Large-scale, underground hydrogen storage is indispensable to the development of the European hydrogen market!
- Need for around **70 TWh of hydrogen storage in 2030**, growing to around **450 TWh of hydrogen storage in 2050**
- To be ready for substantial hydrogen demand and regional pipeline networks by 2030, we need to start on the storage now!

Innovative hydrogen storage projects & studies

announced in the field of underground hydrogen storage



- △ Salt cavern
- Aquifer
- ◇ Depleted field
- ✦ Rock cavern
- Pure hydrogen
- Hydrogen blending



Green Hydrogen @Kinsale

HyStock

Loenhout Hydrogen

Lacq Hydrogen

Cerville Storage

HyGreen Provence

HyPSTER

Gaviota

Cuenca Vasco-Cantábrica

Serrablo

Yela

HyGéo

Carriço

+ HyUSPre Project (consortia)

Hybrit

H2 Pilot Cavern Krummhörn

Green Hydrogen Hub Denmark

SaltHy

Westküste 100

Jemgum Storage

H2. PL Salt Storage - KOS

H2. PL Salt Storage - MOG

Damaślawek

HyCAVmobil

GET H2 Gronau-Epe

H2 @ Epe

Bad Lauchstädt Energy Park

H2 Readiness

Underground Sun Conversion [FlexStore]

Underground Sun Storage

Underground Sun Storage 2030

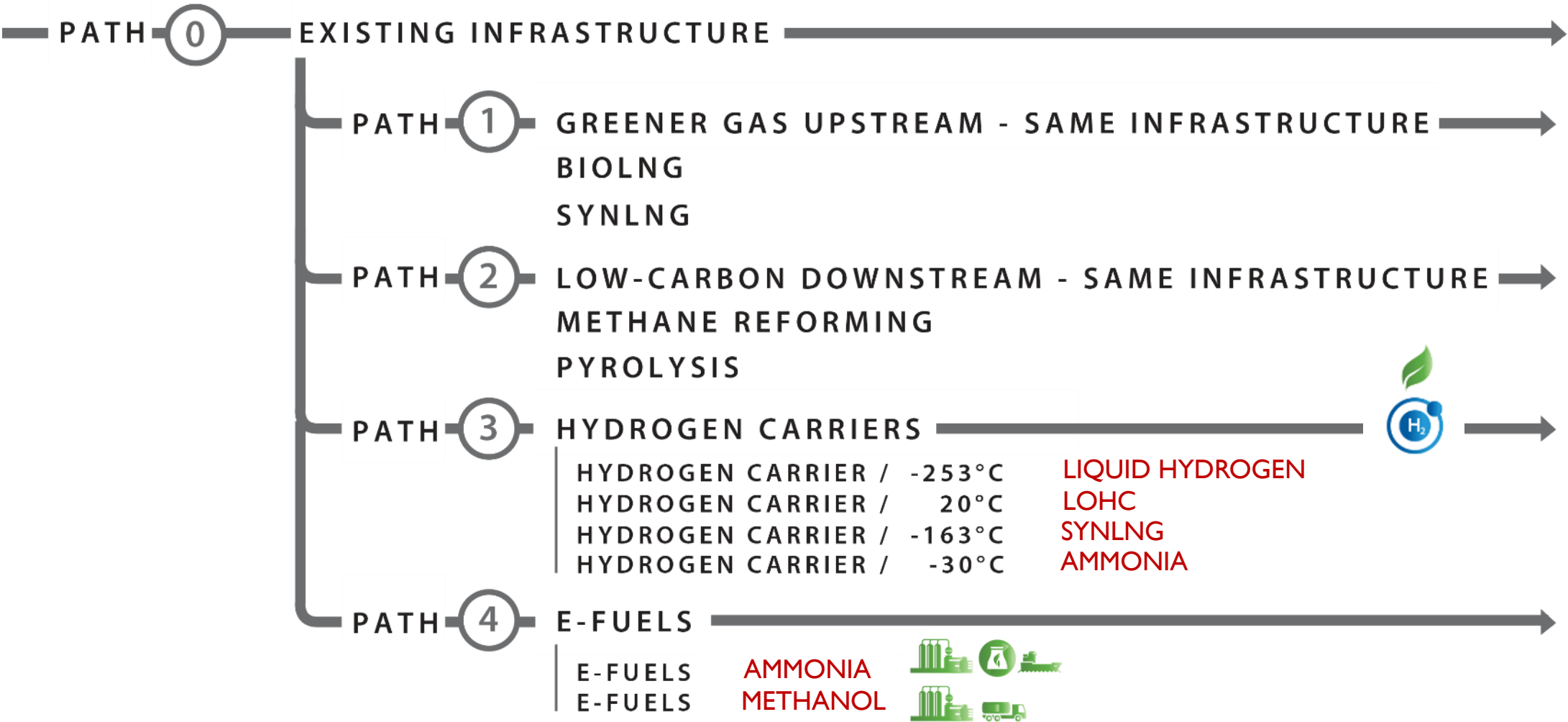
H2I-S

UGS Ptrukša

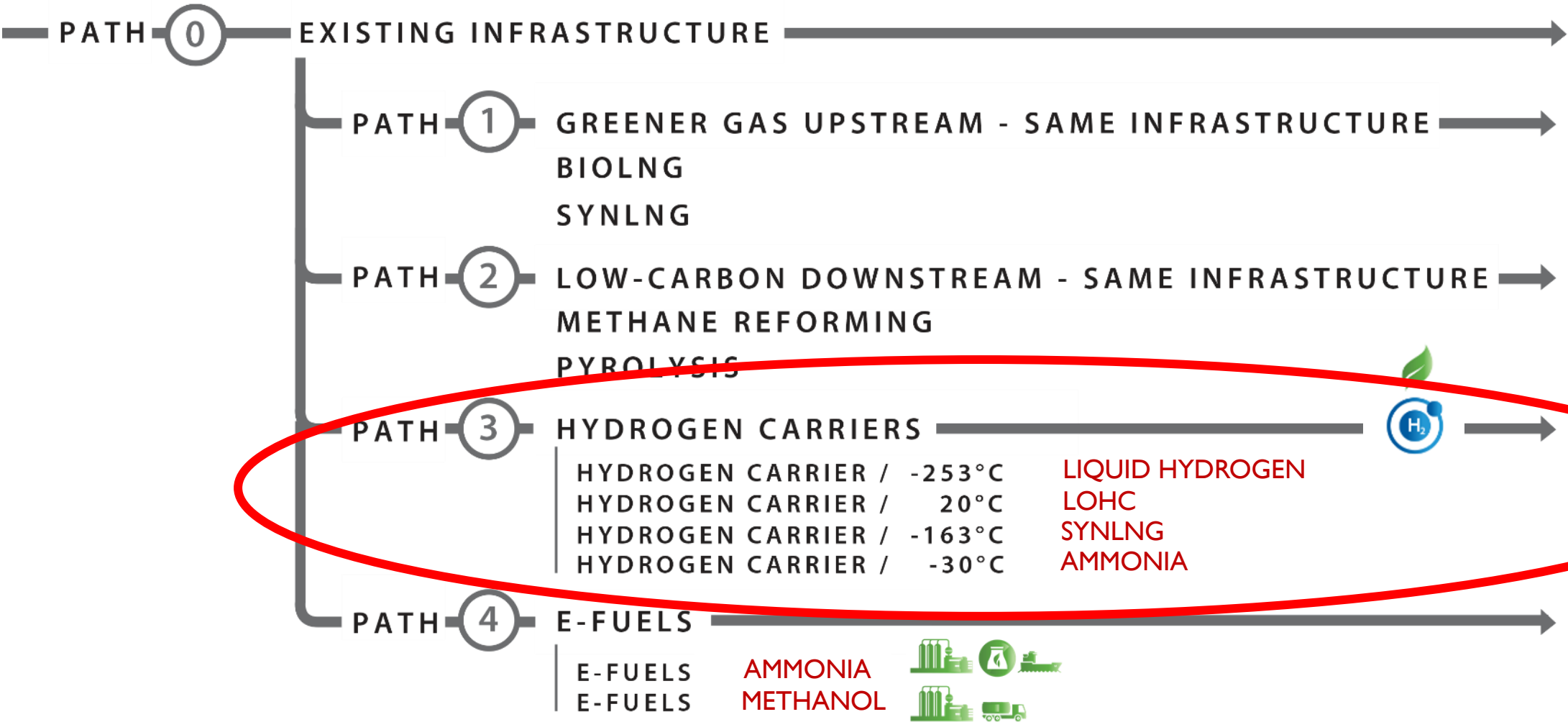
Aquamarine

Storage Hub Italy

Many decarbonisation pathways using existing and upgraded LNG terminals



Many decarbonisation pathways using existing and upgraded LNG terminals





The regulatory framework for hydrogen

Our general asks on how gas infrastructure can accelerate the transition to carbon neutrality



- Legislation should respect different pathways and national starting points
- Exploit synergies between natural gas, biomethane and hydrogen infrastructure
- Enhance sector integration and integrated planning, including hydrogen storage
- System value of hydrogen infrastructure must be adequately remunerated
- Establish collaboration on hydrogen with countries around the world



THANK YOU
For your attention

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