gasunie
crossing borders in energy

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Gasunie lessons based on converting the first CH4 pipeline to H2

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Some context: Gasunie structure and experience with H2 (1/2)

Gasunie structure

- Gasunie infrastructure company (Group company) is ownership unbundled and can be (based on NL legislation) asset-owner of transport, storage and P2G facilities

- The Group is active in:
  - **Transmission**
    - The Netherlands: GTS (Gasunie Transmission Services)
    - Germany: Gasunie Deutschland
    - Interconnectors: BBL, Nord Stream
  - **Storage**
    - EnergyStock Zuidwending
  - **LNG**
    - GATE
    - GLNG (planned)
  - **Hydrogen**
    - Zeeland pipeline
    - Hystock P2G
- In 2018 a GTS owned natural gas pipeline (12 km) was repurposed by Gasunie to transport hydrogen in the South West of the Netherlands (Zeeland) from the Dow Chemical plant to fertiliser producer Yara

Some context: Gasunie structure and experience with H2 (2/2)

Starting point of Gasunie view on H2 regulation

- The Zeeland hydrogen pipeline made it clear that there are regulatory concerns with repurposing: if GTS were to operate the pipeline, strict regulations would have applied to the H2 pipe (regulation such as CAM/CMP, TAR, INC, BAL and aspects of tariff regulation such as benchmarking are not intended for a developing H2 market)

- Gasunie came to view H2 not as just replacing natural gas demand since it will also serve a variety of different customers (existing and new users, different price settings, etc.). In that sense H2 is not similar to gases as defined in art. 1.2 of the EU Gas Directive

- Cross-subsidisation is not allowed (also following: EU Law)

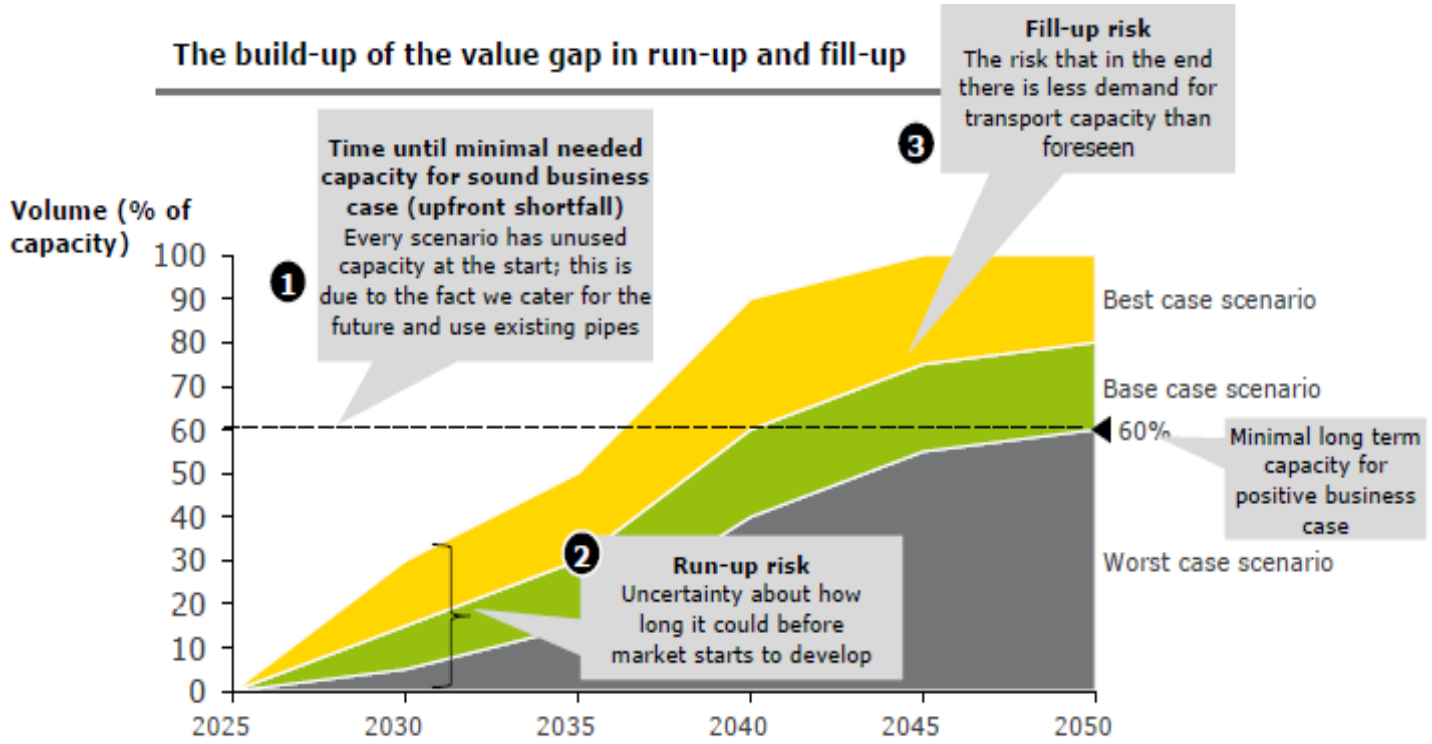
- Hence for the Zeeland pipeline, the repurposed natural gas pipeline was transferred from GTS to Gasunie, keeping the new hydrogen asset separate from the natural gas RAB of GTS. This set-up will also be followed for the backbone on which we expect the first concrete steps in 2021/2022

- The initial H2 network will not be a meshed network as today for CH4. Throughout the EU regional differences are expected when it comes to the types of H2 infrastructure (i.e. meshed networks vs a collection of direct lines)

- To ensure an effective roll-out of H2 infrastructure, the following is needed:
  - A pragmatic regulatory framework which allows for variation per MS/region and room to grow and not be stifled
  - Maximise synergies where possible i.e. operations/maintance

Financing the hydrogen network

- The risk for building the network shouldn't rest solely on the infrastructure operator, otherwise the investments won't happen
- Having early users pay for the network alone is also not an option
- Risk sharing is needed between investors, governments and network users
- Investors require financial support, e.g. subsidies for annual total expenditure or guarantees from the government in relation to capacity risks, for the construction and management of a hydrogen network.
- This requires a certain amount of regulation, give state aid requirements. This example was also followed for the construction of a heath 'backbone' by Gasunie in the Province of South Holland.



- The type of regulation isn't stipulated and can follow different paths: strict rTPA, loose nTPA or the middle ground:

  ⇒ **a bandwidth to allow for flexibility & risk sharing**

  - bandwidth of tariffs forms basis for negotiation
  - standard set of conditions for groups of customers, open access, non-discriminatory

How to ensure fit for purpose regulation

- A gradual approach is needed:
  - the development of hydrogen infrastructure is still in its infancy and its future evolution uncertain
  - Make a clear distinction between the different market stages for the hydrogen market
  - National and regional developments may occur at different speeds: should we not look at how regional initiatives may be more beneficial instead of an EU approach upfront?
- Start with regulation when there is a market (or market failure) and apply tariff regulation when there is a liquid interconnected market (many buyers, many sellers and multiple supply routes).
- Specify the role of infrastructure operators in hydrogen value chain:
  - Transport – increasingly regulated activity in accordance with market maturity
  - Storage – keep options open in EU (conform to current rules) – there is/will be enough competition
  - P2G – separated from the TSO but possible in a separated entity within the infrastructure company. Follow a similar way as currently the storage and LNG activities are structured within Gasunie i.e.:
    - no cross-subsidies between TSO and P2G activities
    - separate accounting between TSO and P2G activities
    - ensure proper firewalls