Baker McKenzie.

Switzerland's hydrogen opportunity

4 July 2022

Agenda

1. Summary of the key drivers underpinning a Swiss Hydrogen Strategy.

2. The Commission's legislative proposal on hydrogen of December 2021 and its implications for Switzerland.

3. Key issues for consideration for Switzerland

Expected Hydrogen Demand

- Switzerland will require low and zero-carbon hydrogen as part of its long-term energy mix; the quantities are likely to be limited, and the ramp-up slower, compared to certain EU countries. However, given the future importance of this market, being an ‘early adopter’ has strong value.

- Whilst it is impossible to predict with any degree of precision, with the EU ‘Green Deal’, the EU will need a lot of low and zero-carbon hydrogen. Assuming that the EU meets just 15% of its energy demand from H2 in 2050, it will need 76 Mt by 2050 – equivalent to 234 bcm of natural gas in energy terms. Most of this will need to be imported (2018 Russian gas imports were ~150 bcm.

- The EU Hydrogen Strategy is being translated into legislation, and considerable momentum now exists across the EU. Member States are already investing, such as Germany and France with €7 billion each. The European Recovery Plan (ERP) will kick-start funding in electrolysers and the hydrogen grid over the next 6 years. The RePowerEU strategy will ‘turbocharge’ this.

- There is increasing consensus that the EU will not be able to produce a significant share of the green hydrogen that it will need in the medium-to-long term domestically (both in terms of physical capacity and cost). Short-term supply growth (2022-2026(?)) will, however, be (mostly) produced in the EU, with imports from 2025 onwards.

- There is an increasing understanding, therefore, that the EU will need to import (most) of its needs of green hydrogen in the medium- to long-term. Germany is already investing (€2 billion) in external supplies.

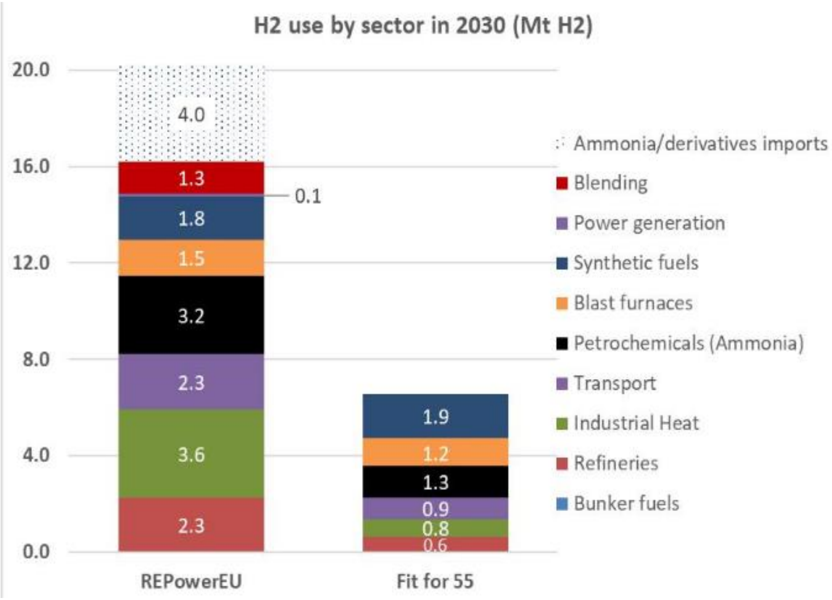
- REPowerEU sets a target of 10 Mt of domestic renewable hydrogen production and 10 Mt of renewable hydrogen imports by 2030. A joint EU-level purchasing mechanism, based on the ‘German model’ is under preparation.

1. Summary of key drivers

Enhanced renewable hydrogen targets

- **10 Mt** of domestic renewable hydrogen production by 2030.This would require **65 GW** of installed electrolyser capacity in the EU.
- 20 million tons of hydrogen is equivalent to 667 TWh, or about 17.6% of the energy available from EU natural gas use in 2020 in energy terms.
- Increased financing at EU and national level; €3 Bn in RePowerEU ETS Innovation facility.
- IPCEI funds under the EU Recovery Plan.
- Member States now committing important (Recovery Fund) spending for the hydrogen grid.

Domestic consumption by sector in 2030



Expected Hydrogen Transit

- The most logical and competitive source of competitive green hydrogen for Europe is via pipeline from North Africa. Two import routes from Northern Africa to North-West Europe, (i) via Spain or (ii) via Italy.
  - Spain has capacity constraints to France (EU) and challenges exist to increase such capacity.
  - From Italy to Central Western Europe (main EU demand centre), the Swiss route is shorter and more logical.
  - The ‘Hydrogen Backbone’, developed by European gas infrastructure operators, however, envisages that Austria already integrated in the Backbone in 2035, Switzerland post-2040.
- Assuming, therefore, that:
  i. the EU will need to meet a significant part of its medium- to long-term energy needs from green hydrogen;
  ii. a significant part of this will come from North Africa; and
  iii. the most cost-effective import and transit route are used;

then the inevitable conclusion is that **very significant quantities of renewable hydrogen will need to transit via Switzerland**. There are important uncertainties concerning the exact quantities and the timing of this transit, but the trend/opportunity is very clear.

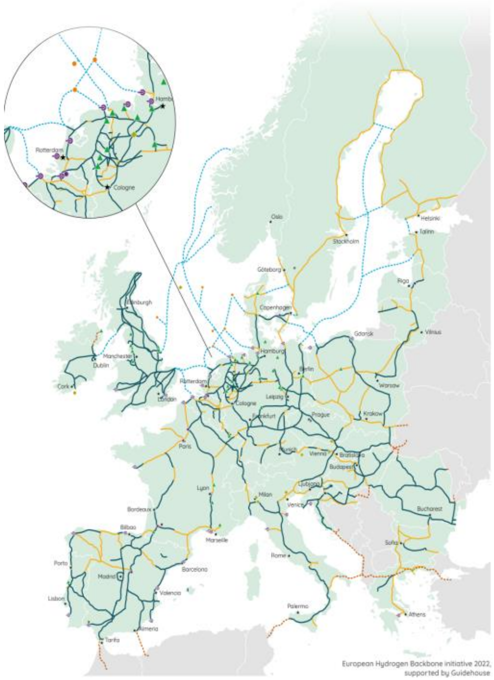
1. Summary of key drivers

The ‘European Hydrogen Backbone’

A hydrogen infrastructure development plan originating from 31 infrastructure companies in 28 countries

2030 – Emerging regional networks

2040 – Mature backbone



1. Summary of key drivers

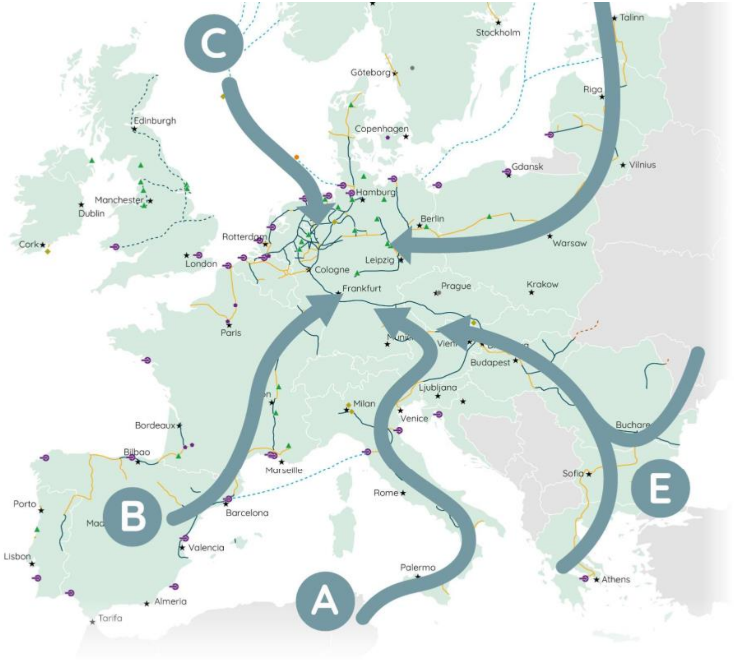
The Risk that Switzerland is ‘by-passed as a transit route due to delay is real

On June 7th the European Hydrogen Group (TSOs…) presented the new ‘import’ strategy with 5 ‘hydrogen supply corridors’ by 2030 to meet the 10Mt import RePowerEU target

The five hydrogen supply corridors are:

- Corridor A: North Africa & Southern Europe
- Corridor B: Southwest Europe & North Africa
- Corridor C: North Sea
- Corridor D: Nordic and Baltic regions
- Corridor E: East and SouthEast Europe

These five corridors span across both domestic and import supply markets, consistent with the three import corridors identified by the REPowerEU plan

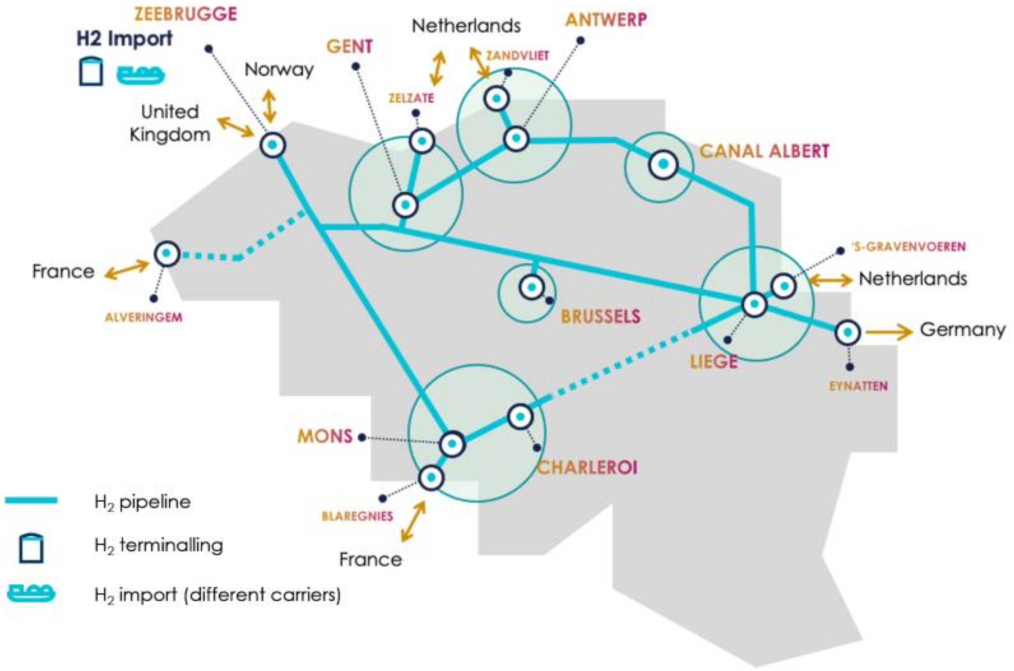


Fluxys' Hydrogen grid Development

By 2030 28.000 km of H2-grid

By 2040 53.000 km of H2-grid

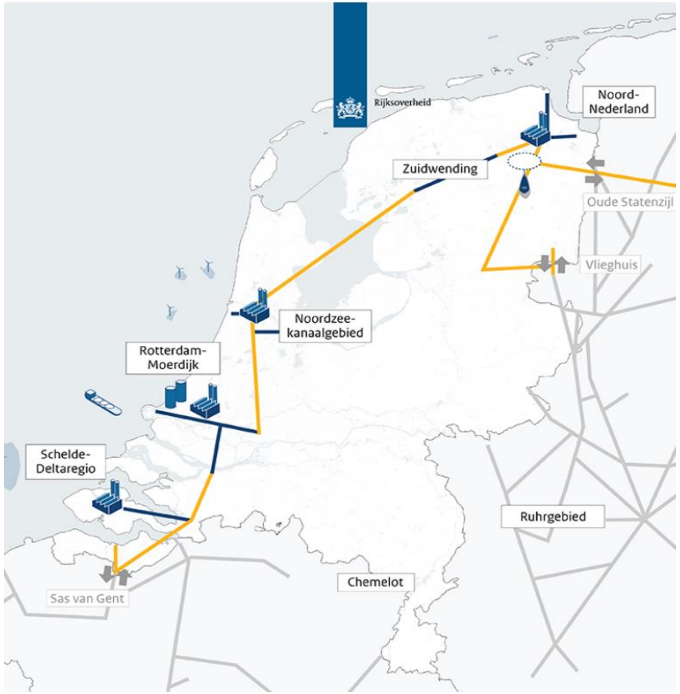
60% repurposing and 40% new pipes



1. Summary of key drivers

The Dutch H2 Grid roll-out (Government Decision of 29 June 2022

2025-2026



2030

2

The Commission’s legislative proposal on hydrogen of December 2021 and its implications for Switzerland.

2. The Commission’s Hydrogen Proposals: overview

- Strong unbundling requirements, based on the Gas legislation
- Regulated TPA to the network post 2030; NRA’s to supervise
- Obligation to accept 5% hydrogen blending into the natural gas network
- Tariff reductions for injecting hydrogen into gas grid and storage
- Mechanisms to certify that hydrogen achieves a 70% GHG saving; also applies to imports
- Expect agreement on proposals +/- end 2023, applied in national law end 2024.

2. The Commission's Hydrogen Proposals

The 'hydrogen and decarbonised gas' package: Interconnectors.

- Article 49 of the Gas Directive reform proposal requires (our emphasis):

> *"**Hydrogen interconnectors between Member States and third countries shall be subject to the rules applicable to hydrogen networks as set out in this Directive** and in [the proposed Gas Regulation]*."
>
> To achieve this: "*The Union shall, for each hydrogen interconnector, conclude prior to its operation an **intergovernmental agreement with the connected third country**, or third countries**, setting out the operating rules for the hydrogen interconnector** concerned where the Commission has determined that such an agreement is necessary*".

- Although the Gas Directive reform proposal does not explicitly provide that, without an IGA, a hydrogen interconnector with Switzerland would not be allowed to operate, previous experience with similar EU laws (such as with the Balancing Grid Code) show that the Commission will most likely (try to) use this provision to oblige EU NRAs to exclude imports from countries where no parallel regulatory approach exists.

3

Key issues for consideration for Switzerland

3. Key issues for consideration for Switzerland

Internally: within Switzerland

- **A “Swiss Hydrogen Strategy”:**
  - ➢ in full consultation and collaboration with stakeholders, including Swiss regional players;
  - ➢ covering both domestic and transit aspects; and
  - ➢ building on existing studies regarding hydrogen demand and production in relevant decarbonisation scenario.
- **In this “Swiss Hydrogen Strategy”:**
  - ➢ Switzerland could commit to be playing a central role in the wider European hydrogen market.
  - ➢ In particular, it could commit to facilitating the deployment of the clean hydrogen network via IGA(s) safeguarding transit.
  - ➢ It may consider the role of existing Swiss transit pipelines within an emerging Swiss hydrogen network, in particular as a hydrogen network operator for transit.

Swiss national hydrogen demand vs. transit

- Switzerland will need hydrogen for its own industrial or energy-related uses, but initially limited quantities.
- However, a late coupling to the EU H2 market can have negative effects for the competitive position of Swiss industry, relevant to the production of CO2 neutral products.
- Given expected EU uses, the transit of hydrogen between the North and South of Europe will be the main challenge and opportunity for Switzerland.
- A key question will be when/how to repurpose existing gas transit lines:
  - Too quickly, this could have negative effects as it would disconnect Switzerland from the EU natural gas market, potentially (i) causing increased costs for industry and consumers, and (ii) losing gas transit revenues (in a declining (but still important) EU gas market)
  - Too slowly, risk losing ‘first mover advantage’ on transit of hydrogen from N.Africa to C.W.Europe
  - Potential for blending/de-blending hydrogen on the existing gas transit pipeline as an interim solution merits study.

3. Key issues for consideration for Switzerland

Externally: towards the Commission/EU Member States

- **Regarding the favoured transit route:** It is important for Switzerland to 'occupy the territory' and get the timing right (which is impossible to define today):
  - Spain also has ambitions to be the main import route from North Africa to the rest of the EU.
  - Although longer and probably less cost-effective, the Austrian transit route will also link Italy to Germany and could compete with the Swiss transit route.

  It is important to prevent foreclosure via EU funding (e.g. via CEF).
- **More generally:**
  - ➢ The Swiss Government may wish to seek to become involved in discussions on the future European hydrogen grid, and for example, should be a member of any 'regional policy grouping' relating to hydrogen. SFOE may seek to participate in ACER discussions at an early stage, as it is important to engage early to prevent initial approaches from being developed that would be unfavourable to Switzerland.
  - ➢ Switzerland may wish to consider joint investment with EU Member States in electrolysis production in Africa.

3. What are the key issues for Switzerland to consider?

‘Target’ Regulatory Model for Hydrogen Transit (1)

- **Regarding the grid financing model.**
  - The grid will be challenging to finance in its early years, as it will need to be built far larger than initial transit demand.
  - Thus, the hydrogen network, in particular transit pipelines, will be difficult to finance without either (i) public subsidies, (ii) acceptance of long-term debt (and risks), or (iii) cross-subsidies/mutualisation.
  - In the EU, Member States are moving towards giving direct grants/subsidies for hydrogen networks (e.g. Belgium, Germany, Netherlands). Whilst mutualisation between hydrogen and natural gas is a potentially legally compliant option, no EU country has signalled intent to go down this route. EU TSOs argue that pure debt financing is not sustainable in early years (given that separate companies/RABs will have to be established).

Glossar/Abkürzungen

ACER: (EU) Agency for the Cooperation of Energy Regulators; europäische Agentur für die Zusammenarbeit der Energieregulierungsbehörden

Bcm: Billion cubic meter; Milliarde Kubikmeter

CEF: Connecting Europe Facility; EU-Fonds zur Förderung von Wachstum, Beschäftigung und Wettbewerb durch gezielte Infrastrukturinvestitionen

GHG: Green House Gas; Treibhausgas

IGA: Intergovernmental Agreement; zwischenstaatliches Abkommen

IPCEI: Infrastructure Projects of Common European Interest; Infrastrukturprojekte von gemeinsamen europäischem Interesse

IRENA: International Renewable Energy Agency; Internationale Agentur für erneuerbare Energien

NRA: National Regulatory Authority; nationaler Regulator

RAB: Regulated Asset Base; regulierte Vermögensbasis

R&D: Research & Development; Forschung und Entwicklung

RFNBO: Renewable Fuels of Non-Biological Origin; erneuerbare Treibstoffe nicht-erneuerbaren Ursprungs

rTPA: regulated Third Party Agreement; reguliertes Drittzugangsregime

SFOE: Swiss Federal Office of Energy; Bundesamt für Energie (BFE)

TSO: Transmission System Operator; Gas-Übertragungsnetzbetreiber

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