



**IBA Biennial Conference of the Section on
Energy, Environment, Natural Resources
and Infrastructure Law (SEERIL) 2022**

Renewable Fuels

May 17, 2022

Sarah A. W. Fitts

Moderator for “Renewable Fuels” Session

IBA Power Law Committee Co-Chair



Sarah advises clients on private mergers and acquisitions, development projects, joint ventures, financings, sustainable investing, environmental, social, and governance (ESG), and restructurings, with a focus on the energy and infrastructure industries. Sarah represents US and global clients, including Japanese companies, doing business in the United States and around the world. Her clients include power developers, investors, sovereign wealth funds, and private equity across a broad range of industries.

About ArentFox Schiff

We are an internationally recognized in core industries where business and the law intersect. With more than 600 lawyers and policy professionals, the firm serves as a destination for an international roster of corporations, governments, private individuals, and trade associations.



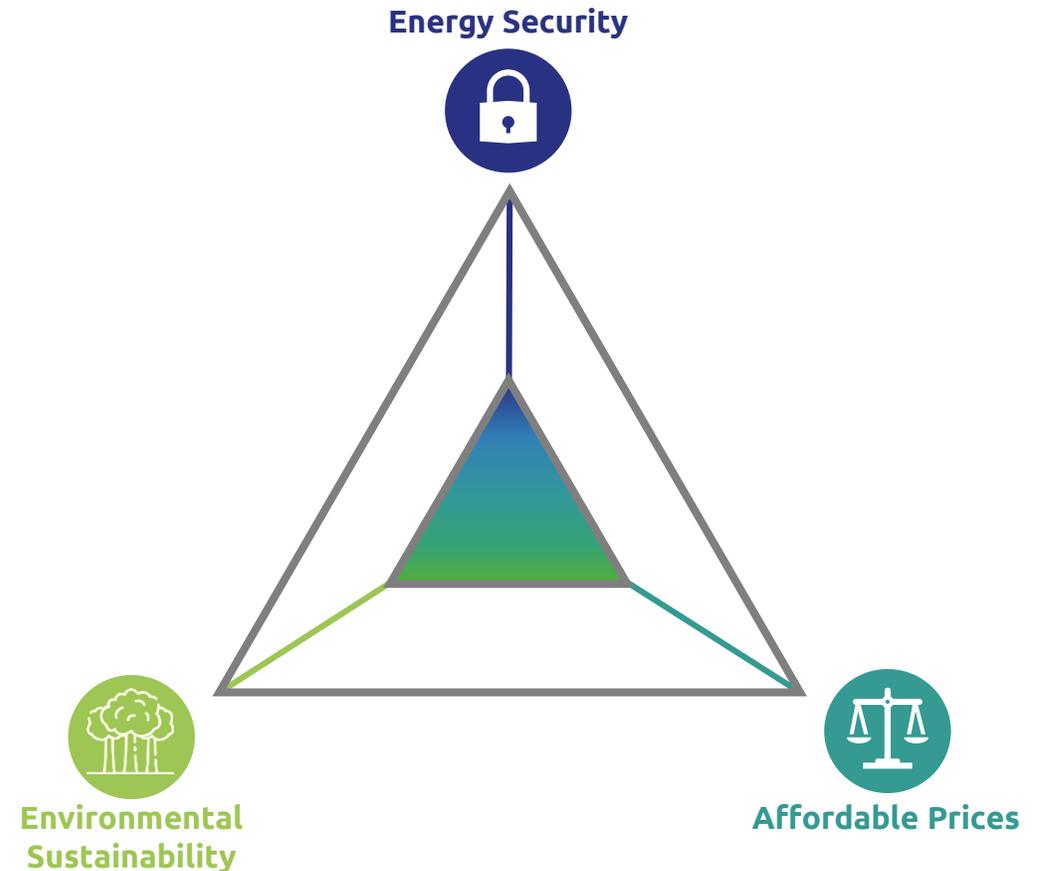
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Snam's commitment: solving the Energy Trilemma

Patrizia Rutigliano
17th May 2022

The Energy Trilemma

The Energy Trilemma refers to finding a balance between **energy security**, **environmental sustainability**, and **affordable prices** in how we access and use energy in our daily lives.



Today's context: Ukraine and the Energy Crisis



FINANCIAL TIMES
EU to step up push for clean power as Ukraine conflict escalates

FINANCIAL TIMES

Russian forces descend on Kyiv

FINANCIAL TIMES

Europe must end its Russian energy habit

The Washington Post

Europe eyes strategy to end Russian energy dependence

The Russian invasion has led to sharp rises pressures. This has intensified fears that the fra
By Derek Brower,

New energy shock hits global economy

Le Monde

Sign In

OPINION

War in Ukraine: Ending the use of Russian gas

NEWS

Home | War in Ukraine | Coronavirus | Climate | Video | World | UK | Business | Tech | Science | Stories
Business | Market Data | New Economy | New Tech Economy | Companies | Entrepreneurship | Technology of Busine
Global Car Industry | Business of Sport

Ukraine war: Should we be worried about a gas supply crisis?



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EU Legislation on Energy: RepowerEU

An unprecedented frequency of Ministerial meetings



EU Communication «RePowerEU» March 8

- Measures to reduce dependence on Russia including H2 ready infrastructures and interconnections
- EU Platform for joint procurement of LNG for strategic stocks and Mediterranean dialogue for green H2
- New EU target for biomethane development of 35bcm per year by 2030 and higher ambition on H2
- Anticipates new storage obligations – EU Regulation of March 23 under discussion

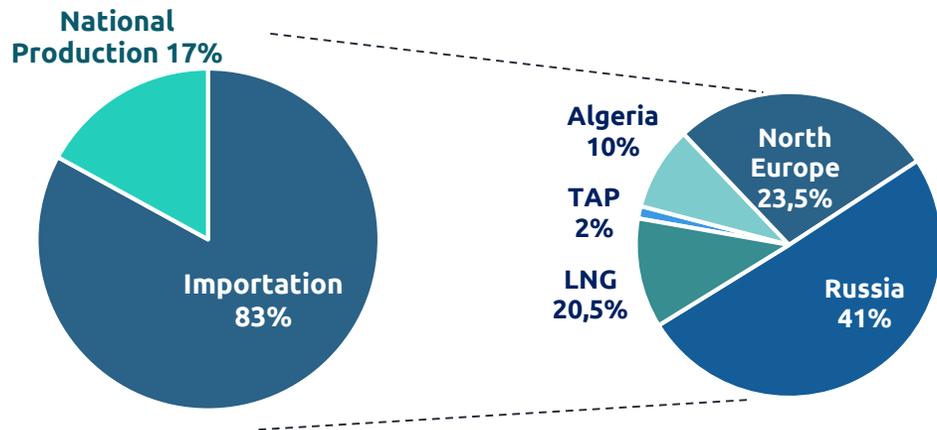
RePowerEU Plan May

- Guidance for governments on the review of RRSPs / RRFs
- Scaling up renewable energy: Biomethane Plan, Solar Europe Plan, faster permitting procedures
- New list of infrastructure 'priority projects' for diversification and security
- Possible reflections on deeper market design reforms to decouple electricity and gas prices

Gas supplies to Europe and Italy

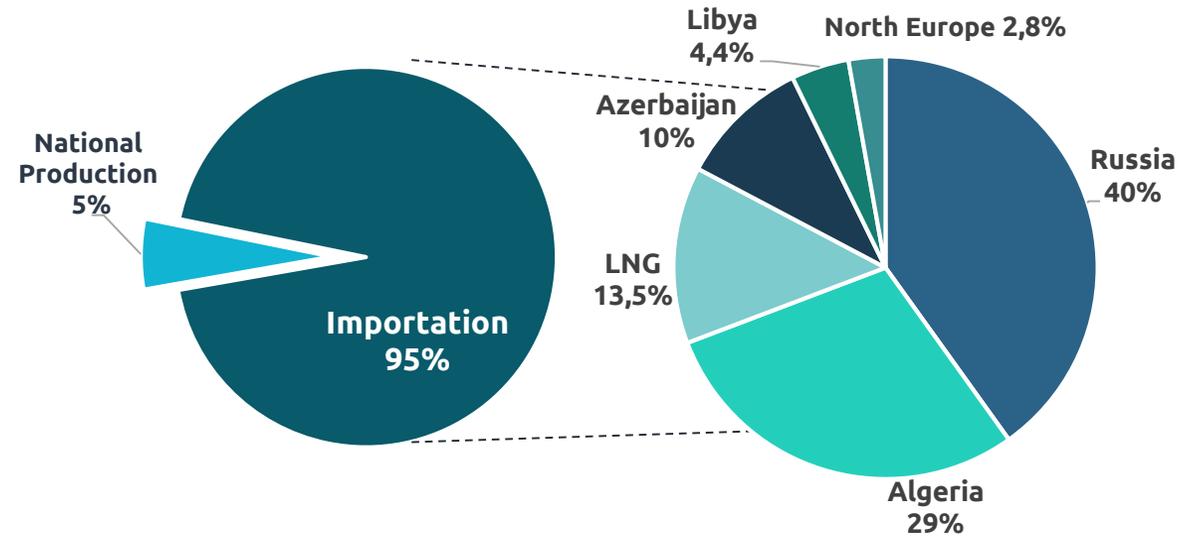
Gas demand strongly dependent on imports...

Gas supply to Europe



Demand 2021 : ~ 550 bcm

Gas supply to Italy



Demand 2021 : ~ 76 bcm

... and in particular from Russia

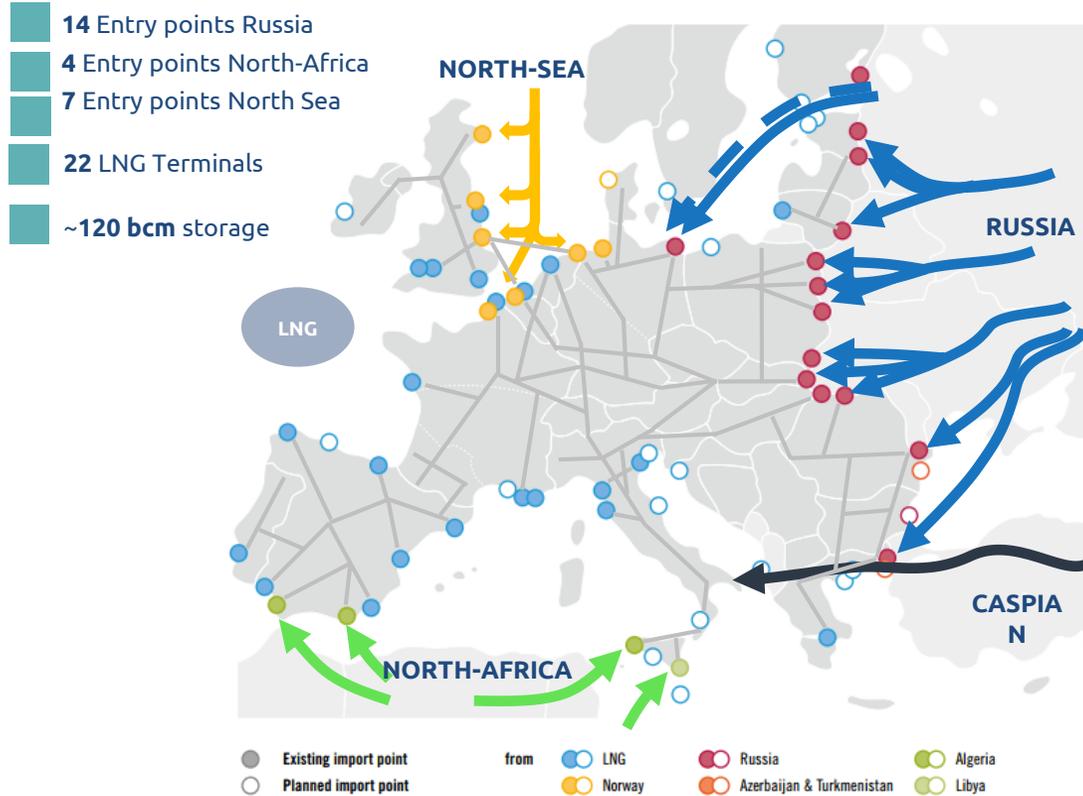


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Sources: Europe - Eurostat quarterly report on gas markets
Italy - MITE Annual report - Snam data

Gas supplies to Europe and Italy

European Infrastructure



Source: *ENTSOG TYNDP 2020 – Existing and planned import routes by source*
GIE – Storage map
Snam elaboration

Italian Infrastructure



Snam is one of the main global energy infrastructure companies with the purpose of being enabler of the energy transition

30.3%
cdp CDP Reti



69.7%
Free float
~80K investors

Snam started a re-positioning process on new businesses focused on ecological transition



Key figures

24 €bn
RAB + affiliates ('21)

31 €bn
Enterprise Value

1%
Debt cost

1,218 €m
Net Profit Adj. ('21)

~ 17 €bn
Market Cap

BBB+
Rating



International footprint

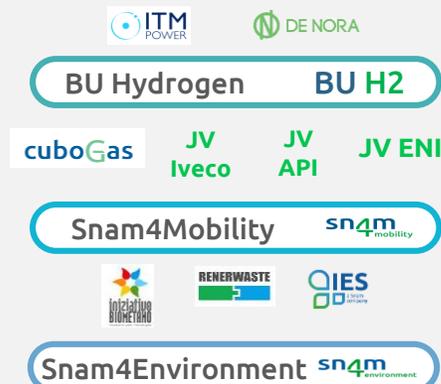


Natural gas¹

~32,767 km
Transport

~18 bcm capacity
Storage

~15,25 bcm/y capacity
Regasification



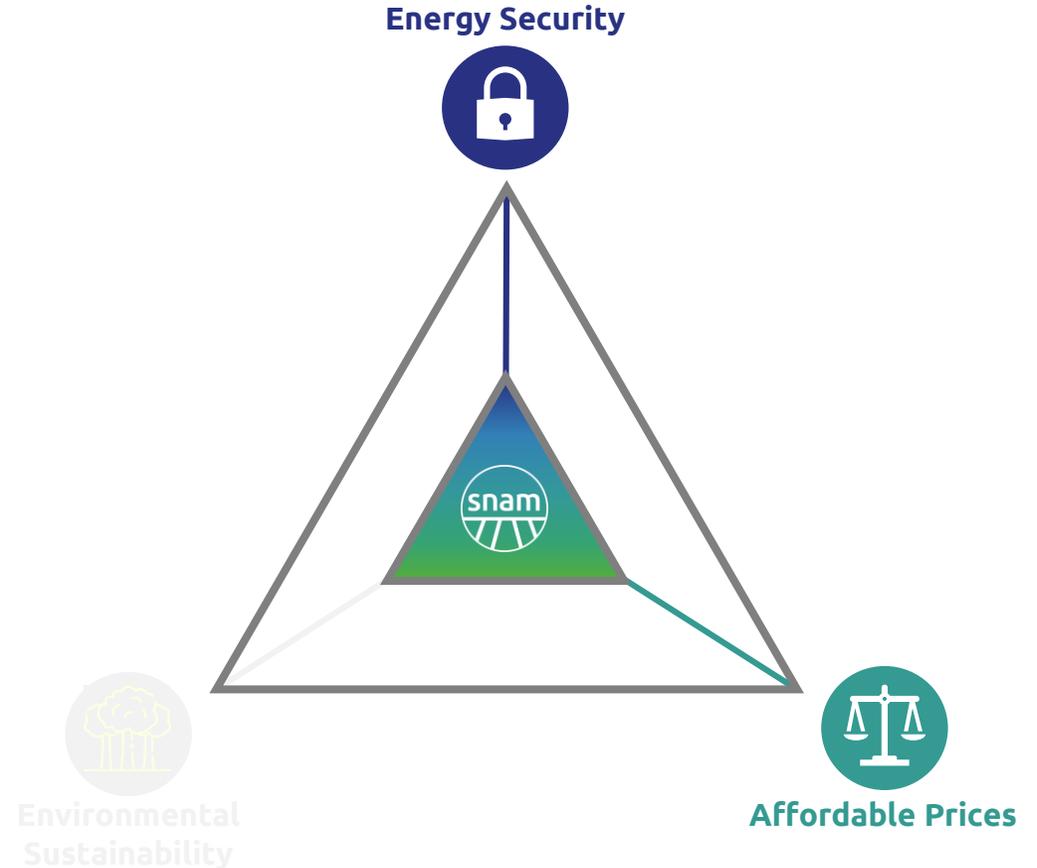
¹ Italy only (not counting associates)



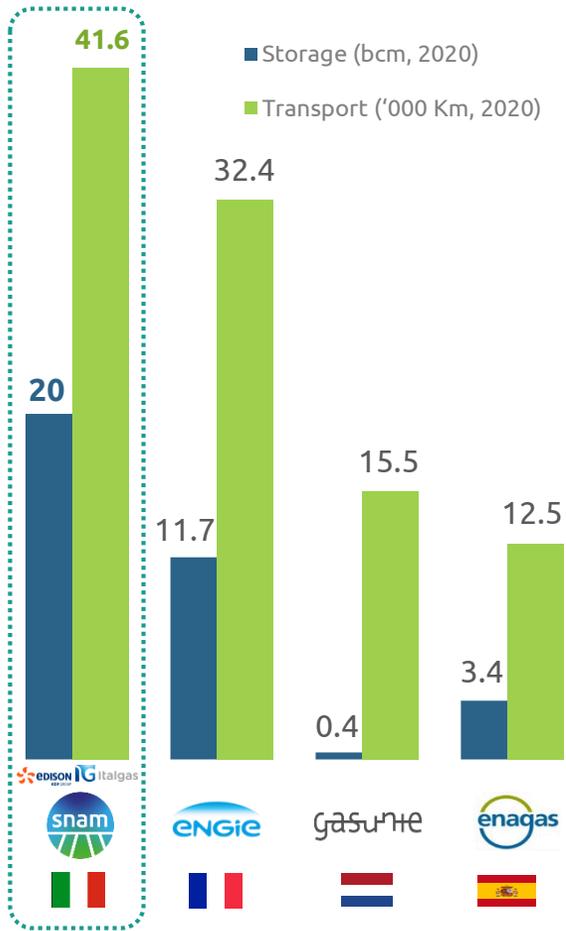
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Energy Security: What is Snam doing?

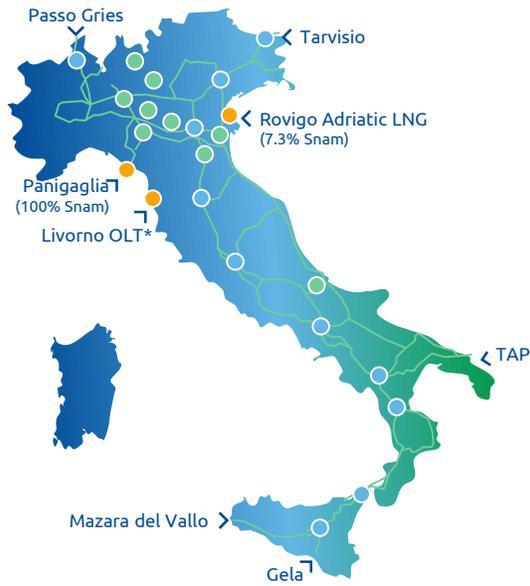
Snam is committed to ensuring **energy security**, through the maximisation of its capacity in **gas storage, regassification & transport**.



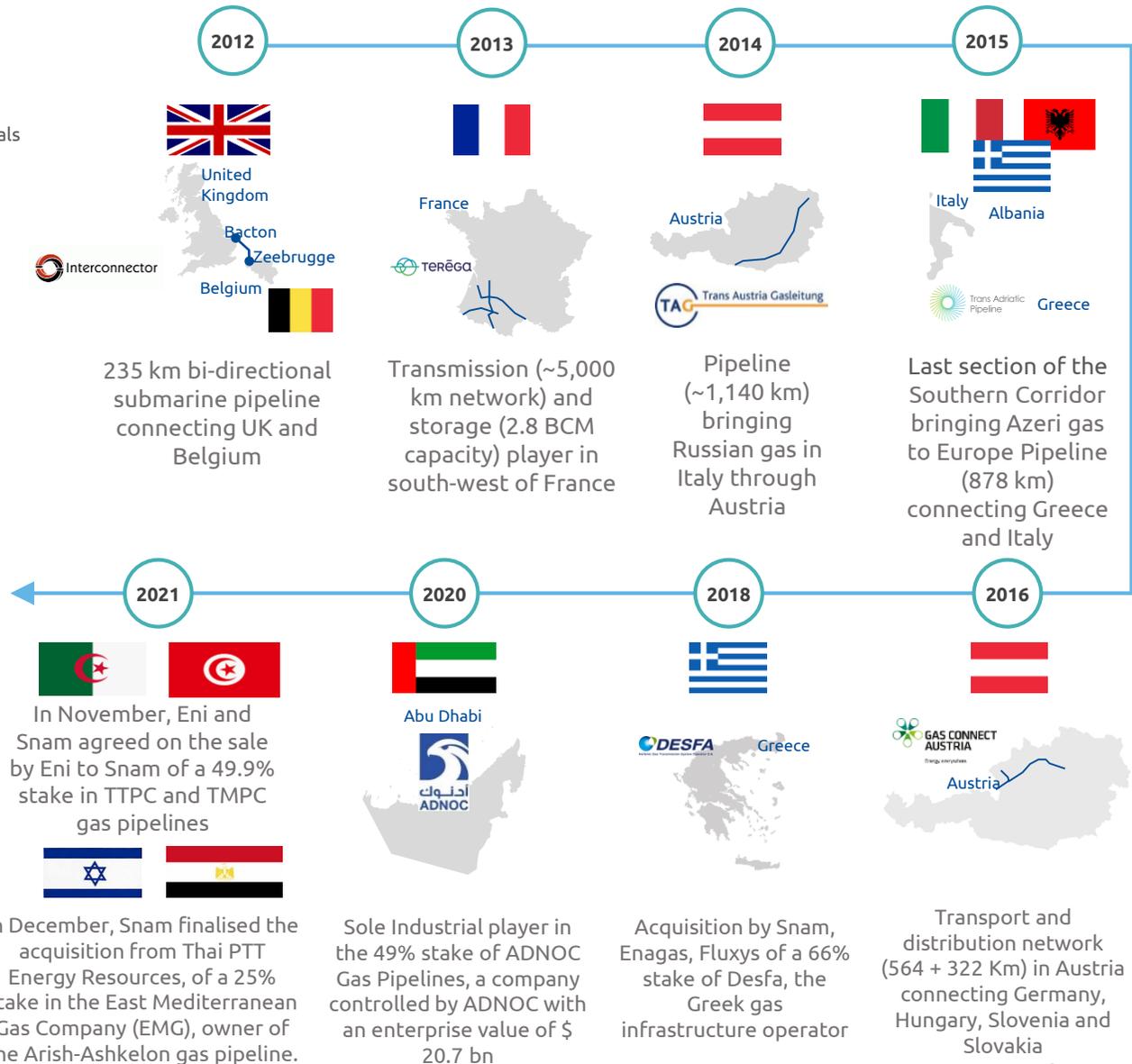
Leader in natural gas infrastructure



- National pipeline network
- Compression stations
- Entry points
- Storage sites
- Regasification terminals



3/3 Our regasification terminals in Italy



Snam's activities for Energy Security

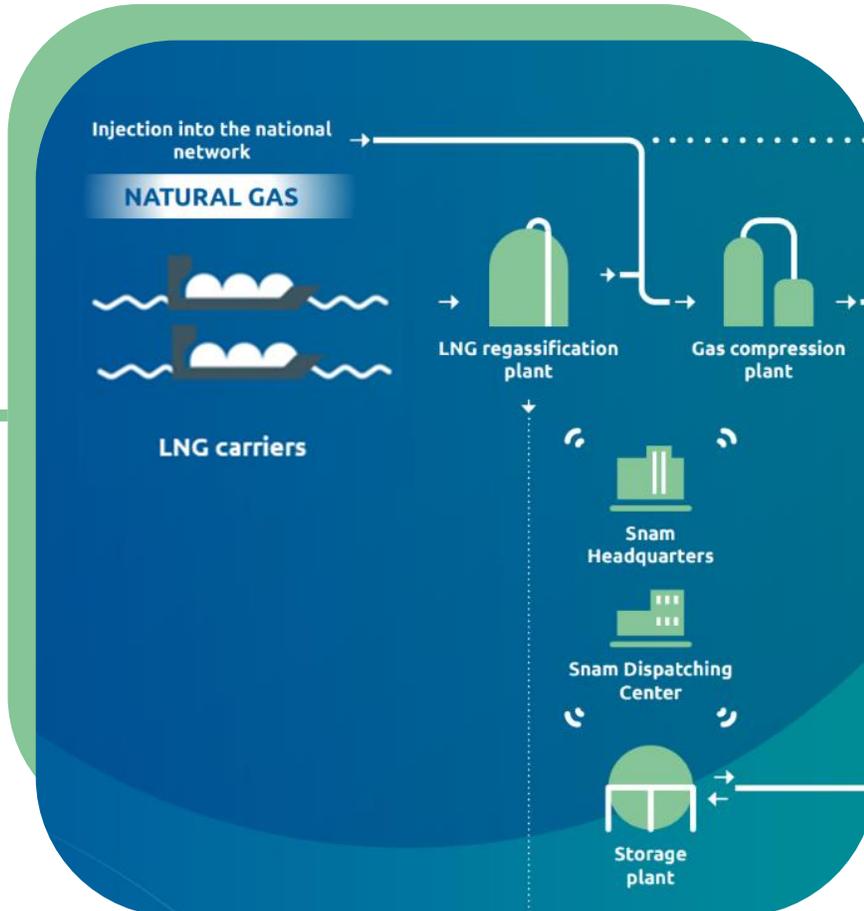
Regasification

Snam's total **Regasification Capacity**: 15.25 bcm / year.

Snam contributes to the Italian regasification capacity via **three plants** in the Country:

- **Adriatic LNG**, located in Rovigo: 8 bcm;
- **Panigaglia Regasification Plant**, located in Portovenere, La Spezia: 3.5 bcm;
- **OLT Offshore LNG Toscana**: 3.75 bcm.

Snam is also currently supporting the Italian government in the **acquisition of 2 floating storage and regasification units (FSRU)**.



Storage

- Italy is the **second largest country in the EU** in terms of capacity after Germany: we have **9 storage facilities** in operation in Italy today which allow the **storage of about 14,000 bcm of gas**.
- Snam is the **leading European operator** with a **total storage capacity of about 18 bcm**, accounting for about **16% of total EU capacity, 3.4% of global capacity and more than 90% of the Italian market**.
- Under the Repower EU, the Commission has proposed new obligations for EU countries to ensure that the storage infrastructures in their territories are **filled up to at least 90% of their capacity by 1st November each year, and to 80% this year.** (To be reviewed in RepowerEU Plan)
- Thanks in part to Snam's injections, **current storage fill levels in Italy (about 43.6%*) are above the European average (about 39.5%*).**

**updated to 14th may 2022*



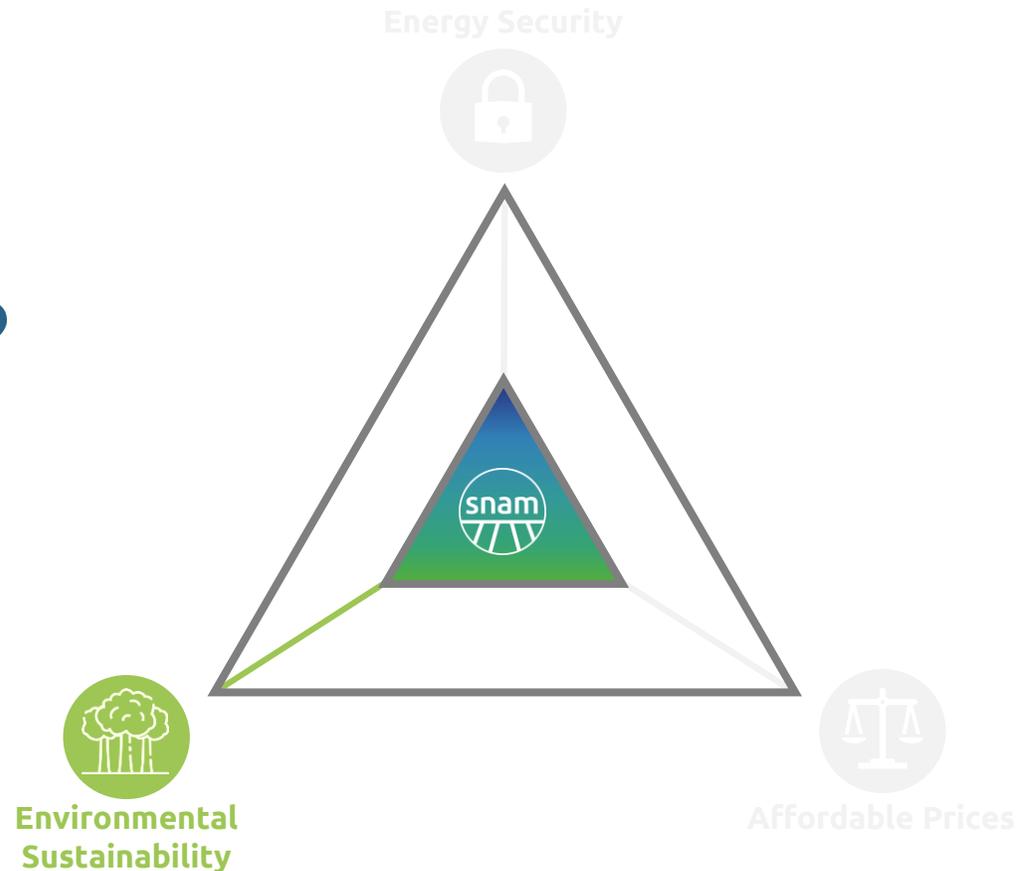
Transport Network

- Italy is the **most diversified country in the world** with **6 entry points via pipeline and 3 LNG terminals**. It is connected to the Southern Gas corridor via **TAP – Trans Adriatic Pipeline**.
- Snam has a **network of 32,767 km in Italy (41,000 km worldwide)** to transport gas to the local distribution networks, to the regional network's redelivery points or to large final customers (thermoelectric power plants or industrial plants).



Energy Transition: What is Snam doing?

Snam is committed to being enabler of the **Energy Transition**, a purpose that has also been included in its bylaws.



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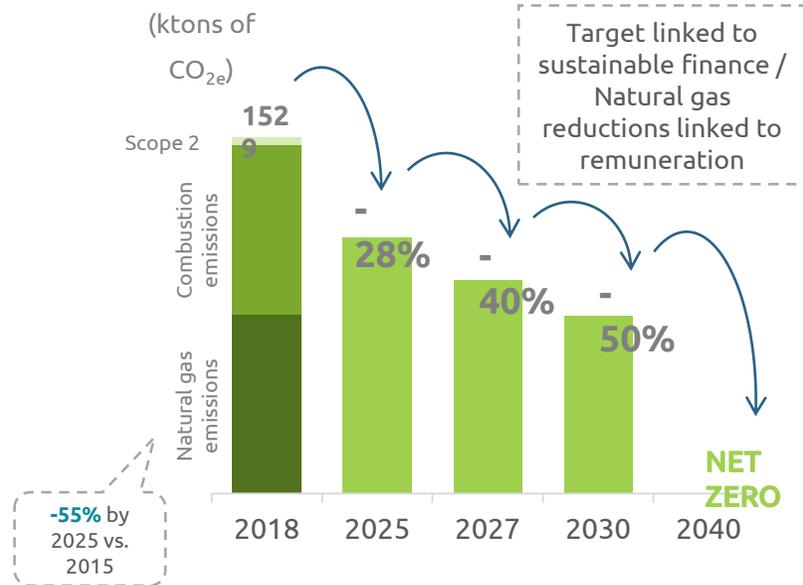
Net Zero strategy - targets and actions

All our targets are in line with the scenario to contain the temperature rise within **1.5 °C** and have been developed according to the generic **SBTi methodology**

SNAM FOR DECARBONIZATION OF THE COUNTRY

- Investments to reduce carbon footprint **included in 2021-2030 capex plan**
- **10%** of top management **LT remuneration** based on methane emission targets
- **New sustainable finance framework** linked to CO2e targets

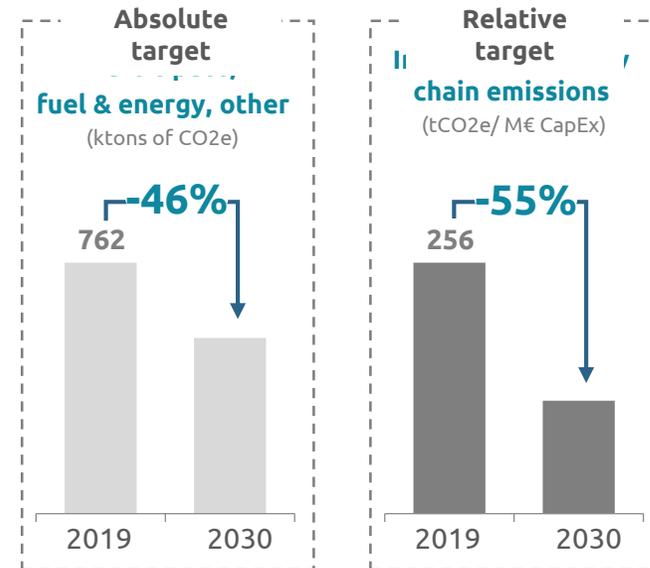
Scope 1 & 2 emissions



Our lines of actions:

- **Dual fuel** installation and implementation of the **LDAR program***
- Development and use of green gases
- Involvement of Snam people through innovation challenges (**Centrale delle Idee**)
- Reduction of emissions from **buildings** (green energy) and methanisation of the **company fleet**

Scope 3 emissions



Main activities:

- Initiatives with **associates companies** (workshops, meetings, target definition)
- Involvement of **suppliers** (inclusion of decarbonisation criteria in tenders, CDP Supply Chain, development of joint projects)
- Initiatives to reduce **other emission categories** (e.g. smart working)

- Strengthen Snam's role as enabler of the system's decarbonisation
- Green gases development
- Collaboration with organizations and institutions



Forestation



Renewable Fuels: Snam's green energy projects

2021-2025 Plan

Investments of 8.1 billion euros for hydrogen-ready infrastructure and green energy projects. These include:

BU H2

Hydrogen

Well-established presence thanks to staffed business unit and partnerships along the value chain

- Pipeline of projects leveraging on public funding in mobility and hard-to-abate sectors
- R&D initiatives and selected venture capital investments

Hyaccelerator
powered by snam



HYDROGEN

c. **€250m**
of investments 2021-25, assuming
ca **€100m** grants

sn4m
environment

sn4m
mobility

Biomethane

Expand leveraging on platforms in urban and agricultural feedstock

- **~118 MW** of installed capacity target (2x previous plan)
- Low risk business model with high visibility and long term incentives

Complete CNG footprint and LNG supply for mobility



BIOMETHANE

c. **€850m**
of investments 2021-25
assuming ca **€100m**
biomethane grants

o/w €100m mobility
infrastructure

renovit

Energy efficiency

Created platform to serve key segments:

- Residential: Pipeline supported by fiscal incentive scheme (Ecobonus 110%)
- Industrial: Ca **90MW** targeted installations of distributed energy systems (vs ~60 MW previous plan)
- Public administration: Public tenders and Private Public Partnerships



ENERGY
EFFICIENCY

c. **€230m**
of investments
2021-25



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Snam's work on the PNRR

During the last year Snam has coordinated the supervision and monitoring of the issues of interest to the company during the construction phase of the PNRR by the Italian Government.



Hydrogen Valleys

Goal: creation of H2 valleys (H2 production, transport and end uses)



Hard to abate

Goal: Production and use of hydrogen in manufacturing processes in industries where electrification is less economically viable or difficult to implement.



Energy Efficiency

Goal: Increase energy efficiency of public and private housing stock



Hydrogen in rail transport

Objective: implementation of hydrogen refueling stations on railway lines



Electrolysers production Italian hydrogen supply chain development

Objective: construction of the first (scalable) plant for the production of electrolysis systems, integrated upstream and downstream with a national supply chain concept leveraging Italian SMEs



Port Developments

Objective: decarbonisation of the port sector through various initiatives (e.g. cold ironing)



Hydrogen refueling stations network

Objective: realization of hydrogen refueling stations for road mobility



Hydrogen Research

Objective: R&D on key hydrogen applications: research projects, startup incubation, industrial testing



Biomethane

Objective: strategic biomethane development for the achievement of European decarbonisation targets.

Incentive system for production plants under review.



Biomethane

M2C2 1.4

1.9 Mld

Incentive system for biomethane production

- The development of biomethane is strategic for the enhancement of a circular economy based on reuse and is a relevant element for the achievement of European decarbonization targets.
- As part of the investment line provided by the PNRR with reference to biomethane development, **the reform of the incentive system originally provided for in the Interministerial Decree of March 2, 2018 is included.**
- The **outline of the new Decree** provides, inter alia, **some elements of interest to Snam, with particular reference to the structure of the incentive provided for FORSU and agricultural plants (capital contribution + reference tariff)**, which may support the development of the pipeline of projects planned by Snam as part of the 2021-2025 Plan.
- Ricom has carried out extensive **work on the subject of representation of interests in coordination with industry associations at the national level.**

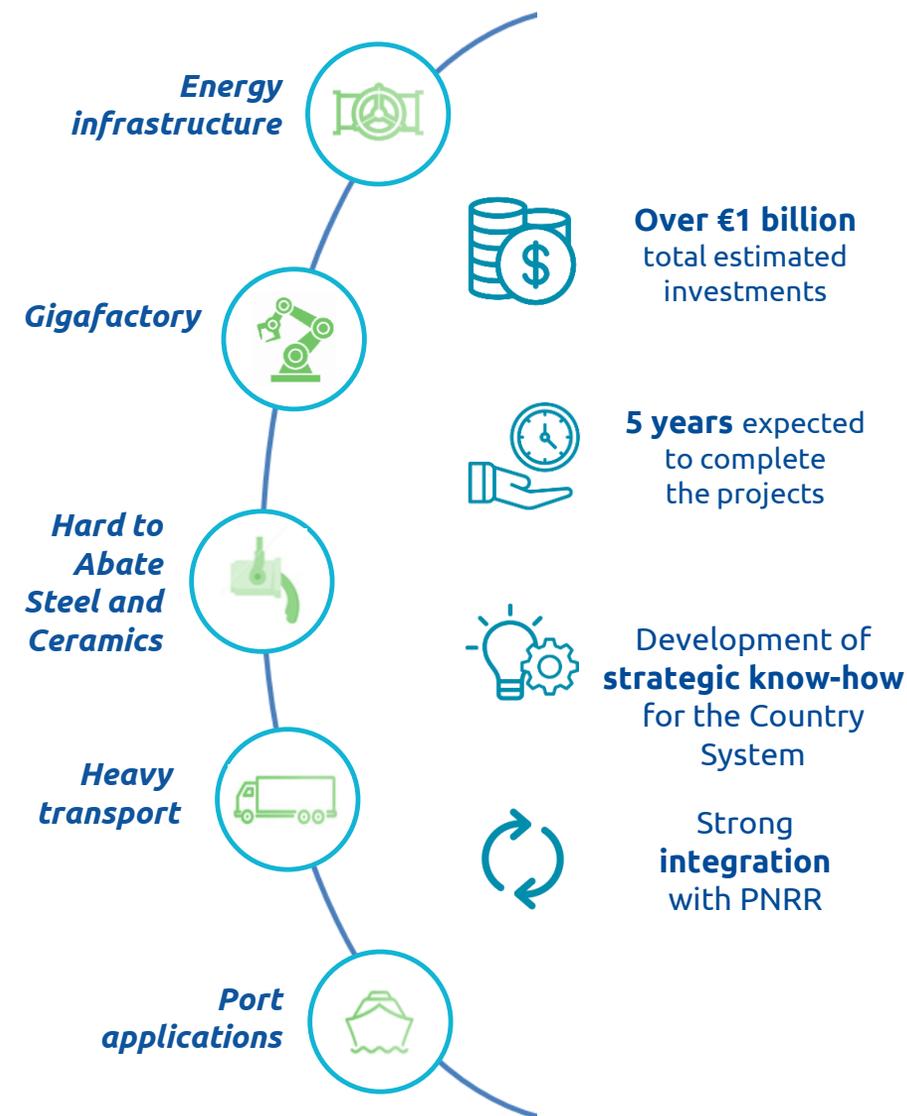
Snam's work on the Important Projects of Common EU Interest (IPCEI)

- Snam confirms its leadership in H2 IPCEI at national level with 6 shortlisted projects (out of a total of 53 at national level and over 400 at European level)
- **2 Snam projects** (Gigafactory and "Hard to Abate") **pre-notified in the first two waves on 31.08.2021** (out of a total of 13 at national level and about 130 at European level)
- **Hydrogen Valleys, H2 refuelling stations network and Hydrogen Port** projects pre-notified for the next wave

Snam actively participates in the **EU Clean Hydrogen Alliance (ECHA)** TSO&DSO Roundtable

Snam's proposals have been selected by the Italian Government for the H2 IPCEI matchmaking, with projects including **scaled and replicable** initiatives on:

- **Gigafactory** for the production of electrolyzers (pre-notified on 31.08.2021)
- **Hard to Abate** for decarbonization of the steel and ceramics industries (pre-notified 08/31/2021)
- **Hydrogen Valleys** for integrated ecosystems in the hard-to-abate sectors
- **Mobility Corridors: Network of hydrogen refueling** stations for heavy transport
- **Mobility Corridors: Hydrogen Port** for the realization of applications of "cold ironing" and hydrogen port logistics



Reforestation and CO2 absorption: Snam's commitment

Arbolia, born from an idea of Snam and Cassa Depositi e Prestiti, is the new «benefit company» launched in November 2020 to develop new green areas in Italy through the planting of trees

In Italy there are currently 12 bn trees but they are mainly outside cities. In the last two years the number of trees planted has more than doubled (from 114k in 2017 to 250k in 2019).

Arbolia creates forests in urban areas to improve ecosystems, promote biodiversity and make cities more resilient.

Arbolia also offers forestry and carbon footprint services to corporates and citizens in order to contribute to the fight against climate change, improve air quality and create development opportunities for Italian cities and territories.



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ARBOLIA

#rootsforthefuture

www.arbolia.it



ESG at the heart of the corporate strategy: towards the energy transition

- 360 ° stakeholder engagement - **ESG Roadshow** in **2021** with more than **300 participants**
- Third party capacity building through **ESG training: collaborations with universities and companies**
- **Creation of alliances / partnerships on key issues** - eg. Generazione Donna (25 companies)
- Best practice in **integrated reporting / non-financial reporting** and **ESG indices**
- Inclusion of **initial ESG analysis also on new assets**

Environment

Reduction of **emissions**

- **First European TSO** to have a **Net Zero target by 2040** and a **Scope 3 target**

Development of **green gases** and **energy efficiency**

- **Renovit** company **B Corp**

Dialogue with **international standard setters**

- SBTi, B Corp

Integration **of the E and S for the just transition**

- Focus on our people and the territory
- Project development on **energy poverty**

Social

Increased **employee wellbeing** through a strong push on **diversity and inclusion**

- More women at all levels and greater attention to other diversities

Incentive for suppliers who have **ESG strategies**

- Through **ESG training** and by including the ESG component in the **tender criteria**

Listening to the needs of the territory and creating a network of partners for a greater impact

- 170 **Snam Foundation** partners in 2021

Governance

Further development of the process for the inclusion of **ESG risks / opportunities** in the **ERM** model

- **6 quantitative risks, 5 qualitative risks and 5 opportunities** identified

Best practice in reporting - **Oscar di Bilancio 2021**

Increase in **remuneration** linked to **ESG issues**

- Reached **20%** of the total weight (both in the short and long term) and including the 3 areas E, S and G

Inclusion of the **Purpose** and **gender equality** in the **Bylaws**



Thank you



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C L I F F O R D

C H A N C E



**HYDROGEN: A KEY FACTOR FOR ESG STRATEGY
AND CERTAINTY OF SUPPLY**

Umberto Penco Salvi

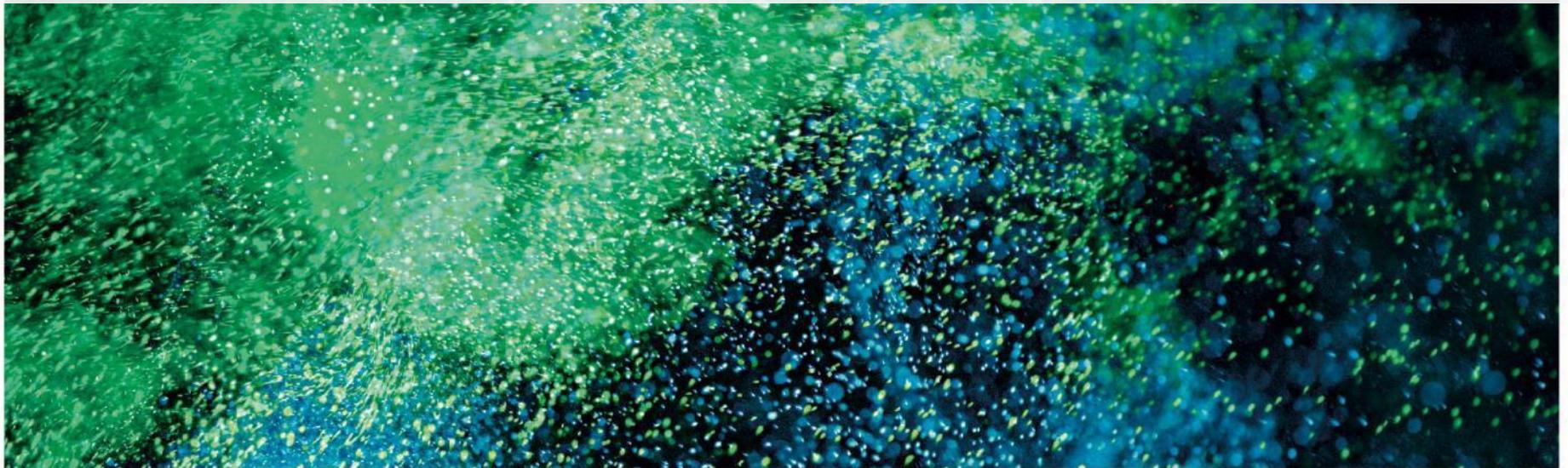
17 May 2022

OUR FOCUS TODAY





ESG STRATEGY



WHY H2 IS IMPORTANT IN ESG STRATEGY?



- 1 Green H2 is a **low or zero-emission** fuel produced using renewable energy sources with high social acceptance
- 2 Global focus on using H2 as a **source of energy to replace gas** in gas turbines to make electricity, to make heat for home heating or steelmaking. Also, H2 can be transported and stored.
- 3 Key markets may be significant outlets for initial production of clean hydrogen: **green cement production, green steel production and fuel-cell heavy transports and vehicles**

H2 IS ALSO BECOMING IMPORTANT FOR THE CERTAINTY OF SUPPLY

Certainty of energy supply is one of the main issue to issue as a consequence of the recent dramatic conflict in Ukraine.



- 1 Green H2 as **new renewable fuel capable to balance the production of energy through the “traditional” renewables** (wind, solar) by powering electrolizers when the demand is low
- 2 Green H2 as **renewable fuel to be developed independently and not subject to the gas importation routes**
- 3 Geopolitical uncertainty and unpredictability of commodities price require a **super diversified mix of energy sources** where H2 can play a key role

The background of the slide is an abstract, artistic composition of light. It features a dense field of small, out-of-focus circular spots in various shades of blue, teal, and green, set against a dark, almost black background. The lights appear to be scattered and slightly blurred, creating a sense of depth and movement, similar to a bokeh effect in photography or a starfield in space. The overall color palette is cool and vibrant, with the blues and greens being the most prominent colors.

CLEAN H2 IN ESG REPORTING

EU/UK COMPANIES AND GREEN HYDROGEN IN ESG REPORTING

Does green H2 have any role for EU companies in ESG reporting?

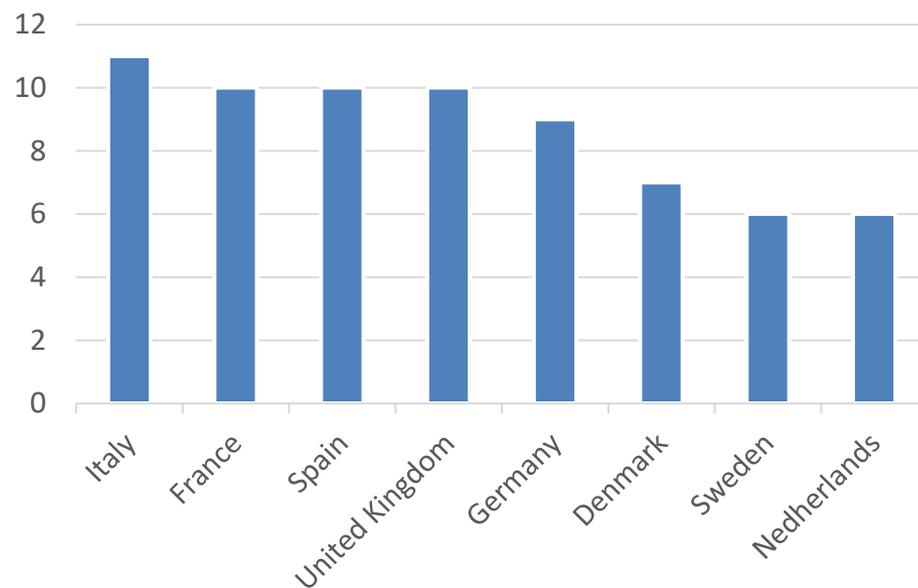
- We selected a sample of EU and UK companies to understand whether green H2 is part of their sustainability strategies
- The sample includes largest utilities, energy suppliers, transport players and other energy-intensive companies

- 1 Geographic focus**
Italy, France, Germany, Spain, United Kingdom, Sweden, Denmark and Netherlands.
- 2 Scope of the analysis:**
We considered a sample of 200+ companies and actually reviewed the reports of 70 companies.
- 3 Working method:**
We have reviewed Non Financial Statements and other ESG documentation of the concerned companies.

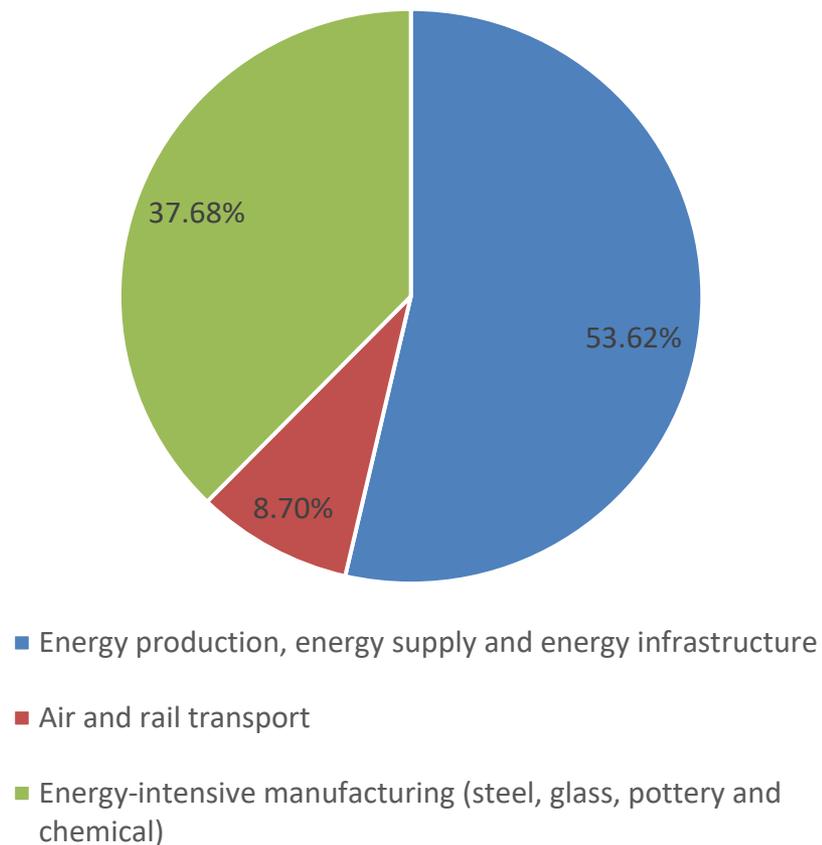
EU/UK COMPANIES AND GREEN HYDROGEN IN ESG REPORTING (continued)

Focus on scope of the analysis

Companies considered for each country



Companies considered by industry



EU/UK COMPANIES AND GREEN HYDROGEN IN ESG REPORTING (continued)

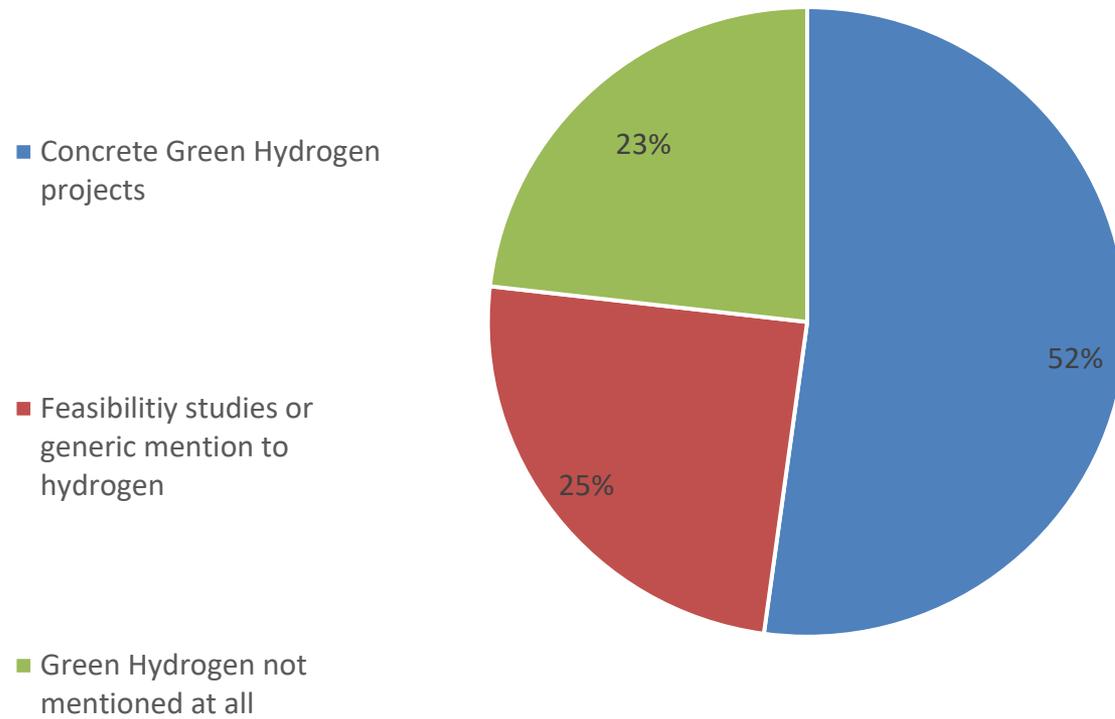
We have detected the following three approaches :

- 1** Companies that have developed concrete and structured projects already in operation or about to become operational shortly.

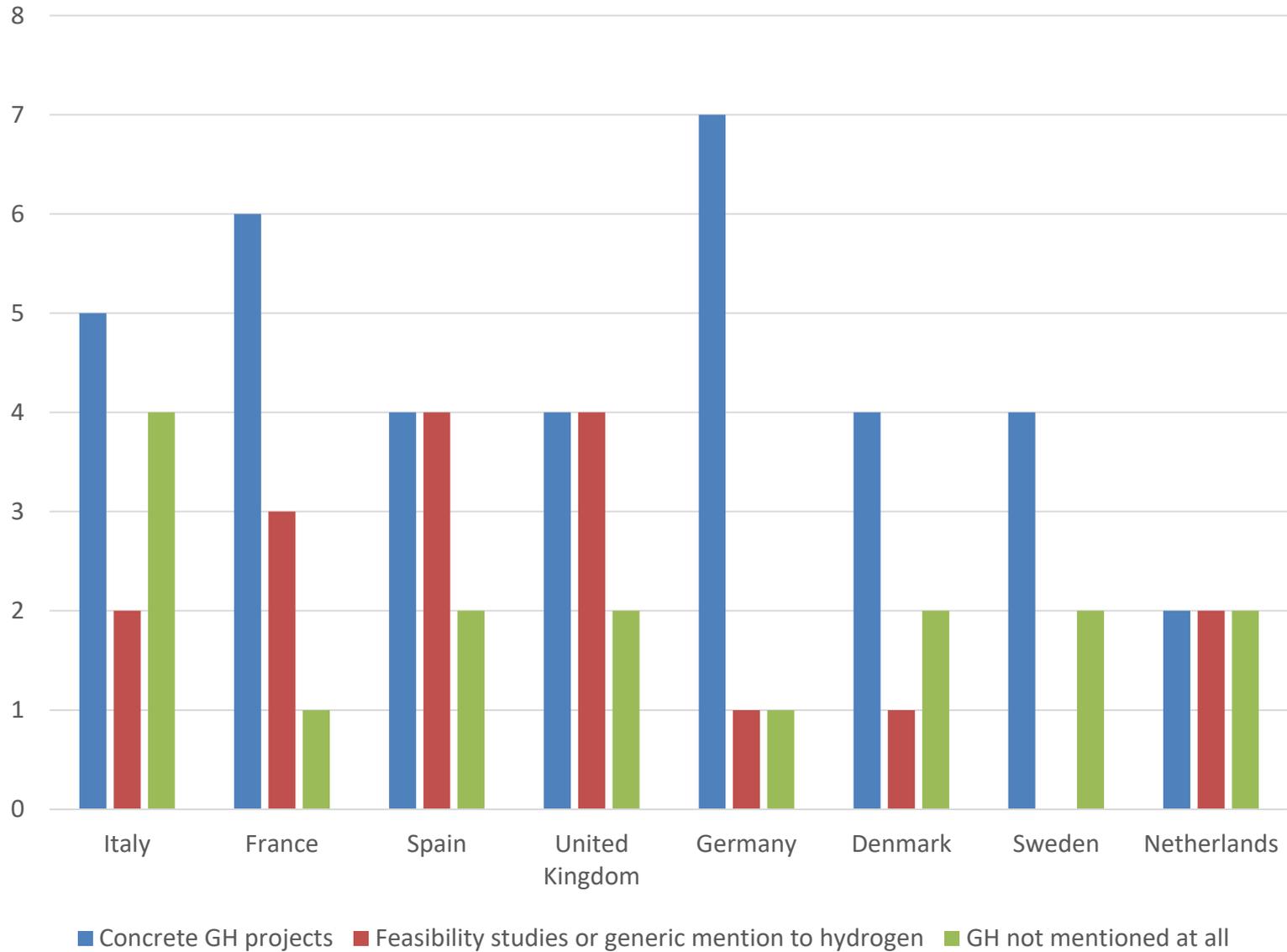
- 2** Companies which either (i) have realized feasibility studies on Green Hydrogen; or (ii) mention it without developing concrete projects at the moment; or (iii) refer to the use of H2 for sustainability purposes without specifying that it is Green H2.

- 3** Companies that do not refer to Green H2 at all as part of their business and sustainability strategies.

OUTCOMES OF THE ANALYSIS (continued)

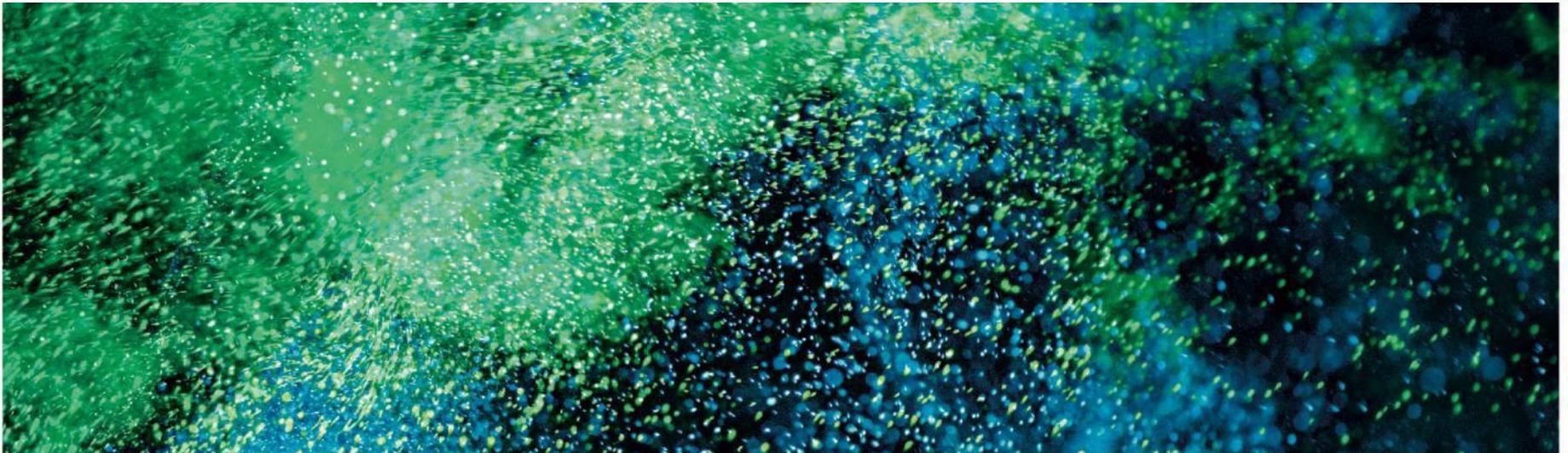


OUTCOMES OF THE ANALYSIS



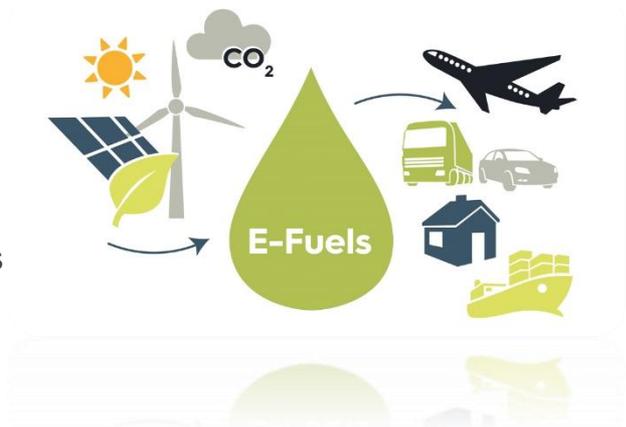


TRENDS



Cheap, secure, and renewable: EU bets on green hydrogen to fix energy woes

- The war in Ukraine has turbocharged the H2 development. Green H2's potential win comes at the expense of its fossil fuel-linked **blue and grey alternatives, whose costs have increased by over 70% since the start of the war in Ukraine**, rising from about \$8/kg to \$12/kg.
- EU announced plans for a €300 million funding package for H2 as well as the **Hydrogen Accelerator initiative from REPowerEU** aiming at reducing the region's dependence on Russian gas with a further wave of **support packages for green hydrogen specifically**.

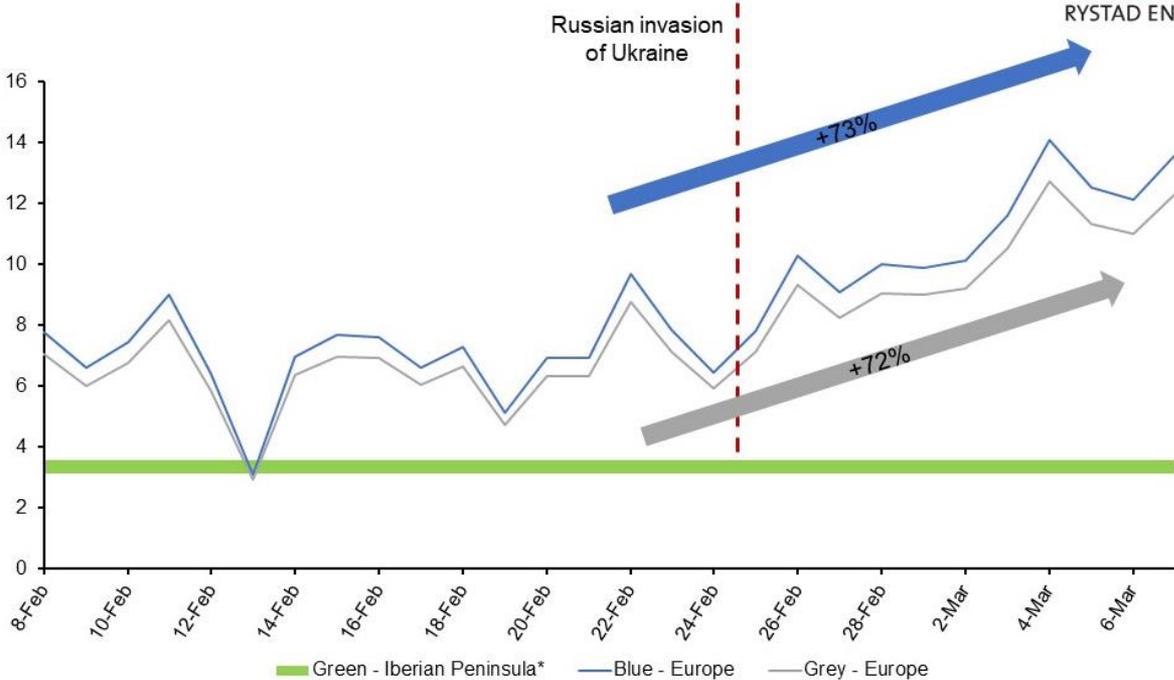


Cheap, secure, and renewable: EU bets on green hydrogen to fix energy woes (continued)

Levelized cost of hydrogen in Europe
USD/kg hydrogen



RYSTAD ENERGY



*Price based on 2020/21 renewable auctions in Spain and Portugal
Source: Rystad Energy HydrogenCube

Cheap, secure, and renewable: EU bets on green hydrogen to fix energy woes (continued)

- **REPowerEU and Hydrogen Accelerator** – renewable hydrogen production and imports as key pillar for the resilience of the EU-wide energy system and achieve certainty of energy supply. EU is currently on track to produce **3 million tons** green H2 per annum by 2030. The new RePowerEU target put it at **15 million tons for EU**
- Green H2 is an attractive alternative for EU, with **Germany** already planning to produce **25 gigawatts (GW) by 2040**, **Spain** on track to produce more than **4 GW by 2030** and **Italy** planning to install **5GW capacity electrolysis by 2030** according to Italian Recovery Plan



- Against this background, EU players have started looking at **green H2 as a valid alternative to:**
 - **decarbonize the “hard to abate sectors”** (factories producing steel, cement, glass chemical); and
 - **achieve certainty of supply** in an uncertainty context deriving from the war and the energy crisis

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C H A N C E

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SEERIL

MIRANDA

Miranda & Associados Sociedade de Advogados, SP, RL

'THE TECHNOLOGY LEADS, THE LAW FOLLOWS'

Developments in the Hydrogen (H₂) front:
short reflections on the Portuguese case

Nuno Antunes

Partner, Co-Head of 'Energy and Natural Resources'
AIEN, Hydrogen Taskforce Lead

17 May 2022

STATUTORY DEVELOPMENTS IN PORTUGAL

- **Climate Framework Law**

Backdrop for construing statutory issues on renewable fuels/gases

- **Swift and socially balanced transition to a sustainable economy and carbon-neutral society**
- **Targets: 2030 – 55% | 2040 – 65% a 75% | 2050 – 90%**
- **International cooperation for global decarbonization**

Energy Policy

- **Decarbonization of: (i) power production; (ii) residential sector and public buildings; (iii) mobility**
- **Promoting energy transition particularly in (iv) industry**

Fuels and Gases Policy

- **Replacing fossil fuels for electricity or renewables gases**
- **Fostering production, distribution and use of renewable gases**

STATUTORY DEVELOPMENTS IN PORTUGAL

- **CoM Res. 63/2020 (H2 National Strategy)**
- **Decree-Law 62/2020 (Gas System)**
- **Decree-Law 60/2020 (GOs)**
- **Law 98/2021 (Climate Framework)**
- **Order 325-A/2021 (Incentives to Industry Decarbonization)**
- **Decree-Law 15/2022 (Electricity System)**
- **Order 98-A/2022 (Incentives to Renewable Hydrogen Production)**
- **Order 112/2022 (Electrointensive Customer Statute)**
- **Decree-Law 30-A/2022 (Temporary Exceptional Measures)**

10 to 15% injection into natural gas networks

50 to 100 H2 fuel stations

2% to 5% in industry energy consumption

2 to 2.5 GW of installed capacity of electrolyzers

1% to 5% in road transport energy consumption

7,000-9,000 M€ of investment in H2 related projects

3% to 5% in domestic maritime transport

300 to 600 M€ reduction in imports of natural gas

1.5% to 2% in final energy consumption

GREEN HYDROGEN / AMMONIA PROJECT (500 MW)

INDUSTRIAL SCALE

MadoquaPower2X 

~500 MW
H₂ electrolysis
capacity

400+ ktpa
CO₂
avoided

500 ktpa
ammonia
envisioned

€1B+
project
investment

200+
jobs created

GREEN HYDROGEN / AMMONIA PROJECT (500 MW)

INDUSTRIAL SCALE



LAW IS PLAYING 'CATCHING-UP': SOME CHALLENGES

- **Hydrogen Developments: Short Reflections on the Portuguese Case**
 - No 'framework law' on H2 – basic requirements in NGS law
 - 'Blue H2' / 'Turquoise H2': Excluded from National Gas System law
 - Self-consumption in H2 projects: 'proximity' and 'electrointensity'
 - Environmental Assessment: H2 production vs H2 'carriers'
 - H2 production outside Emissions Directive: other project segments?
 - Registration requirements changed by temporary measures
 - No integration with certain H2 uses: e.g. CO2 in synfuels Projects
 - Use of CCfD yet to be confirmed / regulated
 - Long-term storage (salt caverns) seems to have been 'forgotten'
 - No overarching vision of H2 supply/demand on project basis

HYDROGEN COLOUR PALETTE

			
Grey	Natural Gas	CO ₂	++
Blue	Natural Gas	CO ₂	+++
Green	Water	-	+++++
Brown	Lignite	CO ₂	+
Black	Coal	CO ₂	+
Turquoise	Natural Gas	Solid C	+++
Pink	Water	-	+++++
Yellow	Water	-	+++++

LAW IS PLAYING 'CATCHING-UP': SOME CHALLENGES

- **Hydrogen Developments: Short Reflections on the Portuguese Case**
 - No 'framework statute' on H2 – Basic requirements in NGS law
 - 'Blue H2' / 'Turquoise H2': Excluded from National Gas System law
 - Self-consumption in H2 projects: 'proximity' and 'electro-intensivity'
 - Environmental Assessment: H2 production vs other project segments
 - H2 production outside IED regime: other technologies (e.g. pyrolysis)?
 - Registration changed by temporary measures
 - No integration with certain H2 uses: e.g. CO2 in synfuels projects
 - Use of CCfD yet to be confirmed / regulated
 - Long-term storage (salt caverns) seems to have been 'forgotten'
 - Overarching vision of H2 supply/demand on project basis required?

Thank you.

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Renewable Fuels - Japan

May, 2022

Sadayuki Matsudaira

Nishimura & Asahi

Carbon Emission Reduction Target - Japan

■ Carbon Emission Reduction Targets

- INDC (Intended Nationally Determined Contribution) of Japan under Paris Agreement: minus 26% in FY 2030 (from FY 2013)
- Ambitious 2030 Emission Reduction Target: minus 46% in FY2030 (from FY 2013)
- Expressed 2050 net zero

■ Energy Resources in 2020

- Fossil Fuels 84.8% (Oil: 36.4%, Coal: 24.6%, Gas: 23.8%)
- Non-Fossil Fuels 15.2% (Nuclear: 1.8%, Hydro: 3.7%, Renewables: 6.7%, Wastes: 3.0%)

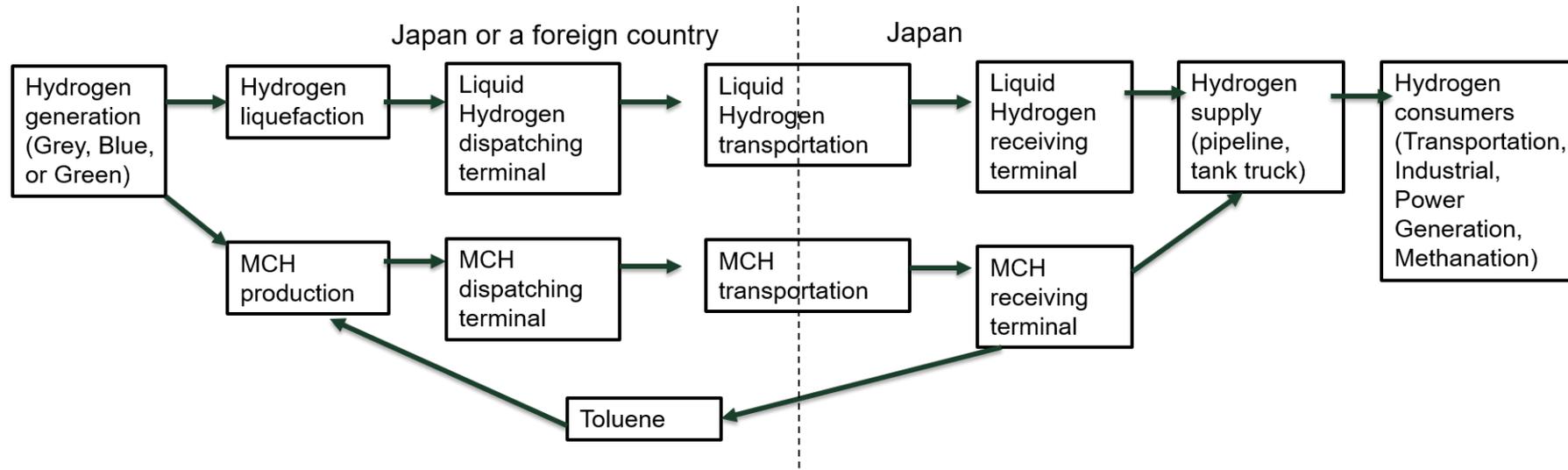
- The Sixth Fundamental Energy Plan of Japan determined by the Cabinet in October 2021 includes:
 - The government's clarification of its target to develop the supply chain of hydrogen (generation, transportation, storage, supply and use)
 - Targets to decrease the supply cost of hydrogen from JPY 100 per Nm³ in 2020 to JPY 30 per Nm³ in 2030, and to JPY 20 per Nm³ per 2050.
 - Targets to generate about 10% of total electricity from hydrogen and ammonia in 2050
 - Plans to increase the annual demand of hydrogen to 3 million tons in 2030, and 20 million tons in 2050.
 - Targets to develop the use of hydrogen not only for vehicle use but also for power generation (hydrogen only, or a combination with coal or gas), industrial use such as iron manufacture by use of hydrogen instead of cokes, and methanation.

* USD 1 ≒ JPY 130 (as of May 6, 2022)

Hydrogen Projects and Governmental Subsidies

- Need to develop both upstream and downstream projects / infrastructure concurrently.
- It is difficult to develop them only through private financing; public support plays important role.

<Hydrogen Supply Chain>



Hydrogen Projects and Governmental Subsidies

- The Japanese Government decided to provide the following subsidies (through Green Innovation Fund of NEDO (New Energy and Industrial technology Development Organization)) to hydrogen projects as follows:

	Project	Expected Total Project Cost	Amount of Subsidy	Companies Involved
1	A feasibility study project on the liquid hydrogen importation from Australia and storage	JPY 300 billion	Up to JPY 220 billion	Kawasaki Heavy Industry and ENEOS, etc.
2	A feasibility study project on hydrogen separation from MCH by using the existing oil refinery facility	JPY 90 billion	Up to JPY 63 billion	ENEOS, JGC Holdings
3	A large scale (40MW) water electrolysis project for renewable power generation	JPY 75 billion	Up to JPY 54 billion	Asahi Kasei, etc.
4	A PEM type (16MW) water electrolysis project	JPY 14 billion	Up to JPY 10 billion	Yamanashi Prefecture, TEPCO, etc.
5	Electricity generation projects with using hydrogen	JPY 51 billion in total	Up to JPY 31 billion in total	JERA, Kansai Electric and ENEOS
6	The development of hydrogen use (instead of cokes) for iron manufacturing	JPY 436 billion in total	Up to JPY 193 billion in total	Nippon Steel, JFE Steel, KOBELCO etc.

* USD 1 ≙ JPY 130 (as of May 6, 2022)

Hydrogen Regulation Reform

- Currently, there is no single integrated regulation on the hydrogen business.
- The High Pressure Gas Safety Act, Gas Business Act and/or Electricity Business Act applies, depending on the circumstances. For example:
 - Hydrogen supply through pipelines, and storage and gasification of liquidated hydrogen at a terminal linked to pipelines shall be subject to the Gas Business Act, which generally requires the odorization of gas (including hydrogen).
 - Use of hydrogen for generating electricity in a power plant shall be subject to the Electricity Business Act.
 - In other cases, hydrogen generation, storage, transportation, supply and use shall be subject to the High Pressure Gas Safety Act.
- The Government is considering to reform the laws to clarify and simplify the regulations applicable to the hydrogen business.

Biogas Power Generation

- Biogas (methane gas from fermentation of drainage mud, cattle manure and food waste) power generation can enjoy the FIT (Feed-in Tariff)
- Biogas power plants with FIT certification (issued by the Ministry of Economy, Trade and Industry) are entitled to sell their generated electricity to the electricity transmission utility at JPY 39 in the case FIT certification is issued in FY2022 (JPY 35 in the case the certification is issued in 2023) per kWh for 20 years.
- Beginning 2022, “local utilization” is required for biogas to obtain FIT certification. One of the “Local utilization” requirements is that a certain percentage of generated electricity shall be self-consumed or supplied to local community.

- Japan's two large air carriers, JAL (Japan Airline) and ANA (All Nippon Airways) declared their intention to reduce carbon emissions by using SAF (Sustainable Aviation Fuel).
- A Japanese venture company Euglena Co., Ltd. is producing SAF and other bio fuel gas from euglena.
- The Japanese government's fundamental energy plan also aims to increase the use of SAF and other bio fuels.

If you have any questions, please feel free to contact me.



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Tokyo 100-8124, Japan

Qualifications

- Admitted in Japan (2002)
- Admitted in New York (2012)

Education

- 2011 - University of Michigan Law School (LL.M.)
- 2001 - The University of Tokyo (LL.B.)

Professional experience

- 2021 - A member of the Committee on the Industrial Safety Regulations held by the Ministry of Economy, Trade and Industry of Japan
- 2021 - A member of the Committee on the Electricity Capacity Market held by OCCTO (Organization for Cross-regional Coordination of Transmission Operators, Japan)
- 2016 - Regional Vice Chair, Asia Pacific of the Energy Group of Lex Mundi
- 2011 - 2012 Debevoise & Plimpton LLP, New York
- 2008 - 2010 Mizuho Securities Co., Ltd.

Sadayuki has a wealth of experience in the energy sector, including hydrogen, renewable power projects, electricity, gas and heat-supply businesses, and advises both international and domestic clients on a variety of energy-related areas such as power plants, gas terminals, networks, and energy wholesale and retail businesses. He also advises on the development of projects, acquisitions, joint ventures, alliances and reorganizations, the development of new businesses, compliance with energy regulations, cooperation with governmental bodies, and dispute resolution.

Awards

Leading Individual: Bengoshi - Projects and Energy: Independent Local Firms (Japan), The Legal 500 Asia-Pacific 2021

Major Cases

- Advised both international and domestic clients on the development of projects and acquisitions in the renewable power projects
- Advised on the development of variety of new businesses in the energy sector
- Advised on the hydrogen businesses and gas businesses

Recent publications

- Japan chapter of “Getting the Deal Through - Electricity Regulation” (2022 Edition), published by Law Business Research, London, UK
- “Renewable Energy 2022: Japan”, published by International Comparative Legal Guides (ICLG)

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OF LAW, MILAN, ITALY

Power-to-X:

Energy Transition Opportunities

Presented By

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What is Power-to-X?

Arguably originating in Germany, PtX is a blanket term for a number of technologies that are all based on using electricity to produce hydrogen.

In addition to hydrogen as a fuel / energy source in its pure form, PtX also uses hydrogen:

- as derivative fuels/energies, such as ammonia (in combination with nitrogen) or methanol (in combination with carbon)
- as a feedstock for products such as plastics and fertilizers, with “green” steel and cement also planned;
- transportable energy products, such as Liquid Organic Hydrogen Carriers (LOHC); and
- as energy storage, convertible to other energy forms.

POWER-TO-X: CHEMICAL / ELECTRICAL SYNERGIES

Who's in on Power-to-X



Hydrogen Council members

4 Pillars of a National PtX Policy

- Denmark, in recognition of the commercial opportunities, has gone so far as to issue a stand-alone *Government Strategy for Power-to-X*, which mandates:
 - **1) Power-to-X must be able to contribute to the realisation of the objectives in the Danish Climate Act.**
 - **2) The regulatory framework and infrastructure must be in place to allow Denmark's strengths to be utilised and for the Power-to-X industry to operate on market terms in the long run.**
 - **3) The integration between Power-to-X and the Danish energy system must be improved.**
 - **4) Denmark must be able to export Power-to-X products and technologies**
- These four founding objectives of the Danish PtX policy support a robust renewable energy sector, coming grid challenges in the push towards electrification and a desire to find markets for high value hydrogen-related exports.

Challenges of the Power-to-X Industry

Challenges:

- Most PtX projects are currently not economical. The plants lose energy in the conversion processes.
- PtX projects also deal with high levels of regulation.
- Insufficient amounts of profitable PtX projects.
- PtX projects can struggle with low efficiency.
- Direct electrification preferred where possible.



Source

Thank You

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