Chapter 3
2022 EU and National Policies Report
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FUEL CELLS AND HYDROGEN OBSERVATORY

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Executive Summary

Purpose:	The policy module of the FCHO presents an overview of EU and national policies across various hydrogen and fuel cell related sectors. It provides a snapshot of the current state of hydrogen legislation and policy.
Scope:	This report covers 34 entities and it reflects data collected January 2022 – February 2022.
Key Findings:	Hydrogen policies are relatively commonplace among European countries, but with large differences between member states. Mobility policies for FCEVs are the most common policy types. EU hydrogen leaders do not lag behind global outliers such as South Korea or Japan.

At the **EU level**, the regulatory framework applicable to the hydrogen industry is rapidly changing. Following the target of carbon neutrality by 2050, and the intermediate target of reduction of greenhouse gas (GHG) emissions by at least 55% by 2030, now enshrined in the European Climate Law,[1] 2021 was a year of major proposals, which will set the regulatory framework for the different economic sectors on a pathway to carbon neutrality by 2050. The European Commission's broad legislative review, under the Fit for 55 and Hydrogen and Decarbonised Gas Market packages,[2] which will set the regulatory framework for the next regulatory cycle, encompasses all sectors of the economy and contains numerous hydrogen related proposals. The review includes a broad legislative reviewing process of already-existing policies and a series of new legislative and non-legislative acts.

Some of the most notable changes in the regulatory landscape include the revision of the **Renewable Energy Directive**,[3] which is set to become far **more ambitious** regarding its targets, with **specific targets for hydrogen**.[4] The **Emissions Trading System Directive** is also set to change,[5] with the aim of providing for **higher emission reduction targets**, while at the same time being expanded in scope to cover additional sectors. Proposals for the Gas Directive and Regulation are also included,[6] aiming to **prepare the natural gas sector for the deployment of hydrogen and other decarbonized gases**. Additionally, **state aid rules and guidelines are also being adapted** to allow for the rapid **deployment** of new sustainable technologies including **hydrogen**. To accompany all these increased targets and obligations,

[1] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1119&from=EN >.

[2] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: 'Fit for 55': delivering the EU's 2030 Climate Target on the way to climate neutrality COM(2021) 550 final, avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021DC0550&from=EN >

[3] Proposal for a Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources, and repealing Council Directive (EU) 2015/652 COM(2021) 557 final, avaliable at WWW < https://ec.europa.eu/info/sites/default/files/amendment-renewable-energy-directive-2030-climate-target-with-annexes_en.pdf >

[4] More precisely the subtarget refers to renewable fuels of non-biological origin (RFNBOs) which includes hydrogen produced from renewable energy and fuels made from such hydrogen.

[5] Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union, Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading scheme and Regulation (EU) 2015/757 COM(2021) 551 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:618e6837-eec6-11eb-a71c-01aa75ed71a1.0001.02/DOC_1&format=PDF >

[6] Proposal for a Directive of the European Parliament and of the Council on common rules for the internal markets in renewable and natural gases and in hydrogen COM(2021) 803 final, available at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:2f4f56d6-5d9d-11ec-9c6c-01aa75ed71a1.0001.02/DOC_1&format=PDF > and Proposal for a Regulation of the European Parliament and of the Council on the internal markets for renewable and natural gases and for hydrogen (recast) COM(2021) 804 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:0c903f5a-5d8b-11ec-9c6c-01aa75ed71a1.0001.02/DOC_1&format=PDF >

the Commission has proposed a Carbon Border Adjustment Mechanism,[7] with the aim to protect the industrial sectors at risk of carbon leakage.

This report briefly presents the main policies which are relevant at the EU level, while the FCHO website provides more details on each policy and how it impacts hydrogen in the different areas of the value chain.

At national level, given the stage of the clean hydrogen industry, there are large discrepancies between the adoption rates of various policies among different countries. The outliers in having adopted the most hydrogen friendly policies in Europe are Austria, Finland, France, Germany, Italy, Sweden, United Kingdom, while, in the rest of the world, the countries with most hydrogen policies are South Korea, and the USA.

Policies supporting utilization of hydrogen in transport through fuel cell electric vehicles (FCEVs) are the most common from all sectors. The most common types of policies enacted in this field are purchase subsidies, registration tax benefits, and ownership tax benefits. 30 out of the 34 countries included in this year's report have at least one policy supporting FCEVs with 25 of them having three or more policies in place.[8] 23 out of the 26 EU/EFTA/UK countries have at least one FCEV supporting policy in place. Austria, France, and Norway have the largest number of subsidy policies supporting FCEVs with six financial and non-economic incentives in place while Ireland, Lithuania, Morocco, and Portugal are the only countries with no FCEV supporting policies.

Policies supporting hydrogen as a fuel and hydrogen refuelling infrastructure are also quite common. This type of policies include CAPEX support, mandates, permitting rules, and other policies. 27 out of 34 countries have at least one policy in place and 14 countries have three or more policies. Among EU/EFTA/UK, 22 out of 26 countries have at least one policy with Czech Republic, Germany, Italy, and United Kingdom having adopted four different policies. The most common refuelling infrastructure policies include permitting guidelines and other policies in 17 countries and CAPEX support in 16 countries.

Policies supporting stationary fuel cell deployment such as CAPEX support and tax incentives are less common with only 13 out of the 34 countries having at least one policy in place. Among EU/EFTA/UK, 10 out of 26 countries have at least one policy. The leaders are Germany with four different policies, followed by Slovenia with three policies. CAPEX support for stationary applications is available in ten countries while tax incentives are enacted in five countries.

The most common policies supporting hydrogen production are CAPEX subsidies with 14 countries providing CAPEX subsidies in some form for renewable or low-carbon hydrogen production plants.[9] These funding sources are implemented through different instruments. Under its National Recovery and Resilience Plan, Bulgaria plans to support renewable hydrogen production with up to 50% of CAPEX support. Chile has a subsidy scheme for electrolysers over 10 MW. France is planning a CAPEX and OPEX support mechanism for hydrogen production plants. In Germany, electrolysers built for hydrogen production for the transport sector are eligible for support at a 45% funding rate. The second most common hydrogen production policies are exemptions from or reductions of electricity price components when producing hydrogen. Such types of incentives are available in five countries. In Sweden and Denmark, electricity for hydrogen production is exempt from the electricity tax. In Germany, under the German Renewable Energy Sources Act (EEG) 2021, the EEG levy for electricity for

[7] Proposal for a Regulation of the European Parliament and of the Council establishing a carbon border adjustment mechanism COM(2021) 564 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:a95a4441-e558-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF >

[8] The full list of the 34 covered countries is in the Annex.

[9] Nine of those are in EU/EFTA/UK.

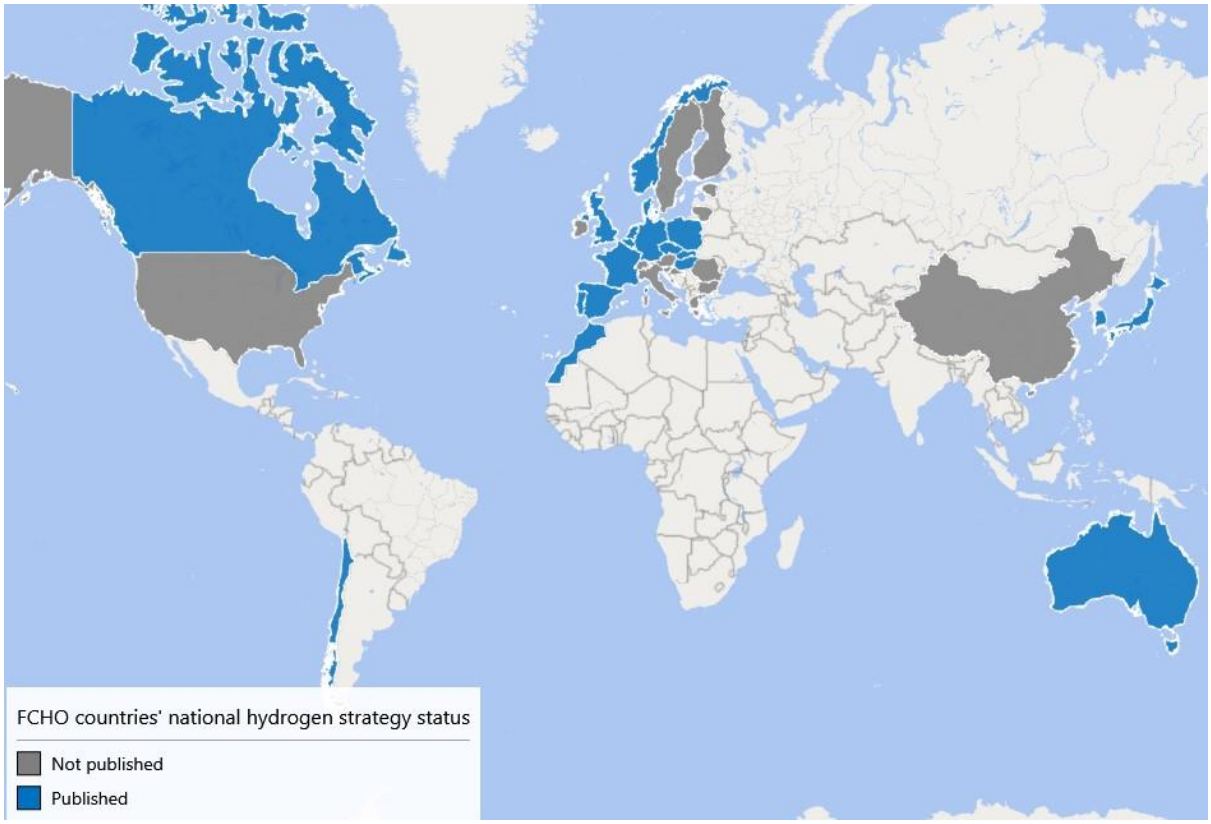
renewable hydrogen production is zero. In addition, in the case of the use of grid electricity with guarantees of origin, electrolysers are exempt from grid charges under the Energy Industry Act.

In regard to **hydrogen transmission**, out of the 34 countries covered in this report, Denmark and Germany are the only two countries with a specific policy in the area. The policies enacted in the two countries apply to the allocation of gas grid connection costs between the network operator and the hydrogen production plant operator.

As hydrogen is widely used in **industrial applications**, policies supporting the introduction of renewable or low-carbon hydrogen in industry are increasingly common. Low-carbon hydrogen demonstration subsidies are the most common form of support, being available in 19 countries (16 in EU/EFTA/UK). Some form of CAPEX support for renewable/low carbon hydrogen production used in industry for non-demonstration projects are in effect in six countries Austria, Belgium, Bulgaria, Finland, Germany, and the Netherlands.

Hydrogen roadmaps and strategies are relatively commonplace. Among the surveyed countries, 19 out of 34 have a national hydrogen strategy compared to 12 countries last year. Figure 1 visualizes hydrogen strategy adoption in the covered countries.

Figure 1: FCHO countries with national strategies in place



1. Introduction

1.1. Material and Geographical Scope

The section of the Fuel Cells and Hydrogen Observatory (FCHO) on "Policy, Regulation, Codes" provides users with a comprehensive overview of **the most relevant policies at EU, national or regional level that**

directly or indirectly affect the development and deployment of the hydrogen technologies under the scope of the Observatory.

While many legislative and non-legislative acts have a certain relevance for hydrogen technologies, the FCHO has chosen to focus on those policies that impact the business case for FCH technologies, meaning that they are **relevant to decision makers** when deciding whether to apply (or not) an FCH solution in a particular field. Additional legal and administrative requirements which have to be complied with by project developers when implementing hydrogen solutions are already covered comprehensively by other sources and are not covered by the FCHO. [10]

Figure 2: Material scope of the FCHO Policy Module

1. Administrative and Legal Requirement (e.g. permitting, safety, etc.)
   → Required for implementation and compliance
   www.hylaw.eu

2. Legislation and policies which acknowledge and support the role of hydrogen for policy objectives (climate, energy, and transport, etc.)
   → Important for strategic decisions
   www.fchobservatory.eu

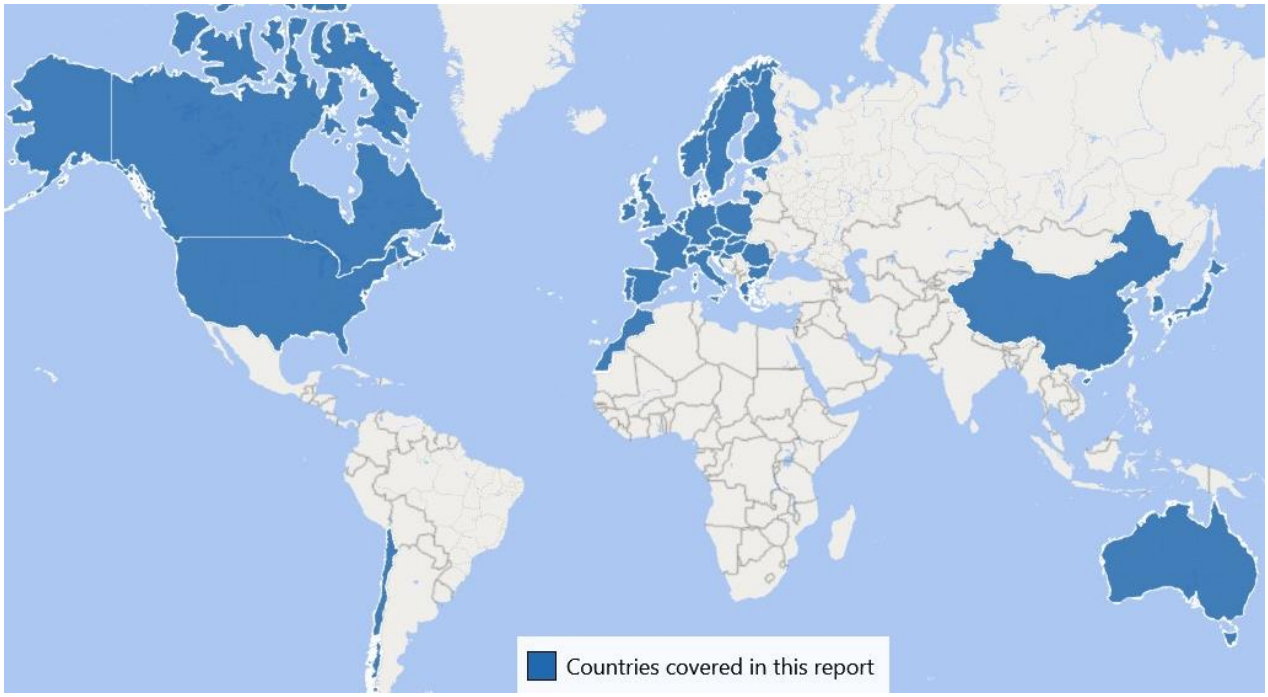
3. Relevant non hydrogen specific policies (e.g. mandates, obligations, taxes on fossil fuels, decarbonisation targets)
   → An additional reason to act
   www.fchobservatory.eu

At European Union (EU) level, the FCHO covers all relevant legislative (Regulations and Directives) and non-legislative (Institutional Communications) policies pursued by the EU with a strong impact on hydrogen technologies.

At a national and regional level, the FCHO covers 38 entities comprised of 37 countries and one sub-national unit, the State of California.[11] The entities have been chosen to cover the EU, EFTA, as well as other hydrogen outliers such as South Korea, Japan, China, and others. As of the writing of this report in March 2022, the FCH Observatory contained information from 34 out of the 38 entities, 26 of which are members of the EU/EFTA/UK.[12] The geographical coverage of this report is available in Figure 3, below.

[10] www.hylaw.eu
[11] Results for California represent the United States
[12] Data is unavailable for: Cyprus, Latvia, Luxembourg, and Malta. The entities for which data is only available from April 2020 and have not been updated as of writing of this report include Australia, China, Japan, Morocco. The entities for which data is only available from May 2021 and have not been updated as of writing of this report include Canada, Greece, and Ireland. Dutch data is updated and available online, but its 2022 update is not included in this report.

Figure 3: Geographical coverage of this report for national policies



National policies have been organized in the following categories: (i) fuel cell electric vehicles, (ii) stationary power, (iii) hydrogen as a fuel and hydrogen refuelling infrastructure, (iv) hydrogen production, transmission, and distribution, (v) hydrogen in industry, and (vi) general questions.

EU policies have been structured around 3 main areas of impact:

- Hydrogen production
- Hydrogen distribution[13]
- End-use sectors[14]

[13] Further broken down into (i) 'large scale storage', (ii) 'hydrogen in the gas grid', (iii) 'transport and storage in liquid carriers', (iv) 'transport by road, ship, etc.', and (iv) 'HRS for multiple applications'.
[14] Further broken down into (i) 'transport' ('road transport', 'maritime', 'aviation', and 'trains'), 'heat and power' ('stationary fuel cells' and 'hydrogen burners and turbines'), and 'energy intensive industry'.

2. EU Policies and Regulations

This report provides users with an overview of **the most relevant policies at the EU level that directly or indirectly affect the development and deployment of hydrogen technologies** covered by the Fuel Cells and Hydrogen Observatory (FCHO). The report presents an overview of those EU policies.

The report looks at a total of 24 policies, both of legislative and non-legislative nature enacted at the EU level. Legislative content typically involves a Directive (e.g. Renewable Energy Directive) or a Regulation (e.g. Regulation setting CO2 emission performance standards for new passenger cars and light-duty vehicles). Non-legislative content involves a high-level political strategy, roadmap, or communication (e.g. EU Green Deal communication or the Hydrogen Strategy).

The policies covered are presented in the table below.

Table 1: EU Policies covered by the FCHO

Planned and existing legislative and non-legislative policy measures covered by the FCHO	
Alternative Fuel Infrastructure Regulation	Green Deal
Carbon Border Adjustment Mechanism	Hydrogen Strategy
CO2 emission performance standards for new heavy-duty vehicles	Industrial Policy and State Aid
CO2 emission performance standards for new passenger cars and light-duty vehicles	Offshore Renewable Strategy
Effort Sharing Regulation	Public Procurement rules for clean vehicles
Energy Efficiency Directive	RefuelEU Aviation
Energy System Integration Strategy	Renewable Energy Directive
Energy Taxation Directive	Renovation Wave
EU Emission Trading System (ETS)	Sustainable and Smart Mobility Strategy
European Climate Law	Sustainable Finance (including R&D)
FuelEU Maritime	TEN-E Regulation
Gas Directive	TEN-T Regulation
Gas Regulation	

The FCHO website provides more information on these policies based on their relevance and impact across various value chain levels and applications of the hydrogen and fuel cell industry. For the EU policies section, those are broken down into three main categories: hydrogen production, distribution, and end-uses.

2.1. Overview

The **European energy and climate policy** landscape is going through significant changes, with the objectives of increasing the ambition to establish a regulatory framework conducive to the transition towards a climate neutral economy, accelerate greenhouse gas reductions, and foster the emergence of clean technologies, such as hydrogen. In late 2019, the newly elected European Commission presented its proposal for a **European Green Deal**.[15] This policy roadmap is meant to be 'the EU's new growth strategy. The communication builds on the political momentum where climate issues gained significant importance across the EU and it marks a strong shift in EU energy and climate policies. It provides significantly stronger emphasis on the decarbonisation dimension of the Energy Union. The Green Deal objectives are now being executed in many legislative and non-legislative initiatives, aimed at implementing the increased level of ambition. Most importantly, the **European Climate Law**,[16] was adopted by EU institutions in June 2021 and it sets into EU law the binding target of **net zero greenhouse gas emissions by 2050** (so-called 'carbon neutrality' or sometimes 'climate-neutrality') as well as a **55% greenhouse gas reduction target by 2030 for the EU**.

Some of the hydrogen relevant initiatives meant to enable this transition include the **Energy System Integration Strategy** and the **European Hydrogen Strategy**.[17] Both strategies, released as communications from the European Commission, show the importance of hydrogen in a decarbonised future economy, in applications such as high temperature industry (cement, etc.), feedstock in industry (steel, fertilisers), and heavy and long-haul transport (maritime, aviation, heavy duty vehicles, etc.). In these two strategies, hydrogen is seen as a key technology to link the components of the energy system (due to its versatility and its potential for energy storage and for decarbonisation of hard-to-abate sectors. In the European Hydrogen Strategy, the Commission sets clean hydrogen production targets: aiming for at least **6 GW of renewable hydrogen production capacity (i.e. electrolysers) by 2024** in the EU (resulting in the production of 1 million tonnes of renewable hydrogen) and for **40 GW by 2030** with an additional 40 GW installed in the EU's neighbourhood (resulting in the production of 10 million tonnes of renewable hydrogen).

The legislative agenda of 2021 will define the regulatory regime for the next regulatory cycle for the EU's energy and hydrogen sectors. The **Fit for 55 package**,[18] meant to put the EU on track to achieve the 55% target, and the **Hydrogen and decarbonised gas market** package are two major bundles of legislation that aim to enable the achievements of the EU's climate targets. They should set a **regulatory framework conducive to the clean energy transition aligned with 55% GHG emissions reduction by 2030 and climate neutrality by 2050** and, among others, to **the development of a hydrogen economy**. The former package was presented on 14th July 2021, and the latter on 15th December 2021. The analysis provided in this report is based on the versions of legislations prior to the adoption of the revised legislative acts under both packages, while also noting the proposed changes by the Commission. The

[15] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: The European Green Deal COM(2019) 640 final, available at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:b828d165-1c22-11ea-8c1f-01aa75ed71a1.0002.02/DOC_1&format=PDF >
[16] *Supra* note 1
[17] Communication from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions: Powering a climate-neutral economy: An EU Strategy for Energy System Integration (COM(2020) 299 final, avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0299&from=EN > and Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A hydrogen strategy for a climate-neutral Europe COM(2020) 301 final, available at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0301&from=EN >
[18] *Supra* note 2

legislative review consists of the revision of 11 already-existing legislations and four new ones as outlined in Table 3 below.

Table 2: Main hydrogen relevant policy items planned under the Fit for 55 Package

Main hydrogen relevant policy items planned under the Fit for 55 Package
Carbon Border Adjustment Mechanism
FuelEU Maritime – green European maritime space
ReFuelEU Aviation – sustainable aviation fuels
Revision of the Renewable Energy Directive
Revision of the EU Gas Regulation
Revision of the EU Gas Directive
Revision of the EU emission trading system (ETS)
Revision of the Energy Taxation Directive
Revision of the Energy Performance of Buildings Directive
Revision of the Energy Efficiency Directive
Revision of the Directive on Deployment of Alternative Fuels Infrastructure (Regulation)
Revised CO2 emission standards for cars and vans
Review of the Effort-Sharing Regulation

2.2. Energy

The current version of the **Renewable Energy Directive** sets a 32% target share of renewable energy in the EU's gross final energy consumption by 2030.[19] National contributions towards this target are determined by Member States, within their integrated national energy and climate plans (NECPs), in accordance with Regulation (EU) 2018/1999 (The Governance Regulation) and other acts (e.g. Effort Sharing Regulation, which is being revised).[20] The European Commission for the **revision of the Renewable Energy Directive proposed a 40% target of renewable sources in the Union's gross final consumption by 2030**.[21] As part of the revision, it also proposed **an industry target for 50% of the hydrogen used** for **final energy and non-energy purposes in industry** by 2030 to be Renewable Fuel of Non-Biological Origin (**RFNBO).**

Hydrogen can support Member States in the achievement of their respective targets by reducing average emissions from the gas system, integrating more renewable energy in the transport and industrial sectors, as well as acting as a grid balancing instrument and energy storage. Indeed, the Commission repeatedly mentioned the use of hydrogen for energy storage (not least for seasonal large-scale storage) which is to play a "nodal role" to foster energy system integration. This was specifically

[19] Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources (recast), avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02018L2001-20181221&from=EN >

[20] Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, available at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02018R1999-20210729&from=EN >

[21] *Supra* note 3

acknowledged in the **Offshore Renewable Strategy** which focuses on the potential of offshore hydrogen production and transport of molecules via pipelines onshore in a system efficient manner.[22]

The **EU's Emission Trading System (EU ETS)** is another major legislation that is being reviewed under the Fit for 55 package. The current ETS covers around 45% of the EU's greenhouse gas emissions, which are not subject to the Effort Sharing Regulation (ESR).[23] While the ESR provides binding targets for member states per sector, ranging from 0% to -40% compared to 2005 emission levels, the ETS Directive (2003/87/EC) has the objective to contribute to the overall reduction of CO2 emissions by 40% by 2030 compared to 1990 levels (i.e. a 43% reduction by 2030 compared to 2005 levels), based on its last revision in 2018. **In the new proposal, the target for the ETS is a GHG emissions reduction by 61%** compared to 2005 levels. To achieve this reduction, the proposal has five main elements: a reduced cap and a stricter linear reduction factor, revised rules on free allocation of allowances and market stability reserve, , inclusion of renewable hydrogen manufacturing plants in the system, the extension of the ETS to the maritime sector, a separate ETS for buildings and road transport, and an increase of the Innovation and Modernisation Funds and new rules on the use of ETS revenues. As for the ESR, its revision proposal aims to reduce emissions by at least 40% by 2030 compared to 2005 levels, which is an increase of 11% compared to the existing EU target of 29%.[24]

In this manner, both the emission (sectoral) coverage and the contribution of the ETS to emission reduction objectives (via reduced available allowances, etc.) could be expanded under the revision proposal. This could especially help accelerate the deployment of hydrogen in activities whose emissions are already covered by the cap-and-trade system, such as energy-intensive industries (e.g. steel, cement, etc.) or aviation, as well as in the sectors that may be added with this review (maritime, road transport and buildings). In addition, free allowances currently allocated to a number of industries could be progressively phased out as the new **Carbon Border Adjustment Mechanism (CBAM)** would be phased in.

The **CBAM** is another proposal under the Fit for 55 Package aiming to establish a **mechanism which would equalise the price of carbon between domestic products and imports in selected sectors.**[25] Under the scheme, EU importers would be subject to a carbon price (via a CBAM certificate) whose price level would mirror that of the ETS (i.e. the carbon price that would have been paid, had the production taken place in the EU). According to the proposal, the mechanism would be introduced gradually and firstly apply to selected products at high risk of carbon leakage: iron, steel, cement, fertiliser, aluminium and electricity generation, with the possibility for the Commission to add further products through delegated acts. As to the period of application, between 2023 and 2025, a simplified system would be in place, where the obligation would be to report emissions embedded in imports. **The system would**

[22] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future COM(2020) 741 final, avaliable at WWW < https://ec.europa.eu/energy/sites/ener/files/offshore_renewable_energy_strategy.pdf >

[23] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC, avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02003L0087-20210101&from=EN > and Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013, available at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0842&from=EN >

[24] Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement COM(2021) 555 final, avaliable at WWW < https://ec.europa.eu/info/sites/default/files/proposal-amendment-effort-sharing-regulation-with-annexes_en.pdf >.

[25] *Supra* note 7.

kickstart from 2026, where CBAM certificates would need to be surrendered. At the same time, gradual phase-out of free allowances under the EU ETS for sectors covered by CBAM would take place.

Building on the Energy System Integration and Hydrogen Strategies,[26] in December 2021, the Commission proposed a new regulatory framework for the development of hydrogen and other clean alternative gas technologies in Europe in the **Hydrogen and Decarbonised Gas package**. Aiming at system integration and future-proofing the existing natural gas infrastructure, the package presents a set of proposals for revision of the Gas Directive and Gas Regulation.[27] **The hydrogen sector is inclusive to this revision and benefits from specific parts dedicated to hydrogen. A transition period until 2030 is envisaged to allow the needed flexibility for the development of the hydrogen market.** An important element, previously applied to the gas sector, which the Commission proposed to mirror into the hydrogen sector, are ownership unbundling and third-party access. All ownership unbundling models (OU[28], ITO[29], ISO[30]) are allowed until 2030. However, after 2030 hydrogen network operators would either have to adopt the ownership unbundling or the independent system operator regimes. For third-party access, the proposal would leave to Member States the choice on which regime to apply to onshore and offshore hydrogen infrastructure. Until 2030, negotiated third-party access is allowed however after 2030, networks would be subject to regulated third-party access. Additionally, the proposal includes the creation of a European Network for Network Operators of Hydrogen (ENNOH) to specifically focus on hydrogen infrastructure development, and a limit of 5% by volume of hydrogen blending in natural gas at interconnection points.

2.3. Transport

In the transport sector, 2020 was marked by the publication of the European Commission's **Sustainable and Smart Mobility Strategy** at the end of the year[31]. It presented the Commission's vision on transport, specifically under the light of the sector's decarbonisation challenge, entailing the required clean fuel supply ramp-up, clean fuel infrastructure deployment, fleet renewals, and demand stimulation, to cite several key aspects. The Strategy highlights the role that hydrogen and hydrogen-based fuels are expected to play.

In relation to road transport, the two regulations setting CO2 emission performance standards - **Regulation 2019/631 for passenger cars and light-duty vehicles and Regulation 2019/1242 for heavy-duty vehicles** – contribute to the promotion of low-carbon mobility by making standards stricter,[32] and emission reduction targets more ambitious. The former Regulation is being revised under the Fit for 55

[26] *Supra* note 17.
[27] *Supra* note 6.
[28] OU refers to ownership unbundling when a firm with network assets cannot be active or have interest in any competitive segment of the supply chain
[29] ITO refers to independent transmission operator when a firm with network assets may remain a part of a vertically integrated company but has to abide by various rules to ensure effective unbundling
[30] ISO refers to independent system operator when there must be a separate ownership and operation of network assets in addition to other conditions
[31] Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Sustainable and Smart Mobility Strategy – putting European transport on track for the future COM(2020) 789 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:5e601657-3b06-11eb-b27b-01aa75ed71a1.0001.02/DOC_1&format=PDF >
[32] Regulation (EU) 2019/631 of the European Parliament and of the Council of 17 April 2019 setting CO2 emission performance standards for new passenger cars and for new light commercial vehicles, and repealing Regulations (EC) No 443/2009 and (EU) No 510/2011 (recast), avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02019R0631-20211202&from=EN > and Regulation (EU) 2019/1242 of the European Parliament and of the Council of 20 June 2019 setting CO2 emission performance standards for new heavy-duty vehicles and amending Regulations (EC) No 595/2009 and (EU) 2018/956 of the European Parliament and of the Council and Council Directive 96/53/EC, avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R1242&from=EN >

package,[33] while the latter is being reviewed, with a proposal for revision expected in late 2022 or early 2023. The revision of Regulation 2019/631 aims to reduce the CO2 emissions of cars and vans, **increase the uptake of zero-emissions vehicles and stimulate innovation in zero-emissions technologies in the European automotive sector**. The new targets in the proposed regulation would see emissions of new passenger cars be 55% lower and of new vans 50% lower for 2030. By 2035, new passenger cars and vans would have zero emissions. FCEVs will benefit from these developments as they complement electric vehicles in decarbonizing road transport.

The **Alternative Fuels Infrastructure Directive** establishes a common framework for alternative fuels deployment.[34] The directive is also under revision, with the **Commission proposing to replace it with a regulation**.[35] Under the new regulation, the targets would become directly binding to all Member States. For road transport, mandatory targets for publicly accessible hydrogen refuelling stations by 2030 are envisaged, as well as the criteria regarding their number and technical specifications.

Together with the **Clean Vehicle Directive**,[36] which sets public procurement rules for clean vehicles and the **Green Public Procurement** instrument,[37] the proposed legislative changes are expected to boost demand for clean vehicles (including FCEVs) and to bolster the deployment of infrastructure for the distribution of clean transport fuels like hydrogen. This includes the proposed changes to the **Renewable Energy Directive**,[38] which would replace the existing target that fuel suppliers ensure that at least 14% of the energy content of the fuels they supply for road and rail is provided by energy from renewable sources, with a new one that fuel suppliers ensure that the **amount of renewable electricity and fuels supplied to the transport sector achieve a reduction of GHG emissions of at least 13% by 2030**. Furthermore, an additional target for renewable fuels of non-biological origins (RFNBOs) is proposed in the directive: **at least 2.6% share of RFNBOs in 2030**. Moreover, as it stands, the revision proposal for the **ETS Directive** would set up **a separate emission trading system, running in parallel to the existing ETS, which would cover emissions from the road transport, together with those of buildings.**[39]

For the **aviation and maritime sectors**, significant changes are proposed in several legislative acts under revision as part of the Fit for 55 package. Firstly, as it stands the above-described obligations on fuel suppliers under the revision of the Renewable Energy Directive, would also apply to the maritime and aviation sectors. Secondly, under the revision of the Energy Taxation Directive,[40] fossil fuels used as fuel for intra-EU air transport, maritime transport and fishing **ought to be no longer fully exempt from energy taxation in the EU**. Thirdly, under the revision of the EU ETS, the Commission proposes that the scope of the system is extended to the maritime sector, in order to control and help reduce GHG

[33] Proposal for a Regulation of the European Parliament and of the Council amending Regulation (EU) 2019/631 as regards strengthening the CO2 emission performance standards for new passenger cars and new light commercial vehicles in line with the Union's increased climate ambition, COM(2021) 556 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:870b365e-eecc-11eb-a71c-01aa75ed71a1.0001.01/DOC_1&format=PDF >.

[34] Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of alternative fuels infrastructure, avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02014L0094-20211112&from=EN >

[35] Proposal for a Regulation of the European Parliament and of the Council on the deployment of alternative fuels infrastructure, and repealing Directive 2014/94/EU of the European Parliament and of the Council COM(2021) 559 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:dbb134db-e575-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF >

[36] Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of clean road transport vehicles in support of low-emission mobility, avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02009L0033-20190801&from=EN >

[37] Green Public Procurement, avaliable at WWW < https://ec.europa.eu/environment/gpp/index_en.htm >

[38] *Supra* note 3

[39] *Supra* note 5

[40] Proposal for a COUNCIL DIRECTIVE restructuring the Union framework for the taxation of energy products and electricity (recast) COM(2021) 563 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:1b01af2a-e558-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF >

emissions. While the aviation sector is already covered by the ETS, the proposals envisage the consolidation of the number of aviation allowances at current levels, an application of a linear-reduction factor and increased auctioning of allowances. Lastly, two proposed regulations **ReFuelEU Aviation and FuelEU Maritime - would oblige the sectors to increase the use of sustainable fuels and to reduce GHG emissions**.[41] **ReFuelEU Aviation** proposal would require blending obligation for fuel suppliers of **2% of sustainable aviation fuels in 2025 up to 63% by 2050**. The **Fuel EU Maritime** regulation puts in place targets expressed as **reduction of GHG intensity of the energy used on-board compared to 2020. These targets range from 2% in 2025 to 75% by 2050.** Overall, these policies will impact mobility and transport, with the main objective of reducing greenhouse gas emissions. Hydrogen and fuel cell technologies have a major opportunity to benefit from this change due to their numerous applications across the transport sector.

2.4. Industrial and financial policies

Industrial and financial policies are expected to have cross-cutting impacts on the hydrogen industry and deployment of hydrogen technologies. These include the Commission's **Industrial Strategy** (March 2020),[42] the **European Clean Hydrogen Alliance**,[43] planned revision of state aid rules, notably for **Important Projects of Common European Interest (IPCEI)**,[44] and the **Climate, Energy and Environmental Protection Aid Guidelines (CEEAG)**,[45] three key landmarks to foster the uptake in the production and deployment of clean hydrogen technologies.

The **Clean Hydrogen Alliance** started in the second half 2020, aiming to **bring investors with governmental, institutional, and industrial partners to identify and build up a pipeline of viable investment projects along the hydrogen value chain** in order to create a clean hydrogen market. The Alliance identified more than 750 projects located across Europe, spanning all parts of the hydrogen value-chain. The Alliance is open to all public and private actors with activities in renewable and low-carbon hydrogen and is centred around six thematic roundtables (Production, Transmission and Distribution, Industrial applications, Mobility, Energy sector, Residential applications) which work to promote hydrogen deployment in Europe.

Regarding **State aid**, three documents are of relevance for State aid in relation to the hydrogen sector: **General Block Exemption Regulation (GBER),[46] Guidelines on State aid for climate, environmental protection and energy 2022 (CEEAG); Communication on Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest (2021)**. The GBER is currently under review, due to the Commission's consideration

[41] Proposal for a Regulation of the European Parliament and of the Council on ensuring a level playing field for sustainable air transport COM(2021) 561 final, avaliable at WWW < https://ec.europa.eu/info/sites/default/files/refueleu_aviation_-_sustainable_aviation_fuels.pdf > and Proposal for a Regulation of the European Parliament and of the Council on the use of renewable and low-carbon fuels in maritime transport and amending Directive 2009/16/EC COM(2021) 562 final, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:078fb779-e577-11eb-a1a5-01aa75ed71a1.0001.02/DOC_1&format=PDF >

[42] Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: A New Industrial Strategy for Europe COM(2020) 102 final < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0102&from=EN >

[43] European Clean Hydrogen Alliance, available at WWW < https://ec.europa.eu/growth/industry/strategy/industrial-alliances/european-clean-hydrogen-alliance_en >

[44] Communication from the Commission: Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of important projects of common European interest (2021/C 528/02), avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52021XC1230(02)&from=EN >

[45] Communication from the Commission: Guidelines on State aid for climate, environmental protection and energy 2022 (2022/C 80/01), available at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52022XC0218(03)&from=EN >

[46] Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty (GBER), avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02014R0651-20210801&from=EN >

that it is not deemed to be in line with the priorities of the European Green Deal and the Industrial and Digital strategies. Moving to the new **CEEAG,** they entered into force on the 28th January 2022. They work in combination with the other two documents and add a new complementary level applying to large European cross-border hydrogen projects across the value-chain. Their aim is to enable the Green Deal objectives by **broadening the categories of green investments and technologies that Member States can support to reach climate objectives**. Lastly, the Communication on Projects of Common European Interest was revised under the general review of competition policy and the revised version was published in December 2021. It serves as guidance on the assessment of public financing of IPCEIs (such as the one on hydrogen) under state aid rules. The communication **applies to large European integrated cross-border hydrogen projects of different TRL levels (RDI, First Industrial Deployment (FID) and Infrastructure deployment) across the value chain**.

Another important financial legislative development is the **EU taxonomy**,[47] a tool for investors to understand whether an investment is considered environmentally sustainable or not. The first technical screening criteria were adopted on 4th June 2021.[48] The Complementary Climate Delegated Act,[49] which contains technical screening criteria for energy generation from specific nuclear and fossil gaseous fuels activities, was approved in principle on 2nd February 2022. The EU taxonomy plan gives a clear signal that **clean hydrogen technologies, in a wide range of sectors, will be fostered as environmentally-sustainable solutions.** For hydrogen activities to be **aligned** with climate change mitigation objectives, the carbon footprint of hydrogen cannot exceed **3 tonnes of CO2e per tonne of hydrogen** (on an LCA basis).

Thus hydrogen is set to benefit from extra funding means and more favourable taxation (under the abovementioned revision of the Energy Taxation Directive), adding up to further investment tools like the Just Transition Mechanism (made up of a Just Transition Fund, a just transition scheme under InvestEU, and a public sector loan facility with the European Investment Bank backed by the EU budget), Horizon Europe Connecting Europe Facility (CEF), InvestEU, among others. The new public-private partnership, Clean Hydrogen JU, was established in November 2021 and will also follow in the steps of the successful Fuel Cells & Hydrogen Joint Undertaking I and II and focus on technology R&I for producing, distributing and storing clean hydrogen as well as solutions for hard to abate sectors to strengthen and integrate EU scientific capacity in order to accelerate the development and improvement of advanced clean hydrogen applications.

[47] Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005, avaliable at WWW < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020R0852&from=EN >

[48] Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation and for determining whether that economic activity causes no significant harm to any of the other environmental objectives, avaliable at < https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R2139&from=EN >

[49] Commission Delegated Regulation (EU) /... amending Delegated Regulation (EU) 2021/2139 as regards economic activities in certain energy sectors and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities, avaliable at WWW < https://eur-lex.europa.eu/resource.html?uri=cellar:8cee7f13-a162-11ec-83e1-01aa75ed71a1.0023.02/DOC_1&format=PDF >

3. National Incentives and Policies

3.1.Scope

Content

The National Policies part of the Observatory module on "Policy, Regulation, Codes" provides users with a comprehensive overview of the most relevant policies on a national or regional level that directly or indirectly affect the development and deployment of the hydrogen technologies covered by the Observatory.

Information is organized around six major chapters described in the table below.

Table 3: Categories of national policies covered by the Fuel Cells and Hydrogen Observatory

Sector	Explanation of context
1. Fuel cell electric vehicles	Policies that may prevent or support FCEVs and/or the substitution of conventional vehicles with zero-emission solutions
2. Stationary power	Policies that may prevent or support the deployment of stationary fuel cells and/or the substitution of grid electricity / gas with heat and power produced from fuel cells
3. Hydrogen as a fuel and hydrogen refuelling Infrastructure	Policies that may prevent or support hydrogen as a fuel / hydrogen refuelling stations and/or the substitution of fossil fuels with hydrogen
4. Hydrogen production, transmission, and distribution	Policies that may prevent or support production of hydrogen and its subsequent transmission and distribution
5. Hydrogen in the industry	Policies that may prevent or support the introduction of hydrogen in industrial processes, substituting conventional methods/fossil fuels
6. General questions	Strategy and planning policies such as hydrogen roadmaps as well as various renewable electricity subsidy policies

This report presents an analytical overview of the currently gathered national policies data structured around the six above-mentioned chapters. This report summarises information on several key questions in each chapter, but it is not exhaustive as it does not address all the questions included in the Observatory. Each chapter introduces the sector and presents preliminary results based on gathered data. It focuses on key insights in each chapter that provide informational value about the proliferation and scale of policies impacting the various hydrogen sectors.

3.2. Methodology

National respondents

Given the diverse scope of the monitored policies, no single authority could provide the data required for the Observatory. As a result, **data collection at the national level** has been done by **an extensive team of national contributors**. Their unique knowledge, expertise, and language skills ensured an efficient data collection process. Contributors include governmental organizations such as national energy agencies, national hydrogen associations, research centres, ministries, and individual experts.

Respondents' answers have been revised by Hydrogen Europe for consistency and correctness. Given the changing nature of policies, **data is revised** on an annual basis for the duration of the project.

Technical background

The data collection process has been implemented, from a technical perspective with the support of the consortia's technological partner, Inycom. Drupal questionnaires and data storage in a SQL database format were used. The platform's interface is complemented with Tableau for automatic creation of maps and other visualizations.

3.3. Geographical Coverage

The geographical coverage of the National Policies part of the FCH Observatory includes 38 entities. These 38 entities are comprised of 37 countries and one sub-national unit, the State of California.[50]

As of writing of this report in March 2022, the FCH Observatory received responses from 34 out of the 38 entities.[51] As a result, **the data included online and in this report covers these 34 countries, 26 of which are members of the EU/EFTA/UK**.[52] Figure 4 visualizes the geographical coverage.

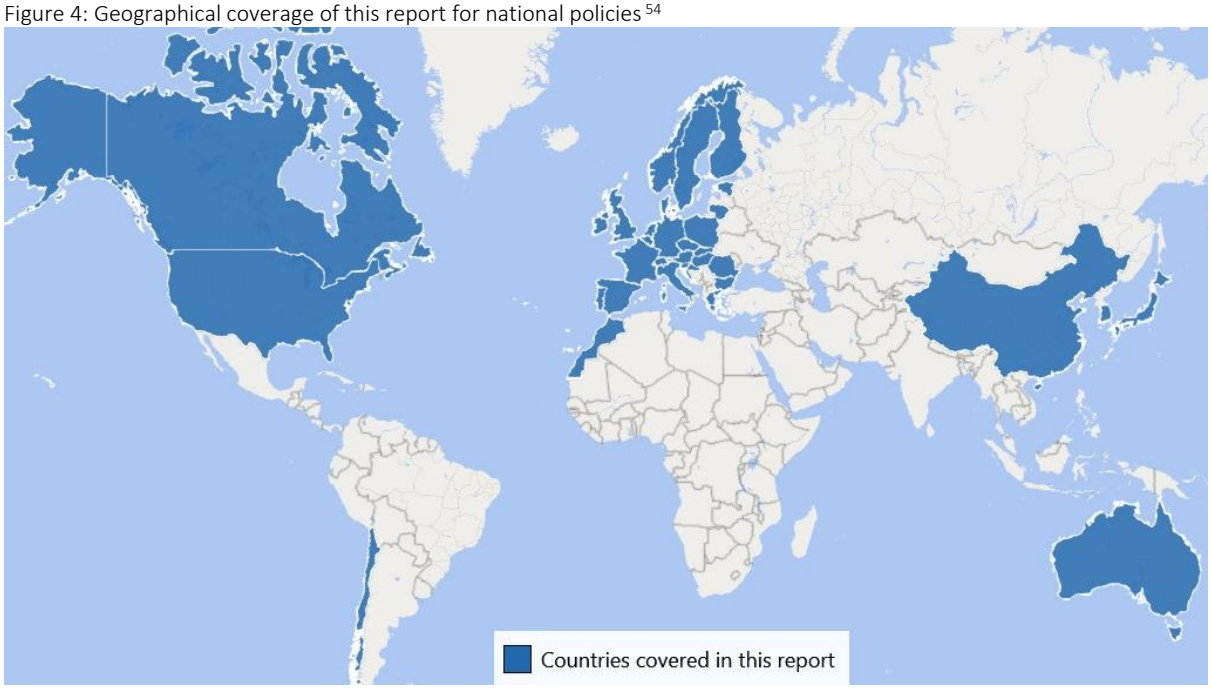
Since the hydrogen sector is developing with different objectives around the world due to countries' different demands, policies adopted to support its further development also differ widely. In view of these developments, it is important to cover not only EU members, but also other major economies focused on hydrogen development.[53]

We are confident that a more global policy coverage will:

- Allow for a more comprehensive analytical and comparative work given the inclusion of major economies.
- Increase the utilization and importance of FCH Observatory around the world.

[50] When this report refers to USA, its data is represented by the State of California.
[51] Data is unavailable for: Cyprus, Latvia, Luxembourg, and Malta. The entities for which data is only available from April 2020 and have not been updated as of writing of this report include Australia, China, Japan, Morocco. The entities for which data is only available from May 2021 and have not been updated as of writing of this report include Canada, Greece, and Ireland. Dutch data is updated and available online, but this report refers to Dutch 2021 data.
[52] The EU/EFTA/UK countries for which information is not available on the portal nor in this report include Cyprus, Latvia, Luxembourg, and Malta.
[53] Major non-EU/EFTA hydrogen economies already being tracked include Australia, Chile, China, Japan, and South Korea.

Figure 4: Geographical coverage of this report for national policies [54]



3.4. Fuel Cell Electric Vehicles

The chapter covering policies on Fuel Cell Electric Vehicles covers questions related to different means of FCEV support via six different policy categories.

Table 4: Main questions answered in the FCEV chapter

Fuel cell electric vehicles chapter questions (selection)
Is there a purchase subsidy offered to FCEVs?
Are there any registration tax benefits offered to FCEVs
Are there any ownership tax benefits offered to FCEVs
Are there any company tax benefits offered to FCEVs
Are there other financial benefits and/or subsidies offered to FCEVs?
Are there any non-economic benefits / incentives applicable to FCEV's?

The questionnaire sought to answer whether policies are in place, their economic value (in EUR or as % of the vehicle cost or tax due), which modes of transport they apply to (heavy-duty vehicles, passenger cars, boats etc.), and any other relevant details about the policy.

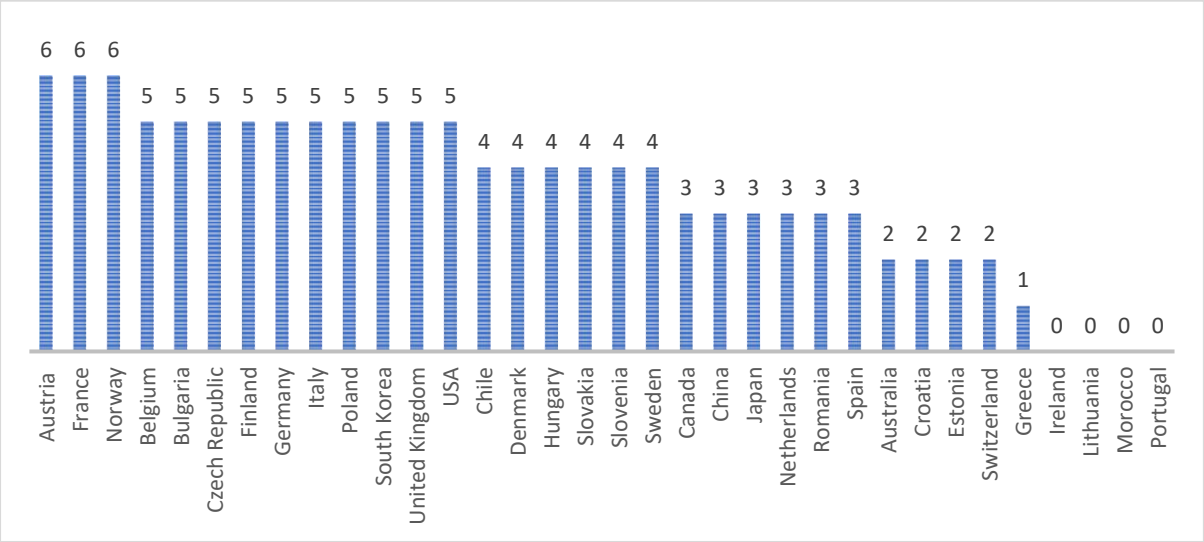
Policies for FCEVs are widespread among the surveyed countries. **30 out of the 34 countries** included in this survey have **at least one policy supporting FCEVs** with **25 of them having three or more policies** in place. For EU/EFTA/UK, 23 out of 26 countries have at least one policy and 19 countries have three or more FCEV policies.

As evident in Figure 5, **Austria, France, and Norway** have the **largest number of policies supporting FCEV** vehicles with all six financial and non-economic incentives in place. Countries with five policy categories include Belgium, Bulgaria, Czech Republic, Finland, Germany, Italy, Poland, South Korea, United Kingdom, and USA.

[54] Information for the United States of America is represented by California.

On the other end of the spectrum, **Ireland**, **Lithuania, Morocco, and Portugal** are the only countries with **no FCEV supporting policies** even though they all have at least some BEV support policy in place. In Portugal's case, BEV support includes exemption from annual road tax, purchase subsidy, deductible VAT for companies as well as some non-economic benefits such as access to bus lanes, free parking, and free circulation in some downtown areas.

Figure 5: Number of FCEV policies adopted, by country

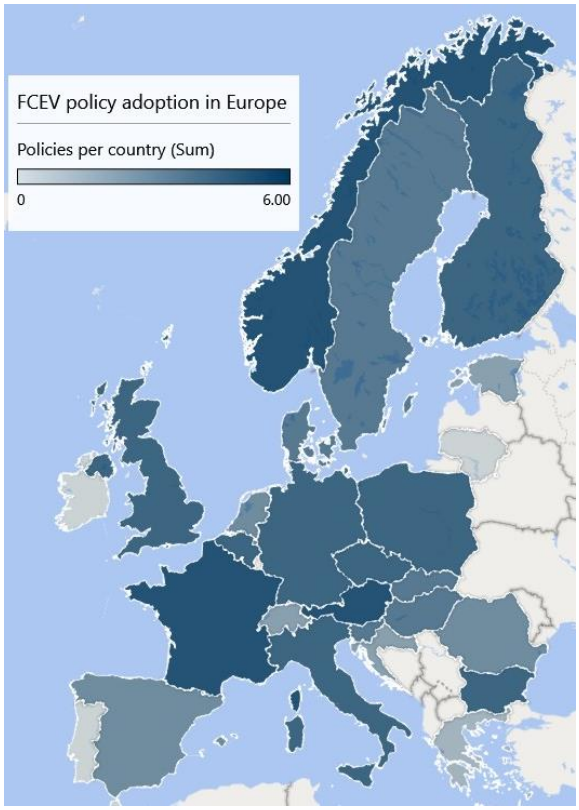


While various FCEV and BEV policies have been adopted across Europe, they are not equally represented as BEV policies continue to be more common. There are 12 EU/EFTA/UK countries in which there is a BEV policy that excludes FCEVs.[55]

The current adoption of FCEV policies in Europe based on Figure 6 does not suggest any geographical trend with all regions being represented among both the most and least supportive.

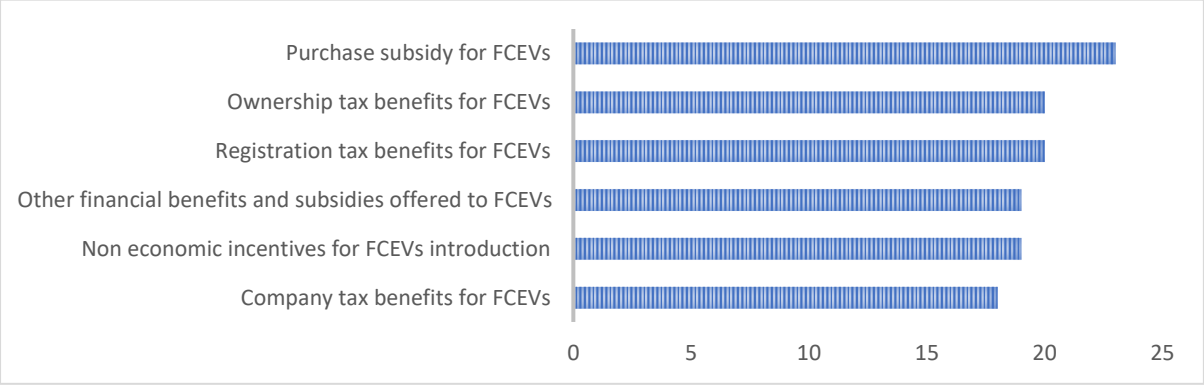
[55] Countries in which there is at least one policy intended to promote electric mobility that excludes FCEVs: Croatia, Finland, Germany, Hungary, Ireland, Italy, Lithuania, Netherlands, Norway, Portugal, Slovakia, Sweden.

Figure 6: Intensity of FCEV policy adoption in Europe



Considering all applications and modes of transport, the **most commonly implemented policies are purchase subsidies,** as they are present in **24 out of 34** countries, followed by ownership tax benefits and registration tax benefits in 20 countries.[56]

Figure 7: Number of countries that adopted one of the six measured FCEV policies



The structure and scale of the provided policy support vary widely among countries. Some countries use absolute values while others use percentages, but most of them limit their policy support up to a specific amount, especially in the case of purchase subsidies.

[56] Registration tax benefits are present in 16, purchase subsidies in 17, and ownership tax benefits in 18 out of the 26 EU/EFTA/UK countries included in this report.

The most common FCEV support policy are **purchase subsidies**. They are among the most common and well-known policy instruments for supporting emerging technologies as they decrease the capital investment and bridge the gap between the established and emerging technology.

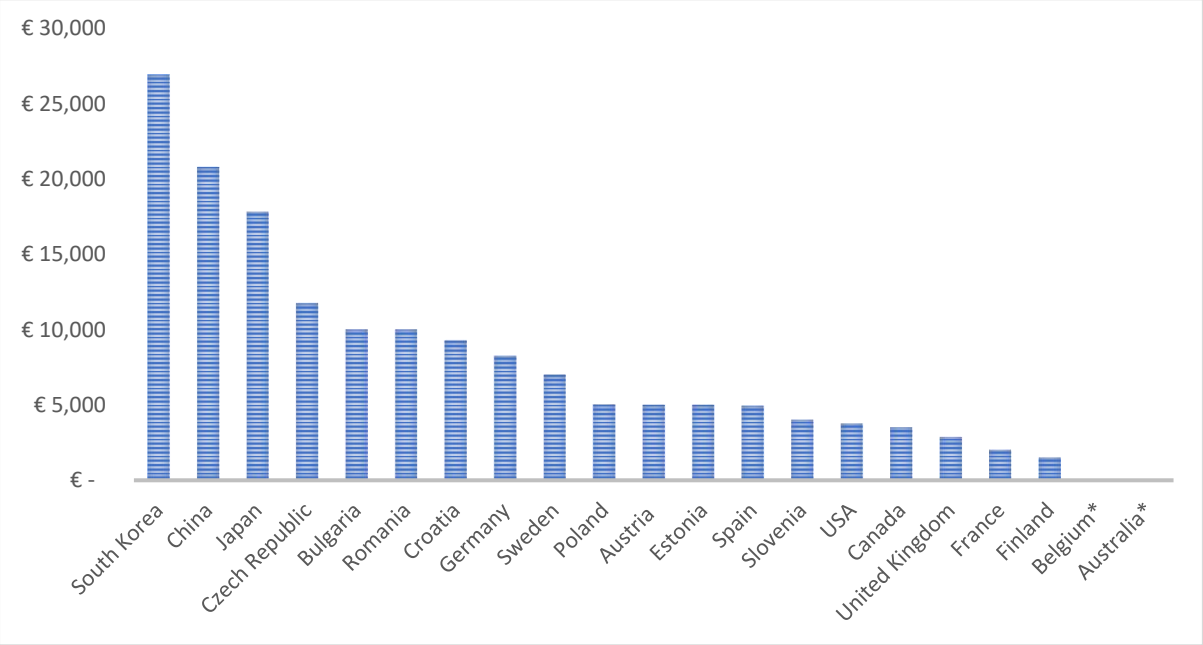
21 countries out of the 34 countries that are a part of this report currently have **purchase subsidies for passenger car FCEVs.**[57] All 21 of those countries also have equivalent purchase subsidies for passenger car BEVs. Countries **with purchase subsidies for BEVs but which exclude FCEVs include Finland, Hungary, Lithuania, and Portugal.**

The most common applications for **FCEV purchase subsidies** include **passenger cars in 21 countries, light-duty vehicles in 16 countries, buses and coaches in 19 countries, and heavy-duty vehicles in 16 countries**.

Figure 8 presents values of purchase subsidies for FCEV passenger cars.

These figures range from 26,950 EUR in South Korea to approximately 1,500 EUR in Finland. The absolute values are only indicative as in some countries, the subsidy can differ depending on the vehicle and additional conditions. Countries marked with an asterisk (*) have policies for which information in absolute numbers is not available.

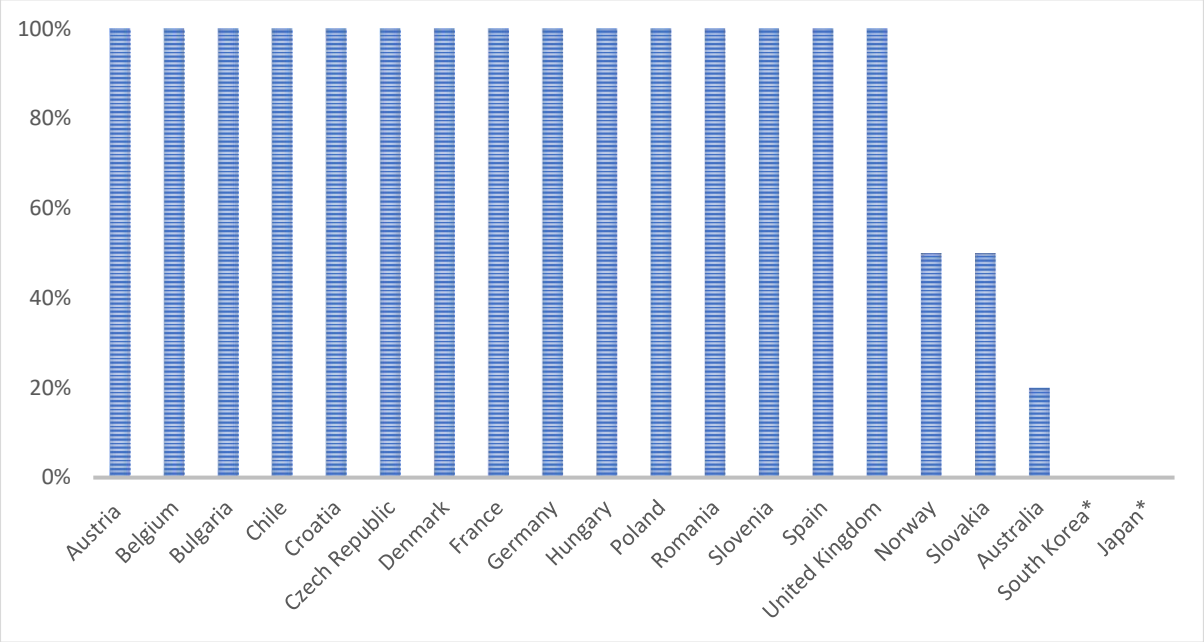
Figure 8: Overview of purchase subsidies for passenger cars across covered countries



Registration tax benefits for FCEVs are commonplace with 20 countries providing at least some registration tax benefit and 17 countries providing at least 50%. The three countries with registration tax benefits for battery and not fuel cell passenger cars are Netherland, Ireland, and Portugal. Figure 9 below provides an overview of registration tax benefit values for passenger FCEVs. Countries with * have policies with absolute values or other representations that cannot be displayed in Figure 9.[58]

[57] 16 out of 26 for EU/EFTA/UK.
[58] South Korea provides up to 4,892 EUR registration tax exemption. Japan also has registration tax benefit in place, but its value has yet to be determined.

Figure 9: Overview of % values of registration tax benefits for passenger cars across covered countries



Ownership tax benefits for passengers cars are in 20 countries. Belgium, Bulgaria, Denmark, France, Germany, Italy, Romania, and Slovenia have a 100% tax exemption of their various versions of ownership taxes. Slovakia provides 50% reduction of the annual tax. Finland's benefits amount to ~150 EUR annually, UK's to 166 EUR, South Korea's to 100 EUR, and Hungary's 60-110 EUR.

With fuel cell electric vehicle fleets being promoted to replace the current fleets of ICE vehicles, 16 countries provide **company tax benefits** for passenger cars. Slovenia offers tax base reduction equal to 40% of the vehicle's purchase price. The Netherlands allows for tax reduction equal to 36% of the purchase price. Germany provides 100% tax benefit/reduction on FCEV purchases.

Lastly, 14 countries currently provide **other economic benefits** which include not having to pay for tolls in the Czech Republic or a reduction of the tax that an employee has to pay for using an employer-owned car in Sweden and Austria.

19 countries also provide **non-economic benefits** such as free parking in Austria, Bulgaria, Czech Republic, Denmark, Germany, Hungary, Norway, Poland, Spain, and USA. Another common benefit is free access to restricted zones and exemptions from driving bans in France, Germany, Poland, and Spain which is especially relevant for light and heavy-duty trucks that will have to contend with these bans or restrictions in upcoming years.

3.5. Stationary Power

The stationary power chapter covers policy support for stationary fuel cells providing electricity and/or heat.

Table 5: Main questions answered in the stationary power chapter

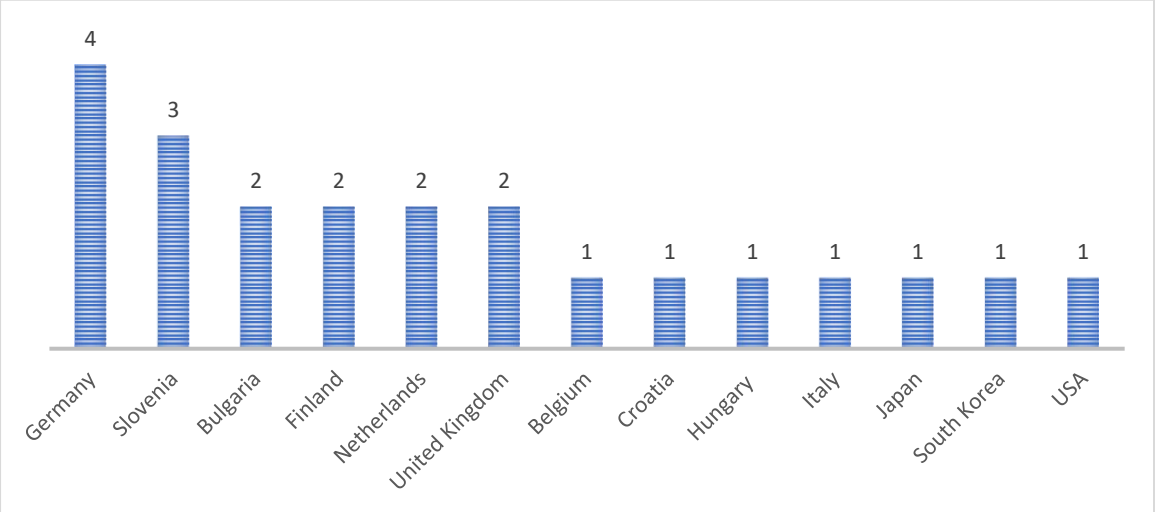
Stationary power chapter questions (selection)
Is there a purchase (CAPEX)[59] support offered to stationary fuel cell applications?
Are there feed-in tariffs for electricity generated by stationary fuel cell applications?
Are there feed-in premiums for electricity generated by stationary fuel cell applications?
Do tax incentives exist that might support the deployment of stationary fuel cell applications?

The questionnaire sought to answer whether the policies are in place, their economic value (in EUR or as % of the investment or tax due), which applications they apply to (CHP, non-CHP, gensets), and any other relevant details about the policy.

The chapter also explores whether similar support mechanisms are available for conventional stationary power applications.

Policy support for stationary power is less common compared to FCEV subsidies. Only **13 out of the 34 countries** included in the report have at least one policy in place.[60] The **leaders are Germany with four different policies**, followed by Slovenia with three policies.

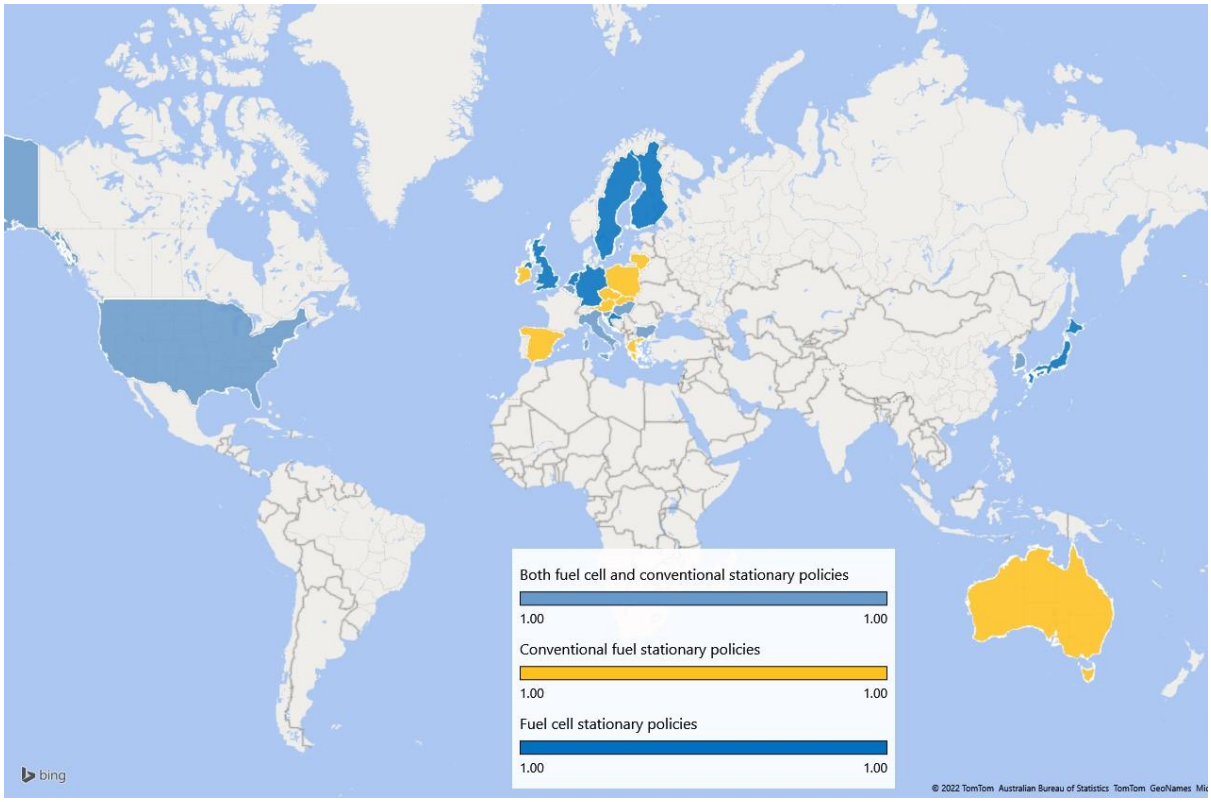
Figure 10: Number of stationary fuel cell policies adopted by country



As evidenced by Figure 10, there is no clear geographical distinction that would help explain the number of adopted policies in the surveyed countries. Figure 11 shows **nine countries,** in yellow, **with subsidies for conventional stationary power applications** that lack stationary fuel cell subsidies. There are also seven countries with stationary fuel cell policies in dark blue and seven countries with both fuel cell and conventional stationary power policies in light blue.

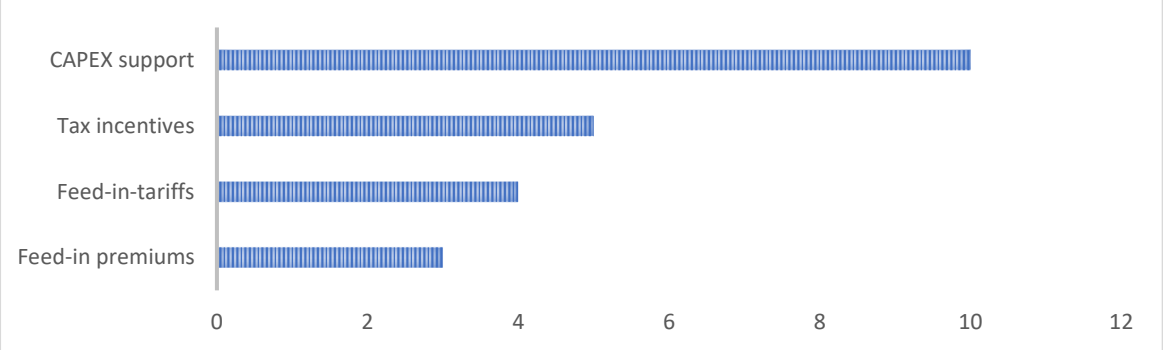
[59] CAPEX refers to Capital Expenditure.
[60] For EU/EFTA/UK, it is 10 out of 26 countries.

Figure 11: Geographical coverage of fuel cell and conventional stationary power subsidies



According to Figure 12, the **most common** stationary power policy is **CAPEX support**, available in ten countries followed by **tax incentives** in five countries.

Figure 12: Number of countries that adopted one of the four measured stationary power policies



CAPEX support is one of the most common and well-known policy instrument. It decreases the necessary capital investment thus reducing the difference between the established and emerging technology.

Ten countries out of the 34 that are a part of this report currently have **CAPEX support for stationary fuel cell power applications**. These include Belgium, Bulgaria, Finland, Germany, Italy, Japan, Netherlands, South Korea, United Kingdom, and USA. Out of the 34, **nine have CAPEX support policies for conventional stationary power technologies, but not fuel cell technologies**. These include Australia, Austria, Czech Republic, Greece, Ireland, Lithuania, Poland, Slovakia, and Spain.

3.6. Hydrogen as Fuel and Hydrogen Refuelling Infrastructure

The hydrogen as fuel and hydrogen refuelling infrastructure chapter covers various policy instruments used to promote the build-up of refuelling infrastructure and the use of hydrogen as a fuel.

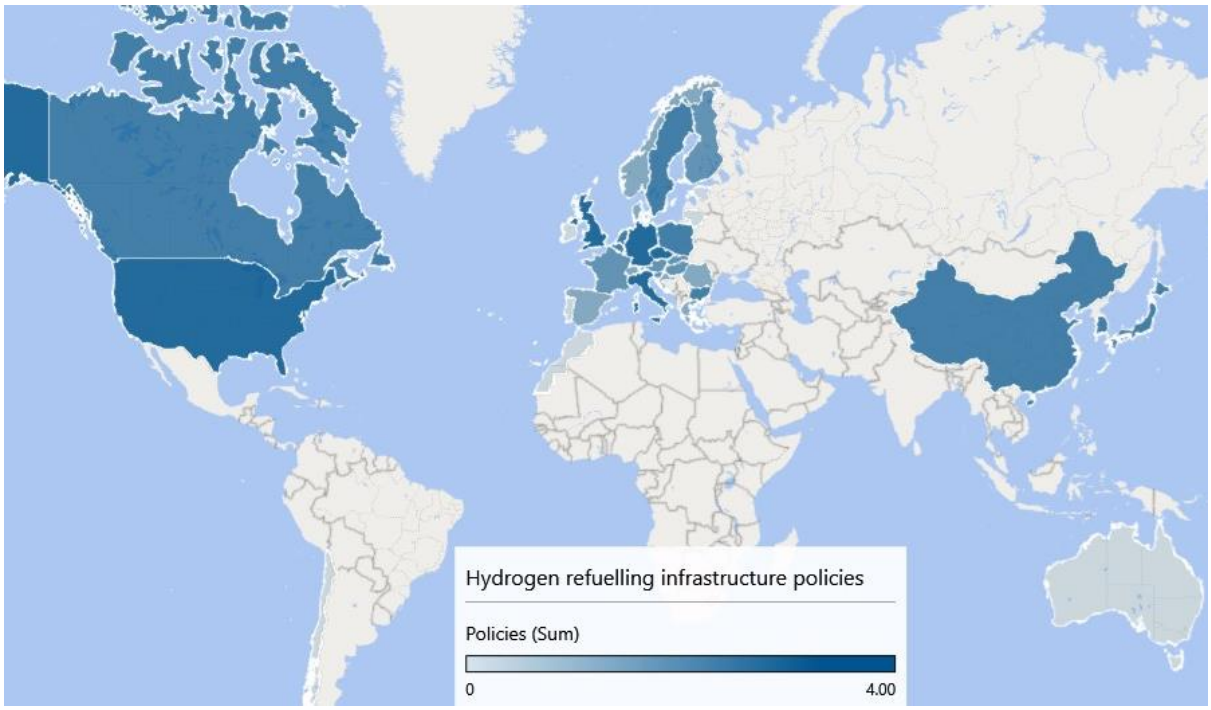
Table 6: Main questions answered in the hydrogen as fuel and hydrogen refuelling infrastructure chapter

Hydrogen as fuel and hydrogen refuelling infrastructure chapter questions (selection)
Is there any CAPEX support offered for HRSs in your country?
Is hydrogen used as fuel taxed in your country?
Are there any mandates / obligations in place requiring the construction of HRSs?
Are there clear rules or guidelines in place that cover permitting of HRS?
Are there any other policies (e.g. incentives or obligations) that support or inhibit the development of HRS in your country?

The questionnaire sought to answer whether the policies are in place, their economic value and any other relevant details about the policy.

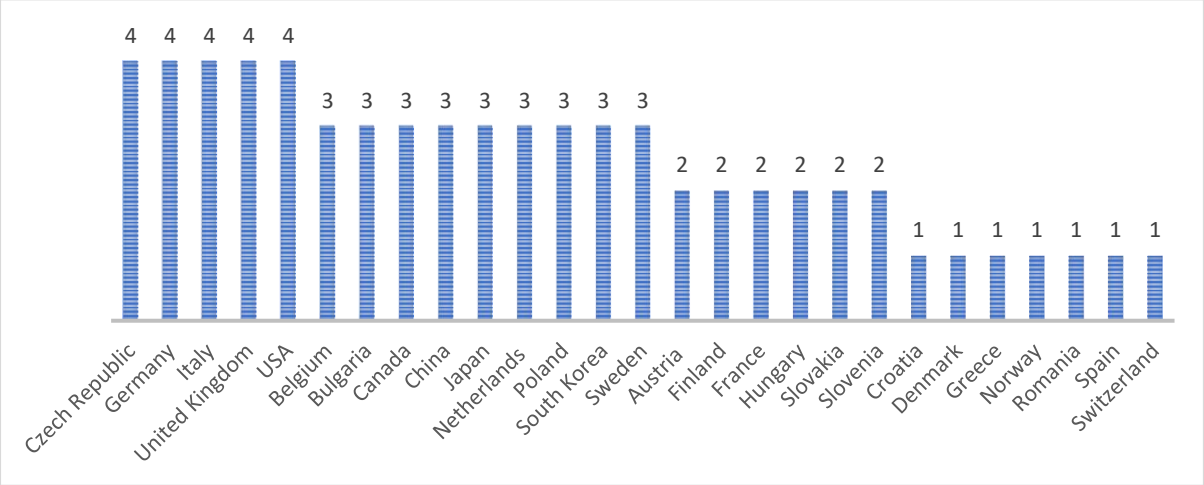
Figure 13 and Figure 14 provide an overview of countries with the most and least ambitious refuelling support policies with **Czech Republic, Germany, Italy, United Kingdom, and USA** having **adopted four different policies**.

Figure 13: Geographical coverage and intensity of subsidies for hydrogen refuelling infrastructure



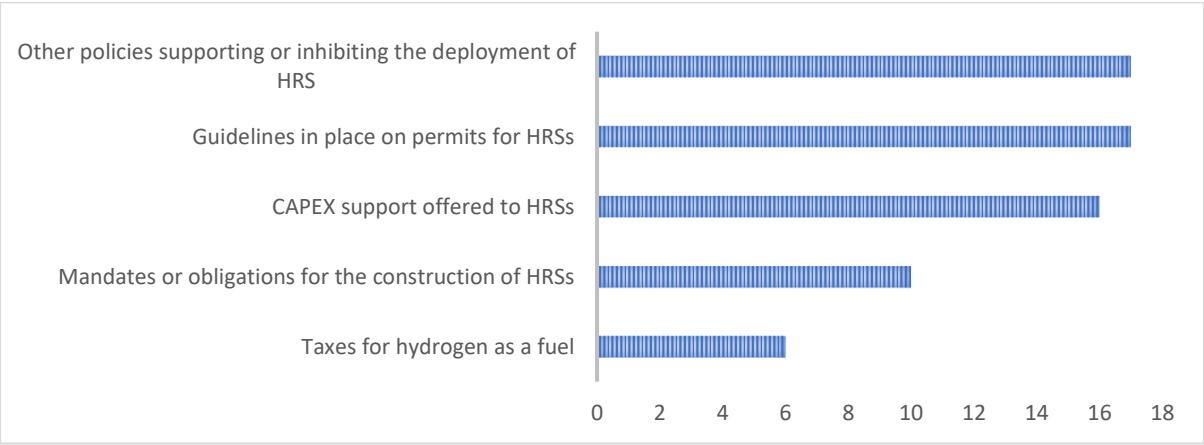
Nine countries have three policies in place including Belgium, Bulgaria, Canada, China, Japan, Netherlands, Poland, South Korea, Sweden.

Figure 14: Number of hydrogen refuelling infrastructure policies adopted by country



The **most common refuelling infrastructure policies** include **permitting guidelines for HRS in 17 countries**, **other policies supporting HRS deployments in 17 countries,** and **CAPEX support in 16 countries**.[61]

Figure 15: Number of countries that have adopted one of the five measured hydrogen as a fuel and refuelling infrastructure policies



Six countries tax hydrogen as fuel (Austria, Canada, Poland, Slovenia, United Kingdom, USA). Poland taxes it at 0.04 EUR/kg. In Austria, hydrogen used as a fuel is treated the same as natural gas and taxed at 0.021 EUR/m3. France, Finland, Hungary, Slovenia, and the United Kingdom are planning to introduce or revise their hydrogen fuel taxation. This is the least common policy in this category.

The **other policies provided by survey respondents cover a wide range of government and industry initiatives.** Belgian companies can benefit from additional tax investment deductions when installing HRS. Slovakia is planning to introduce various incentives for HRS development to achieve the HRS targets of its Alternative fuel action plan. In Germany, companies created an industry initiative, H2 MOBILITY, whose primary task is the establishment of a nationwide infrastructure for hydrogen mobility. South Korea provides operational subsidies to cover up to 80% of HRS' operational losses. Currently, the Swedish government policy requires fuel stations that sell over 1000 m^3 of petrol or diesel to provide at least one alternative fuel. This requirement is currently most commonly satisfied with E85,

[61] Permitting guidelines are present in 13, capex support in 11, and other policies in 14 out of the 26 EU/EFTA/UK countries measured in this report.

but could also incentivize HRS deployment in the future. In the Netherlands, quantitative risk analysis necessary for HRS installation is being developed that will simplify the safety guidelines and thus overall HRS deployment. In many countries, the respondents have identified the lack of guidelines and rules as inhibiting further HRS development in their countries.

3.7. Hydrogen Production, Transmission, and Distribution

This chapter covers policies that support the production of hydrogen, its transmission, and distribution. Policies providing funding for hydrogen production could significantly contribute to scaling-up of the emerging electrolytic and low-carbon hydrogen production markets. Policies covering transmission and distribution of hydrogen in either the natural gas network or in dedicated hydrogen infrastructure are also covered by the chapter.

Table 7: Main questions answered in the hydrogen production, transmission, and distribution chapter

Hydrogen production, transmission, and distribution chapter questions (selection)
Is there any CAPEX support for renewable/low-carbon hydrogen production plants?
Is there any OPEX support (e.g. in the form of carbon contract for difference or any other form of OPEX support) for renewable/low-carbon hydrogen production plants?
Is there any exemption from or reduction of certain electricity price components for the electricity used for the production of renewable/low-carbon hydrogen?
Is there any feed-in tariff for hydrogen when injected into the gas grid?
Is there a feed-in premium for hydrogen when injected into the gas grid?
Are there any exemptions from or reduction of gas network fees and tariffs for hydrogen injected into the gas grid?
Is there a legal hydrogen concentration limit into the gas grid?

The policies supporting production, transmission, and distribution of hydrogen are less prevalent than policies in other sectors, such as transport.

The most common ones are **CAPEX subsidies** with 14 countries providing subsidies in some form for renewable or low-carbon hydrogen production plants.[62] These funding sources are implemented through different instruments. In California/USA, there are regular grant funding opportunities published by the California Energy Commission. Under its National Recovery and Resilience Plan, Bulgaria plans to support renewable hydrogen production with up to 50% of CAPEX support. Chile has a subsidy scheme for electrolysers over 10 MW. In Austria, hydrogen production plants continue to be eligible for funding from Kommunalkredit Public Consulting. In Belgium, the Flemish government includes support for renewable or low-carbon hydrogen production through its "Strategische ecologiesteun" and supports 20% to 40% of the required CAPEX for projects with minimal investment costs of three million EUR. In Sweden, hydrogen production projects can get funding through "Industriklivet" initiative aimed at reducing emissions from industrial production. In Finland, projects introducing new low carbon technology, including electrolysers can receive up to 40% of investment subsidy with specific amount to be decided on a case-by-case basis. France is planning a CAPEX and OPEX support mechanism for hydrogen production plants.

[62] Nine of those are in EU/EFTA/UK.

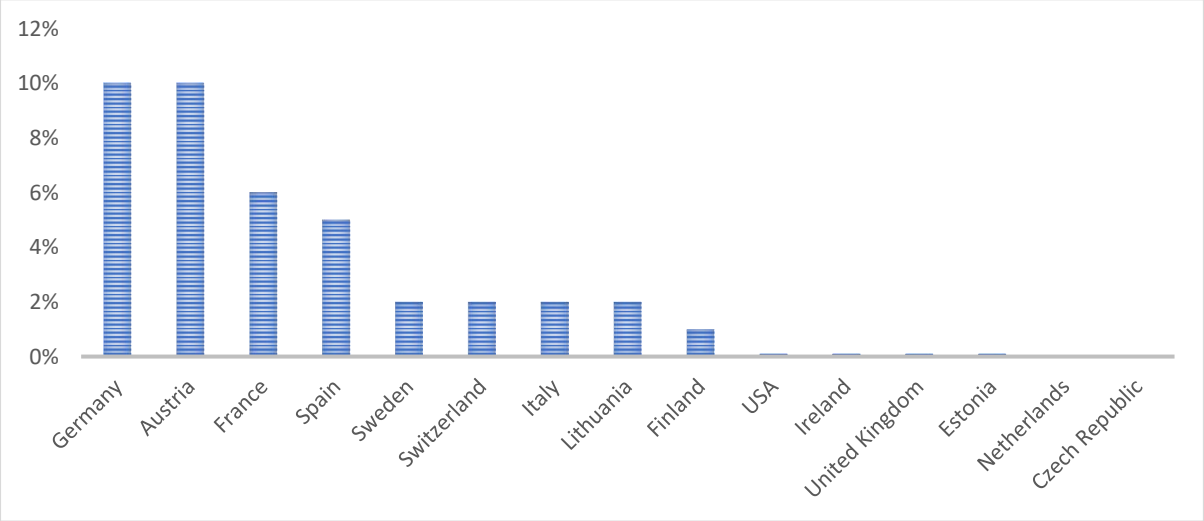
There are five countries with some form of an **exemption from or reduction of electricity price components when producing hydrogen**. In Sweden, all electrolytic processes, including electrolytic hydrogen production, are exempt from electricity tax. In Denmark, as a part of energy tax deductions, electricity for hydrogen production is exempted from taxation. In Germany, under the German Renewable Energy Sources Act (EEG) 2021, the EEG levy for electricity consumed by a company to produce green hydrogen, regardless of its intended use, will be reduced to zero. In case of use of grid electricity with guarantees of origin, electrolysers are exempt from grid charges under the Energy Industry Act. In France, electrolytic processes are exempted from the domestic tax on final consumption. In addition, consumers with a stable or counter-cyclical consumption profile can benefit from a tariff reduction for use of the public electricity network (TURPE). The reduction cannot exceed 90%, the consumption point must have utilization of at least 7000 hours/year and/or minimum rate of use in off-peak of at least 44%.

Nine countries (Czech Republic, Denmark, Estonia, France, Italy, Netherlands, Sweden, UK, and the USA) currently provide tariffs or premiums for the injection of biogas or synthetic methane into the gas grid. While excluding hydrogen for now, these existing policies provide an opportunity for hydrogen to be included.

Germany, in an effort to incentivize hydrogen injection into the gas grid, provides renewable hydrogen and synthetic methane with the same incentives as for biogas. This includes being exempt from gas grid connection fees.

In terms of non-financial policies, the most common policy is a **hydrogen concentration limit in the gas grid**. The acceptable H2 limits vary from country to country and **range from 0% in the Czech Republic, 0.1% in the United Kingdom to 5% in Spain, and 10% in Germany. Some countries have already set a legal limit, while others only have recommended levels by their system operators or regulators.**

Figure 16: Countries with available limits on hydrogen concentration in their gas grids[63]



Another supporting policy is **guarantees of origin** (GoO) for renewable hydrogen. These have been or are in the process of being established in **Austria, Flanders Belgium, Finland, France, South Korea, and the United Kingdom**. Similar to GoO in renewable electricity production, they provide potential buyers with certainty that the hydrogen was produced from renewable sources.

[63] Non-graphically represented values include Ireland (0.1%), Estonia (0.1%), United Kingdom (0.1%), Netherlands (TSO 0.02%, DSO 0.5%), USA (0.1%) and Czech Republic (0%).

3.8. Hydrogen in Industry

Even though hydrogen has been used in the industry for decades, the future use of renewable or low-carbon hydrogen for heat, as a feedstock, or as a chemical agent are some of its most promising use cases. This chapter of the Observatory explores policies supporting increased usage of clean hydrogen in industry.

Table 8: Main questions answered in the hydrogen in the industry chapter

Hydrogen in the industry chapter questions (selection)
Are there any CAPEX subsidies for renewable/low-carbon hydrogen production plants used in industry and aimed at decarbonizing / reducing emissions for industry?
Is there any national funding for low-carbon demonstration projects in industry which involve the use of renewable or low carbon hydrogen?

The questionnaire sought to answer whether the policies are in place, what is their economic value, and any other relevant details about the policy.

The most common policies are **low-carbon hydrogen demonstration subsidies**. These exist in **19** of the 34 surveyed countries and provide funding for hydrogen demonstration projects.[64] Countries with relevant support include Australia, Austria, Belgium, Bulgaria, Chile, Denmark, Finland, France, Germany, Lithuania, Netherlands, Norway, Portugal, Slovenia, South Korea, Spain, Sweden, Switzerland, and the United Kingdom.

Denmark's funding is available through the Danish Energy Agency. **Chile** supports industrial demonstration projects using hydrogen. **Finland** includes hydrogen demonstrations under its **Energy Aid** program providing a wide range of funding to various projects and technologies under specific conditions. **Austria** covers **40%** of environmentally relevant additional investment costs which includes hydrogen projects. In **Norway**, the national research agency Enova provides grants for demonstration projects in industry including hydrogen. **Portugal** is planning to provide funding for hydrogen production demonstration projects in industry.

CAPEX subsidies for renewable/low carbon non-demonstration hydrogen production projects used in industry are in effect in **six countries Austria, Belgium, Bulgaria, Finland, Germany, and the Netherlands. Austria** provides funding for producing gas from electricity via electrolysers of up to 45% of the investment costs. The selected projects are also exempted from grid provision fees. **The Flemish government in Belgium covers 20 to 40% of the involved capital expenditure** with a maximum of 1 million EUR through its Ecology bonus Flanders program. This is a financial subsidy for SMEs and large companies to encourage them to make their processes more environmentally friendly and energy efficient. Finland's Energy Aid program provides up to 40% of the initial investment to new technologies and demonstration projects that achieve a reduction of greenhouse gas emissions and/or energy savings. The **Netherlands's Energy Investment Allowance provides tax deductions up to 45% of the investment** under certain conditions.

3.9. Hydrogen Roadmaps and Strategies

Hydrogen roadmaps and strategies are relatively commonplace among the surveyed countries with **19 countries**, displayed in Figure 17, having **national hydrogen roadmaps or strategies.**[65]

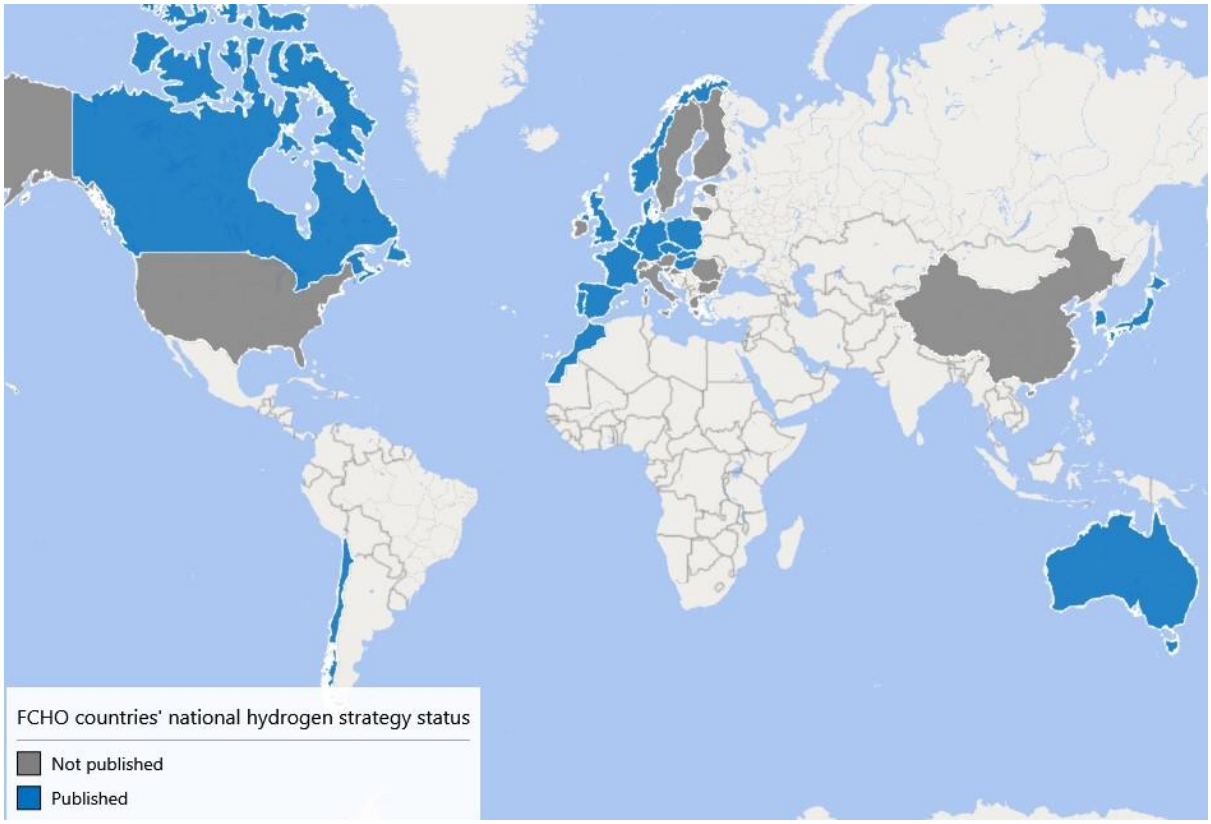
[64] 16 out of 26 for EU/EFTA/UK countries.
[65] Out of these 12 countries, EU/EFTA/UK countries are Belgium, Czech Republic, Denmark, France, Germany, Hungary, Netherlands, Norway, Poland, Portugal, Slovakia, Spain, and the United Kingdom. Others include Australia, Canada, Chile, Japan, Morocco, South Korea.

Danish national strategy published in March 2022 identifies 4-6 GW of water electrolytic capacity by 2030. Belgian national strategy from 2021 identified an ambition of 150 MW of water electrolytic capacity by 2025. The Czech strategy identifies low-carbon hydrogen production of 100 thousand tonnes by 2030 which roughly equals to its current annual hydrogen consumption. The United Kingdom's long-awaited strategy published in summer 2021 identifies funding for both hydrogen production and end-uses. Germany's 2020 strategy identified 9 bn EUR of spending on hydrogen technologies and related international cooperation. In 2022, it was announced that there will be an increased ambition, including an increase of the target for installed electrolysis capacity by 2030 from 5 GW to 10 GW. The Spanish strategy set 4 GW electrolysis capacity target and identified 8.9 bn EUR of spending from both private and public sector. The Dutch Government Strategy on Hydrogen outlines the historical role of the Netherlands as an energy hub, stresses the future importance of renewable gases in the future energy system with hydrogen at its core, and aims to for 3 GW of electrolysis capacity by 2030.

From outside of Europe, Chile's hydrogen strategy aims to develop 25-40 GW of electrolysis capacity by 2030 and mobilize 8 bn USD from public and private funding sources by 2025.

In addition to the already adopted strategies, numerous strategies are in various stages of development of their strategies. These include, among others, Austria, Bulgaria, Croatia, Estonia, Greece, Italy, Lithuania, Romania, Sweden, and Switzerland.

Figure 17: FCHO countries with national strategies in place



4. Conclusion

The global discussion on hydrogen has changed significantly since September 2020 when the FCHO published its first set of reports. The EU hydrogen strategy was published in July 2020 and the first European countries were publishing their national hydrogen strategies in the spring and summer of 2020.

As the first FCHO policies report from September 2020 reported, numerous countries already had policies supporting fuel cells and hydrogen. The most support existed in the most mature areas of the value chain that are being commercially deployed such as mobility and increasingly production and industrial end-use.

As the hydrogen ecosystem will continue to mature, one can expect further policy developments all across the supply chain in the sectors where FCH technologies are being deployed. That will concern various technical regulations for operating new hydrogen infrastructure, but also incentives, the focus of this report. Additional policies as well as technical regulations in production, transmission and distribution, storage, and the various end-uses are being prepared on both European and national levels.

National

This year, there are 19 countries covered by this report that have a national hydrogen roadmap or strategy compared to 12 countries with national or regional roadmaps last year. That clearly reflects the increasing interest in hydrogen as one of the solutions to decarbonize Europe.

The most popular policies on the national level are those supporting use of hydrogen and fuel cells in mobility as 31 out of 34 countries had at least one supporting policy. Countries have different tax treatments of vehicles and thus different policy schemes to promote zero emission vehicles such as FCEVs. The collected data shows the most commonly implemented supporting policies are purchase subsidies, registration tax benefits, and ownership tax benefits.

Coupled with the FCEV fleet deployments are actions supporting the build-up of hydrogen refuelling infrastructure where 27 countries had at least one policy. The most common ones promoting hydrogen refuelling infrastructure are permitting guidelines and CAPEX support for HRS. In addition to specifying technical standards for HRS development, countries are devising different financing models to develop their hydrogen refuelling infrastructure.

Support for fuel cells used for stationary power (or CHP) is mostly centred around CAPEX support and tax incentives. Most of the current supporting mechanisms are designed for incentivizing other renewable sources of heating or electricity, as fuel cell technology matures and nears being ready for mass market deployment, however, these mechanisms are slowly being revised to specifically include the use of fuel cells for generating electricity or CHP.

Funding for the use of low-carbon or renewable hydrogen in industry is currently mostly focused on CAPEX subsidies for industrial consumers of hydrogen to consider switching to renewable/low-carbon hydrogen or incentivizing the industry to use hydrogen instead of another energy source. The governments together with industry are also exploring other policy mechanisms besides CAPEX support.

Most of the available assistance for renewable or low-carbon hydrogen production is available as CAPEX subsidies, but governments and industry are also investigating more OPEX focused policies. Some

countries have already proposed or begun exploring various OPEX measures from direct OPEX subsidies to exemptions from electricity network costs or various electricity surcharges.

European

The development of the EU hydrogen policy originates in the European Green Deal's goal to achieve climate neutrality by 2050. The main document is the European Hydrogen Strategy which lays down the Commission's vision of hydrogen as an energy carrier in an integrated European energy system. It envisions hydrogen acting as a carbon-neutral energy carrier, enabling seasonal storage, facilitating the substitution of fossil fuels in carbon-intensive industrial processes, and accelerating the decarbonisation of hard-to-abate sectors. The strategy's targets were further increased by the RePowerEU communication, aiming to achieve 20.6 million tonnes (mt) of renewable hydrogen by 2030 (5.6 mt under the Fit for 55, 10 mt imported and another 5 mt produced in Europe).

These policy developments are followed by an extensive legislative revision, taking place under the Fit for 55 and the Hydrogen and Decarbonised Gas Market packages. The Commission is aiming to establish a proper regulatory framework for hydrogen while facilitating hydrogen deployment, stimulating demand, and incentivizing investment in hydrogen technologies across the entire value chain. These legislative efforts are expected to intensify further with the higher RePower ambitions.

Annex 1 – List of EU policies and legislation

EU Policies	Status
Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: **The European Green Deal** COM(2019) 640 final	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and social Committee and the Committee of the Regions: Powering a climate-neutral economy: **An EU Strategy for Energy System Integration** (COM(2020) 299 final	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: **A hydrogen strategy for a climate-neutral Europe** COM(2020) 301 final	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An EU **Strategy to harness the potential of offshore renewable energy** for a climate neutral future COM(2020) 741 final	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: A **Renovation Wave** for Europe - greening our buildings, creating jobs, improving lives COM(2020) 662 final	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: **Sustainable and Smart Mobility Strategy** – putting European transport on track for the future COM(2020) 789 final	Published
Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions: **A New Industrial Strategy for Europe** COM(2020) 102 final	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: Updating the 2020 **New Industrial Strategy**: Building a stronger Single Market for Europe's recovery COM(2021) 350 final	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: **'Fit for 55'**: delivering the EU's 2030 Climate Target on the way to climate neutrality COM(2021) 550 final	Published
Communication from the Commission: Criteria for the analysis of the compatibility with the internal market of State aid to promote the execution of **important projects of common European interest** (2021/C 528/02)	Published
Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: An **EU Strategy on Standardisation**: Setting global standards in support of a resilient, green and digital EU single market COM(2022) 31 final	Published
Communication from the Commission: **Guidelines on State aid for climate, environmental protection and energy** 2022 (2022/C 80/01)	Published
Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee	Published

and the Committee of the Regions: **REPowerEU**: Joint European Action for more affordable, secure and sustainable energy COM(2022) 108 final	
EU legislation	
Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('**European Climate Law**')	Adopted
Regulation (EU) 2019/1242 of the European Parliament and of the Council of 20 June 2019 setting **CO2 emission performance standards for new heavy-duty vehicles** and amending Regulations (EC) No 595/2009 and (EU) 2018/956 of the European Parliament and of the Council and Council Directive 96/53/EC	Adopted
Regulation (EU) 2019/631 of the European Parliament and of the Council of 17 April 2019 setting **CO2 emission performance standards for new passenger cars and for new light commercial vehicles**, and repealing Regulations (EC) No 443/2009 and (EU) No 510/2011 (recast)	Adopted,under revision
Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on **binding annual greenhouse gas emission reductions by Member States from 2021 to 2030** contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 (Text with EEA relevance)	Adopted, under revision
Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for **trans-European energy infrastructure** and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009	Adopted, under revision
Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the **trans-European transport network** and repealing Decision No 661/2010/EU	Adopted, under revision
Regulation (EU) 2020/852 of the European Parliament and of the Council of 18 June 2020 on the establishment of a **framework to facilitate sustainable investment**, and amending Regulation (EU) 2019/2088	Adopted
Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on **conditions for access to the natural gas transmission networks** and repealing Regulation (EC) No 1775/2005	Adopted, under review
Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the **Governance of the Energy Union and Climate Action**, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council, available at WWW	Adopted
Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning **common rules for the internal market in natural gas** and repealing Directive 2003/55/EC	Adopted, under review
Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of **energy from renewable sources** (recast)	Adopted, under revision
Directive 2014/94/EU of the European Parliament and of the Council of 22 October 2014 on the deployment of **alternative fuels infrastructure**	Adopted, under revision, to become a regulation

Directive 2010/31/EU of the European Parliament and of the Council of 19 May 2010 on the **energy performance of buildings** (recast)	Adopted, under revision
Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on **energy efficiency**, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC	Adopted, under revision
Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the **taxation of energy products and electricity**	Adopted, under revision
Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing **a system for greenhouse gas emission allowance trading** within the Union and amending Council Directive 96/61/EC	Adopted, under revision
Directive 2009/33/EC of the European Parliament and of the Council of 23 April 2009 on the **promotion of clean road transport vehicles** in support of low-emission mobility	Adopted
Commission Delegated Regulation (EU) 2019/856 of 26 February 2019 supplementing Directive 2003/87/EC of the European Parliament and of the Council with regard to the operation of the **Innovation Fund** (Text with EEA relevance.)	Adopted
Commission Regulation (EU) No 651/2014 of 17 June 2014 declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty **(GBER)**	Adopted, under revision
Commission Delegated Regulation (EU) 2021/2139 of 4 June 2021 supplementing Regulation (EU) 2020/852 of the European Parliament and of the Council by establishing **the technical screening criteria for determining the conditions under which an economic activity qualifies as contributing substantially to climate change mitigation or climate change adaptation** and for determining whether that economic activity causes no significant harm to any of the other environmental objectives	Adopted
COMMISSION DELEGATED REGULATION (EU) /... amending Delegated Regulation (EU) 2021/2139 as regards **economic activities in certain energy sectors** and Delegated Regulation (EU) 2021/2178 as regards specific public disclosures for those economic activities	Published, awaiting publication in Official Journal
Proposal for a Regulation of the European Parliament and of the Council on ensuring a level playing field for **sustainable air transport** COM(2021) 561 final	Proposal
Proposal for a Regulation of the European Parliament and of the Council establishing a **carbon border adjustment mechanism** COM(2021) 564 final	Proposal
Proposal for a Directive of the European Parliament and of the Council amending Directive 2003/87/EC as regards **aviation's contribution to the Union's economy-wide emission reduction target** and appropriately implementing a global market-based measure COM/2021/552 final	Proposal
Proposal for a Regulation of the European Parliament and of the Council on the **use of renewable and low-carbon fuels in maritime transport** and amending Directive 2009/16/EC COM(2021) 562 final	Proposal

Acknowledgement

National contributors:

EU COUNTRIES	
Austria	Austrian Energy Agency
Belgium	WaterstofNet vzw
Bulgaria	Bulgarian Hydrogen, Fuel Cell, and Energy Storage Association
Croatia	University of Split
Czech Republic	HYTEP
Denmark	BrintBranchen
Estonia	Estonian Hydrogen Association
Finland	VTT Technical Research Centre of Finland LTD
France	AFHYPAC
Germany	German Hydrogen and Fuel Cell Association (DWV)
Greece	National Centre for Scientific Research "Demokritos"
Hungary	Hungarian Hydrogen & Fuel Cell Association
Ireland	Hydrogen Ireland / Sustainable Energy Authority of Ireland
Italy	Italian Hydrogen and Fuel Cell Association
Lithuania	Lithuanian Hydrogen Energy Association
Netherlands	NEN
Poland	Institute of Power Engineering
Portugal	Aragon Hydrogen Foundation
Romania	Romanian Association for Hydrogen Energy
Slovakia	Slovak National Association
Slovenia	Energy Agency of Savinjska, Šaleška and Koroška region
Spain	Aragon Hydrogen Foundation
Sweden	Hydrogen Sweden
ASSOCIATED COUNTRIES	
Norway	Norwegian Hydrogen Forum
Switzerland	Swiss Federal Office of Energy
Non-EU/EFTA COUNTRIES	
Australia	Hydrogen Mobility Australia and the Government of Western Australia
California/United States of America	California Hydrogen Business Council and California Fuel Cell Partnership
Canada	CHFCA-Canadian Hydrogen and Fuel Cell Association
Chile	Chilean Hydrogen Association
China	Hack Heyward
Japan	New Energy and Industrial Technology Development Organization and Japan Electrical Manufacturers' Association
Morocco	Adil GAOUI, AMHID
South Korea	H2Korea
United Kingdom	UK Hydrogen and Fuel Cell Association