



Interreg
North Sea



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LIHYP

D3.1 – Mapping of relevant legislation and regulation

Hydrogen and Power-to-X in the North Sea Region

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Summary

The report provides a structured mapping of relevant EU, national, and regional legislation impacting hydrogen and Power-to-X (PtX) development within the LiHyp project framework.

- **Scope & Purpose:**

The mapping connects project activities (H2 platform, pilots, transport) with legislative frameworks to give partners an overview of regulatory and standardisation conditions. It serves as a foundation for the upcoming “Gap Analysis Report” D3.2

- **EU level:**

Key frameworks include:

- **ETS (Emission Trading System):** Integrates green hydrogen into carbon pricing, reducing cost gaps with fossil fuels.
- **REDIII (Renewable Energy Directive III):** Mandates 42.5% renewable share by 2030, with specific hydrogen quotas (42% RFNBO hydrogen in industry by 2030, 60% by 2035).
- **H2 and Gas Package:** Establishes a regulated hydrogen/gas market, supporting infrastructure and tariff rules.
- **ENNOH & ACER:** New governance and planning structures for EU-wide hydrogen networks.

- **National Level:**

The report outlines legislation, funding schemes, and strategies across multiple countries (Belgium, Denmark, France, Germany, Netherlands).

- **Belgium:** National hydrogen law, regional subsidies, tax exemptions, and BAT studies for hydrogen refuelling stations.
- **Denmark:** Strong PtX strategy (4-6 GW electrolysis by 2030), national tenders, Energinet/Evida hydrogen infrastructure development, and integration with EU backbone.
- **France:** National hydrogen strategies (2020, revised 2025), extensive regulatory framework for production, storage, distribution, retrofitting, and financial/tax incentives.
- **Germany:** National hydrogen strategies (2020, 2023 update), draft hydrogen grid law, green hydrogen definitions, and regulation of network tariffs.
- **Netherlands:** Innovation-focused funding schemes (DEI+, SDE++, NPG) and EU co-funded Interreg projects.

Introduction

The transition to a low-carbon economy is accelerating across Europe, and hydrogen is emerging as a key energy carrier to enable deep decarbonisation in industry, transport, and energy systems. Within this context, the **LIHYP project** aims to strengthen the hydrogen economy in the North Sea Region by developing pilot activities, digital platforms, and cross-border collaboration. Achieving these goals requires a clear understanding of the legal and regulatory frameworks that govern hydrogen production, distribution, and use.

This report provides a **comprehensive mapping of relevant legislation and standardisation measures** at EU, national, and regional levels. It links directly to LIHYP work packages by supporting:

WP1 – H2 Platform Hub: development of a digital marketplace for hydrogen stakeholders, and data on hydrogen supply, demand, and trade.

WP2 – Transport Pilots: integration of hydrogen infrastructure, harmonisation of standards, and promotion of incentives to create a level playing field with fossil fuels.

By presenting key EU directives, national strategies, regulatory measures, and incentive schemes, the mapping equips project partners and stakeholders with a **solid knowledge base for planning investments, identifying regulatory gaps, and accelerating deployment**. It also serves as the foundation for the forthcoming **Gap Analysis Report (WP3)**, which will assess where additional alignment, incentives, or policy action are needed to scale hydrogen and Power-to-X (PtX) technologies across the North Sea Region.

Scope

The purpose of this document is to map the legislative status, and relevant standardisation measures important for the LIHYP project. Especially the following activities from each work package is mapped:

WP1 – H₂ platform-Hub

Strategic conception of a digital hydrogen & stakeholder platform.

- Create a North Sea Region (NSR) H₂ platform marketplace linking relevant stakeholders (H₂).
- Data mining for demand, production, and supply of H₂ from now till 2030.
- Steps towards managing shortages and surpluses of H₂ production.

WP2 – Pilots – transport

- Steps to system integration for H₂ infrastructures, quality, harmonization, and standardization.
- Promote incentives for H₂, contribute to level playing field with fossil fuels.

The optimal link to these activities is crucial. Therefore, this mapping needs to interlink with the activities to provide project partners with a solid overview of the relevant legislation and standardisation on the EU-level, as well as National Level.

A working group of project partners from each country have prepared this mapping in order to get in-depth knowledge on all levels. The results will be shown in the project meetings and is the foundation for “Gaps Analysis Report” in WP3.

Proposed Structure

Purpose	The overall purpose of the legislation Who is it meant for? What is the reason for the legislation			
Overall objective	Measurable objectives in the legislation, perhaps 2025, 2030 or 2050 goals/objectives. Preferably numbers			
Relevance on hydrogen and PtX	The relevance for LIHYP and other hydrogen initiatives. Why is this legislation important for hydrogen?			
Status	What is the EU-status for implementation. The national implementation is done by each region below.			
Implementation into national legislation	BeNeLux	Denmark	France	Germany

Section 1 - EU Level

1.1 EU Emission Trading System (ETS)

Purpose – Part of Fit For 55	Cap-and-trade mechanism for pricing CO2 emissions in the EU, to obtain climate neutrality in the EU latest in 2050 and reduce net greenhouse emissions by minimum 55% compared to the 1990 levels in 2030.
Overall objective	To reduce emission in the energy sector, iron- and steel production, mineral industry, the chemical industry, the paper industry, aluminium production, and aviation.
Relevance on hydrogen and PtX	The directive is to ensure that green hydrogen gets the same benefits as fossil fuels in EU's ETS. This means that the producers of green hydrogen can get allowances to sell and by that reduce the cost gap between green hydrogen and blue hydrogen. This is to make it attractive to invest in green hydrogen, which can contribute to reducing the emissions in the industries and transport sector.
Status	Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending ¹

¹ [Directive - 2003/87 - DE - EUR-Lex.](#)

1.2 Renewable Energy Directive III (REDIII)

Purpose – Part of Fit For 55	The directive establishes a common framework to promote energy from renewable energy sources. It sets a binding target for the Union for the total share of energy from renewable energy sources in the Union's gross final energy consumption in 2030.
Overall objective	42,5% RE share in the EU by 2030 (earlier goal 32%). The countries must clarify their contribution to the joint goal by the NECP's (National Energy and Climate Plans).
Relevance on hydrogen and PtX	By 2030 42% of hydrogen used in the industries must be RFNBO (Renewable Fuels of Non-Biological Origin), and 60% by 2035 with a few caveats. For the transport sector, 5.5% of fuel must be renewable (either biofuel or RFNBO, typically based on hydrogen) in 2030, of which 1% must be RFNBO.
Status	Adopted and published in Directive (EU) 2023/2413 of 18 October 2023. ²

Furthermore, the **Commission Delegated Regulation (EU) 2023/1184 of 10 February 2023 supplementing Directive (EU) 2018/2001** by establishing a Union methodology setting out detailed rules for the production of renewable liquid and gaseous transport fuels of non-biological origin.^{3 4}

² [Directive - EU - 2023/2413 - DE - Renewable Energy Directive - EUR-Lex](#)

³ [3d3d0214-75f4-4e79-805e-3240526e2082_en](#) Proposal

⁴ [7d6e84e5-a188-4573-b0f6-2d069fd04e85_en](#) Annex

1.3 H2 and Gas package

Purpose – Part of Fit For 55	To create common for and regulation of the internal market for natural and renewable gas and hydrogen.
Overall objective	To create a competitive hydrogen- and gas market, and infrastructure which expands the production and consumption of hydrogen and create the legal framework for cross-border hydrogen network. Both within the EU and with 3rd countries.
Relevance on hydrogen and PtX	The entire proposal is expected to be relevant for PtX, but specifically rules are expected on discounts on tariffs when green gases are fed into the natural gas grid, and the possibility of financial transfers for development of hydrogen infrastructure.
Status	Adopted and published in June 2024 (Directive (EU) 2024/1788 of 13 June 2024 ⁵ and Regulation (EU) 2024/1789 of 13 June 2024) ⁶ .

Furthermore, the proposal for a **delegated regulation of 8th July 2025 for supplementing Directive (EU) 2024/1788** by specifying a methodology for assessing greenhouse gas emissions savings from low-carbon fuels.^{7 8}

⁵ [Directive - EU - 2024/1788 - DE - EUR-Lex](#)

⁶ [Regulation \(EU\) 2024/1789 of 13 June 2024](#)

⁷ [3d3d0214-75f4-4e79-805e-3240526e2082_en](#). Proposal

⁸ [7d6e84e5-a188-4573-b0f6-2d069fd04e85_en](#). Annex

1.4 European Network of Network Operators for Hydrogen (ENNOH)⁹ and Agency for the Cooperation of Energy Regulators (ACER)¹⁰

Purpose	“In order to ensure optimal management of the Union hydrogen network and to allow trading and supplying hydrogen across borders in the Union, a European Network of Network Operators for Hydrogen (ENNOH) should be established. The tasks of the ENNOH should be carried out in compliance with the Union competition rules. The tasks of the ENNOH should be well-defined and its working method should ensure efficiency, transparency, and the representative nature of the ENNOH. The network codes prepared by ENNOH should not replace the necessary national network codes for non-cross-border issued”.
Overall objective	“Until the ENNOH is established, a temporary platform should be set up under the lead of the Commission with the involvement of Agency for the Cooperation of Energy Regulators (ACER) and all relevant market participants, including the ENTSO for Gas, the ENTSO for Electricity and the EU DSO entity. This platform should support early work on scoping and developing issues relevant for the building up of the hydrogen network and markets without formal decision-making powers. The platform should be dissolved once ENNOH is established. Until the ENNOH is established, the ENTSO for GAS will be responsible for the development of Union-wide network development plans, including hydrogen networks”.
Relevance on hydrogen and PtX	“In order to ensure transparency regarding the development of the hydrogen network in the Union, the ENNOH should establish, publish and regularly update a non-binding Union-wide ten-year network development plan for hydrogen targeted at the needs of the developing hydrogen markets. Viable hydrogen transportation networks and necessary interconnections, relevant from a commercial point of view, should be included in that network development

⁹ [Welcome | ENNOH](#)

¹⁰ [ACER Opinion 10-2024 on ENNOH's statutory documents](#)

	plan. The ENNOH should participate in the development of the energy system wide cost-benefit analysis. For that purpose, the ENNOH should closely cooperate with the ENTSO for Electricity and the ENTSO for Gas to facilitate system integration. The ENNOH should undertake those tasks for the first time for the development of the 8th list projects of common interest, provided it is operational and, in the position, to deliver the necessary input to the ten-year network development plan by 2026. The ENNOH will establish a central, web-based platform for making available all data relevant for market participants to gain effective access to the network”.
Status	“By 1st September 2024, the hydrogen network operators shall submit to the Commission and to Acer the draft statutes, a list of members and draft rules of procedure, including the rules of procedures on the consultation of stakeholders, of the ENNOH to be established”.

2 National Level

2.1 Netherlands

2.1.1 Interreg North-West Europe (NWE)

Purpose	The aim of the Interreg North-West Europe (NWE) programme is to promote cooperation and exchange of knowledge between different regions in North-West Europe. This is done through financial support for projects aimed at regional development and innovation.
Overall objective	The overall objective is to stimulate sustainable growth, promote economic development and contribute to addressing common challenges in the regions of North-West Europe.
Relevance on hydrogen and PtX	The Interreg NWE programme may be relevant for projects focused on hydrogen and Power-to-X (PtX) technologies, as it focuses on innovation and sustainable development in different sectors, including energy. Projects that contribute to the implementation, research or development of hydrogen- and PtX-related solutions can fit within this programme.
Status	Start date: 15 November 2023 End date: 21 March 2024 Max 60% funding per project The status of specific projects within the Interreg NWE programme may vary depending on ongoing initiatives and funding cycles. The programme includes several projects with different focus areas, including energy, environment, innovation and regional development. Interreg programmes themselves are coordinated at European level and funded by the European Commission. Implementation into national legislation is often indirect and happens through application of EU rules and guidelines in national projects using Interreg grants.

2.1.2 DEI+: Energy and climate innovations

Purpose	DEI+ aims to stimulate and support innovative energy and climate projects. It focuses on demonstrating and developing new technologies, processes or applications that contribute to the reduction of CO2 emissions and the transition to sustainable energy.
Overall objective	The overall objective of DEI+ is to accelerate the development and implementation of innovative solutions that contribute to the Dutch energy transition and climate goals. This includes increasing energy efficiency, boosting sustainable energy production and reducing greenhouse gas emissions.
Relevance on hydrogen and PtX	DEI+ is relevant for projects focused on hydrogen and Power-to-X (PtX) technologies. The programme supports projects engaged in the development, demonstration and implementation of hydrogen production, storage, distribution and applications, as well as PtX technologies that use hydrogen as an intermediate product.
Status	Start date: Tuesday 21 November 2023 End date: Thursday 29 August 2024 Maximum grant amount: Demonstration project is €30 million. Pilot project is €25 million. Test and experimental infrastructure project is €25 million. Total budget: € 141.000.000

2.1.3 DEI+: Hydrogen and green chemistry (GroenvermogenNL)

Purpose	The aim of the "Hydrogen and Green Chemistry" programme within DEI+ is to encourage and support innovative projects focusing on hydrogen production, applications and green chemistry. It aims to develop and demonstrate technologies and processes that contribute to a sustainable, CO2-neutral hydrogen economy.
Overall objective	The overall objective is to accelerate the transition to a low-carbon economy by promoting the development and application of hydrogen technologies and green chemical processes. This includes reducing CO2 emissions, promoting the production of green hydrogen and encouraging sustainable chemical processes.
Relevance on hydrogen and PtX	The "Hydrogen and Green Chemistry" programme focuses specifically on hydrogen as an energy carrier and green chemistry. It supports projects dealing with hydrogen production, storage, distribution and applications, as well as initiatives involving PtX processes using hydrogen as an intermediate product.
Status	Start date: Monday 3 July 2023 End date: Tuesday 25 June 2024 First-come, first-served rule applies. Grant is up to €15 million. Total budget: € 40.000.000 The status of this programme may vary depending on ongoing funding rounds and projects within DEI+. The programme is regularly updated and provides support to projects that meet the criteria of the specific grant round. The implementation of the "Hydrogen and Green Chemistry" programme within DEI+ takes place within the framework of Dutch energy innovation and climate policy legislation. The conditions and rules for participation in this programme are set within the national policy aimed at promoting hydrogen and green chemistry technologies.

2.1.4 SDE++

Purpose	The aim of the Sustainable Energy Production and Climate Transition Incentive Scheme (SDE++) is to stimulate renewable energy production and contribute to the reduction of greenhouse gas emissions. The scheme supports the development and implementation of renewable energy sources and technologies in the Netherlands.
Overall objective	The overall objective of the SDE++ is to promote the energy transition to a more sustainable and climate-neutral energy supply. The programme aims to reduce CO2 emissions by stimulating renewable energy generation, thus contributing to climate objectives.
Relevance on hydrogen and PtX	The SDE++ scheme is relevant to hydrogen and Power-to-X (PtX) projects aimed at producing, storing and applying green hydrogen, as well as PtX processes using hydrogen as an intermediate product. These technologies are encouraged within the scheme to support the transition to renewable energy.
Status	Temporarily closed Start date: Tuesday 5 September 2023 End date: Thursday 5 October 2023 Total budget: € 8.000.000.000 The status of the SDE++ scheme varies depending on the established grant rounds and availability of funding. The programme is regularly reviewed and updated to respond to changing needs and technological developments. The implementation of the SDE++ scheme is part of national energy policy and enshrined in Dutch legislation. The conditions, criteria and subsidy structure are determined within the legal framework to support the development of renewable energy projects.

2.1.5 Groningen National Programme (NPG) 2024-2029

Purpose	The main aim of the scheme is to promote both large industrial clusters and smaller hydrogen chains, with a specific focus on supporting small and medium-sized enterprises (SMEs). The aim is to create a sustainable energy economy and encourage cooperation between companies.
Overall objective	The overall objective is to facilitate concrete development of hydrogen chains in the northern Netherlands. This includes encouraging investment decisions, permit applications and contracts within the period 2024-2029, with an available budget of around €10 million in grants.
Relevance on hydrogen and PtX	The scheme is relevant for the development of hydrogen chains, both on a large scale (such as in Eemshaven, Delfzijl, and East Groningen) and on a smaller scale in the province of Groningen. The diversity in scale and cooperation contributes to a balanced hydrogen ecosystem.
Status	The scheme is currently in the announcement and preparation phase. Work is underway on the terms, conditions and selection criteria to introduce the scheme and support projects from 2024. The scheme is expected to be implemented as part of the Groningen National Programme within the wider national energy policy and will comply with legal requirements and guidelines for subsidy schemes.

2.2 Belgium

2.2.1 Hydrogen law (Federal level)

Purpose	The law of 11 July 2023 on the transport of hydrogen by pipelines was published in the Belgian Law Gazette on 25 July 2023. This “hydrogen law” organises the designation of the hydrogen network operator who will be responsible for planning, developing and managing the hydrogen transport network in Belgium.¹¹ The Council of Ministers decided on 14 July 2023 to make 250 million euros available to the hydrogen network operator for the construction of a hydrogen connection with Germany, and the development of the hydrogen transport network in and between the industrial clusters of Ghent, Antwerp, Mons, Charleroi and Liège. The hydrogen network operator may appeal to this financial support in accordance with the conditions and procedure of Article 19 of the hydrogen law. In no case may this grant exceed 50% of the total investment.
Overall objective	The hydrogen law guarantees non-discriminatory access to the hydrogen transport network for all interested parties and, defines i.e. the rules and procedures for preparing the network development plan and for setting regulated network tariffs. The law also, designates the CREG as the regulator for hydrogen transmission.
Relevance on hydrogen and PtX	The designation of a Hydrogen Network operator is crucial for the development of the Hydrogen backbone.
Status	Only one submission to the call for applications for the designation of the Hydrogen Network operator was received.

¹¹ <https://economie.fgov.be/nl/themas/energie/bronnen-en-dragers-van-energie/waterstof/regulering-van-het-vervoer-van>

2.2.2 STRES subsidy (Regional level: Flanders)

Purpose	
Overall objective	Enterprises (not for non-profit organizations) can obtain a subsidy from VLAIO for green investments in "strategic" cutting-edge technology in the Flemish Region. The minimum investment is €3 million. The support percentage varies from 20% to 40% and depends on the performance of the technology, the size of the company and the accepted extra cost of the essential components.
Relevance on hydrogen and PtX	This support scheme (STRES) complements the Ecologiepremie+. Unlike the standard technology list, which restricts companies to predefined options, STRES accommodates larger and more specific investment projects.
Status	Support per company is limited to a maximum of €1 million per three years. ¹²

¹² [Strategische ecologiesteun | VLAIO](#)

2.2.3 Best Available Techniques (BAT) study (Federal level)

Purpose	The study focuses on the measures needed to operate a hydrogen filling station in a safe and environmentally friendly way. Because of the high storage and compression pressure, among other things, a number of measures will be explicitly focused on reducing the associated risks to an acceptable level. The calculation of internal separation and risk distances is an example of such a measure.
Overall objective	This BAT study determines the Best Available Techniques (BAT) for the small-scale distribution of hydrogen to vehicles by means of hydrogen refueling stations. One of the main objectives of the BAT study is to formulate a well-founded recommendation for a specific VLAREM framework of conditions.
Relevance on hydrogen and PtX	The study scope provides guidelines and includes fixed hydrogen refuelling stations that: are supplied hydrogen from local production, from a pipeline, or by delivery of gaseous hydrogen by tube trailers or battery vehicles (where the contents of the trailer are unloaded, or the trailer with contents remains); have a compressor for boosting the pressure to 450 and 950 bar for delivery to 350 and 700 bar, respectively; are able to deliver gaseous hydrogen to vehicles at 350 and 700 bar.
Status	The final status of the study can be found here. ¹³

¹³ https://emis.vito.be/sites/emis/files/study/BBT-studie_Waterstoftankstations_Eindrapport_dec-2020.pdf

2.2.4 Road tax and registration tax exemption (Federal level)

Purpose	
Overall objective	
Relevance on hydrogen and PtX	Federal level: From 2026 onwards, only zero-emission company vehicles will be 100% fiscally deductible, while non-zero-emission vehicles will gradually be made less attractive fiscally. Also, only zero-emission vehicles will be eligible for the company's mobility budget from 2026 onwards. Federal level: Quantitative targets for the purchase of low-emission vehicles by the federal government: For departments with more than 20 vehicles, at least 5% of the new vehicles should be electric, hybrid or CNG. Every year this percentage increases with 5% until a percentage of 25% is reached. The Climate plan for Flanders says that from 2021 onwards, the Flemish government will no longer buy or lease passenger cars with only a traditional combustion engine. Brussels: From 2025 100% of the government vehicles should be zero emission.
Status	

2.2.5 Road tax and registration tax exemption (Regional level: Flanders, Wallonia and Brussels)

Purpose	
Overall objective	
Relevance on hydrogen and PtX	In Flanders BEVs are exempt from vehicle registration tax in the same way as hydrogen vehicles (= motorcycles (<50 cc), passenger cars and light duty vehicles). Wallonia and Brussels: BEVs (motorcycles and passenger cars) enjoy a flat-fee vehicle registration tax (61,5 €). Light duty vehicles are exempt from vehicle registration tax regardless of their powertrain. Company cars have a taxable benefit in Belgium. To calculate this taxable benefit in kind, the catalogue value of the vehicle should be multiplied with a percentage of age, 6/7 and the CO2 percentage. When the emission of the vehicle is lower than the basis percentage (5,5%) based on reference CO2 emissions (for petrol cars this is 111 g/km and for diesel cars 91 g/km), it will be lowered with 0,1% per gram CO2, with a minimum of 4%. For FCEVs the 4% minimum percentage is used to calculate the taxable benefit in kind. This benefit is at least 1.360 euro per year.
Status	Non-road mobile machinery/train/aviation don't pay any vehicle registration tax in Flanders regardless of their powertrain.

2.2.6 Ecologiepremie+ (Regional level: Flanders)

Purpose	An ecology bonus is a financial subsidy for SMEs and large companies realising ecological investments in the Flemish Region. With the ecologiepremie+, the Flemish government aims to encourage companies to organise their production process in a more environmentally-friendly and energy-efficient manner. It will therefore pay a proportion of the extra cost involved in such investment.
Overall objective	The ecology premium plus is a scheme that aims to support standardised technologies mentioned on a limitative technologies list.^{14 15} The subsidy funds between 15% to 55% of the extra cost of the investment, depending on the scope of the enterprise and technology.
Relevance on hydrogen and PtX	This CAPEX support is also available for several hydrogen related investments: - Hydrogen Refuelling infrastructure - Conversion of a vehicle to a hydrogen fuel cell system - Conversion of a vehicle to a hydrogen/diesel dual fuel combustion engine - Light-duty vehicles (max. 3,5 tonnes) driven by a hydrogen fuel cell system - Truck driven by a hydrogen fuel cell system - Truck driven by a dual-fuel (hydrogen/diesel) combustion engine
Status	Operational

¹⁴ <https://www.vlaio.be/nl/media/252>

¹⁵ <https://www.vlaio.be/nl/subsidies-financiering/limitatieve-technologieen>

2.2.7 IPCEI (Regional level: Flanders and Wallonia)

Purpose	In the field of hydrogen production, Flanders is providing IPCEI support for the construction of a new large-scale plant in Oevel (9,000 m²) for Accelera (by Cummins). The expansion also accounts for at least 150 additional personnel. In Wallonia, electrolyser manufacturer John Cockerill received a similar grant via IPCEI Hydrogen. John Cockerill's project revolves around research and innovation dedicated to the design of a 5 MW, 1000 Nm³/hr alkaline electrolyser at 30 bar and the industrialization of its large-scale production in Belgium and France.
Overall objective	
Relevance on hydrogen and PtX	
Status	

2.3 Luxembourg

2.3.1 Luxembourgish draft law relating to the establishment of hydrogen transport networks

Purpose	This law aims to establish a framework for the establishment of hydrogen transport networks with the aim of supporting the planning and rapid and efficient development of the renewable hydrogen market and leveraging its benefits for the energy transition. The law is drafted by the Ministry of Energy and Regional Planning and adopted on 28 July 2023
Overall objective	The establishment of a legal framework so that an infrastructure allowing the transport of substantial volumes of hydrogen produced at competitive costs abroad can be planned, developed, built and operated; The granting of at least one authorization to a hydrogen network manager who can, in close consultation with the minister and the regulatory authority, plan, develop, build and operate a hydrogen network in Luxembourg, including interconnections to neighbouring countries, while considering the possible conversion of natural gas infrastructure; The planning, development and construction of a hydrogen network in Luxembourg constitute the essential prerequisites which enable the decarbonization of priority sectors requiring renewable hydrogen, namely (i) industry, (ii) transport systems which are difficult to electrify and (iii) the integrated energy sector; The development of a hydrogen network in coordination with neighbouring countries in order to size Luxembourg's infrastructure so that it can also be used for transit purposes and thus improve the economic attractiveness of a connection to this network for network users in Luxembourg; Legal certainty and therefore a certain security in planning for a future hydrogen network manager in Luxembourg; Investments encountered during the planning, development and construction of a hydrogen network are eligible for state aid and in particular in accordance with the European framework, such as the general category exemption regulation;

	Creation of prerequisites for a future hydrogen network manager in Luxembourg to be eligible to submit projects of common interest (PIC), for projects with a pronounced cross-border character, with a view to potential subsidies available within the framework of the Connecting Europe Facility (CEF), also called the Connecting Europe Facility (CEF).
Relevance on hydrogen and PtX	Rules and conditions to assign a Hydrogen Network Operator. It is foreseen that the interconnected hydrogen network could enter service no later than 2035
Status	Draft for consultation

2.3.2 No 423 Aid scheme for zero-emission vehicles of CO2¹⁶

Purpose	Reduce CO2 emissions from the transport sector
Overall objective	To accelerate the transition to zero-emission mobility, a maximum premium of EUR 8.000 is proposed for zero-emission vehicles of CO2, including 100 % electric cars (EVB), hydrogen fuel cell cars (FCEV) and 100 % electric vans and hydrogen fuel cell vans. This premium may vary depending on the energy consumption, power and size of the vehicle in question. The current regime applies to orders placed until 31.03.24. In addition, financial support is available for cycles (conventional and pedelec ²⁵) and light vehicles (motorcycles, quadricycle and mopeds) 100 %, applicable to bicycles, for all invoices up to 31.3.2024.
Relevance on hydrogen and PtX	Cars, vans, bikes
Status	Implemented 2019-2024

¹⁶ <https://legilux.public.lu/eli/etat/leg/rqd/2019/03/07/a183/jo>

2.3.3 No 426 Aid scheme for the acquisition of zero-emission heavy-duty vehicles¹⁷

Purpose	Reduce CO2 emissions from the transport sector
Overall objective	Following the tripartite agreement reached on 31 March 2022, the government introduced in April 2023 new support for companies investing in zero-emission heavy-duty vehicles (N2 and N3). The aid scheme was introduced by setting up a temporary measure in the form of a pilot project, on the basis of the amended Law of 15 December 2017 on an aid scheme for environmental protection. Medium weight and heavy-duty trucks equipped with zero greenhouse gas emission engines, such as pure electric vehicles and hydrogen fuel cell vehicles, are eligible for this support. In addition, vehicles equipped with an internal combustion engine with CO2 emissions of less than 1 g/kWh are also eligible, as well as solutions for converting existing thermal vehicles into zero-rolling vehicles.
Relevance on hydrogen and PtX	Medium and heavy duty trucks
Status	Implemented 2023-

¹⁷ <https://guichet.public.lu/fr/entreprises/financement-aides/aides-environnement/vehicules-zero-emission/aide-vehicules-zero-emission.html>

2.4 Denmark

The Danish climate minister gives the go ahead for Energinet to initiate a maturation project, which is the next step on the way to establishing an infrastructure for transport of hydrogen. The focus of the project is, among other things, the possibility of exporting Danish-produced hydrogen to the German market.

Climate, Energy and Supply Minister Lars Løkke Rasmussen have given Energinet permission to initiate a so-called maturation project to investigate possible solutions for transporting hydrogen via pipelines in Jutland.

A feasibility study carried out by Energinet concludes that there can be great benefits for society by establishing a hydrogen pipeline in Jutland and connecting it to Germany and Central Europe hydrogen market. It is, among other things, these possible gains, which Energinet will now investigate in more details.

Energinet's analyses indicate that there will be hydrogen production and -consumption in Denmark and abroad, which must be linked together with pipelines. An infrastructure for the transport of hydrogen in pipes and for underground storage is an important link in the implementation of the PtX strategy for the development and promotion of hydrogen and green fuels.¹⁸

The Danish Energy Agency put out a PtX tender in April at 1.25 bn. DKK. where the applications opened, and there has been great interest in the tender. Companies have applied for more than 4 bn. DKK. That's more than three times the budget's funds.

Six projects were picked as winners in the tender and can now start production of green hydrogen in Denmark.

¹⁸ [Nyt projekt skal forberede etablering af rørledninger til transport af brint](#)

2.4.1 Development and promotion of hydrogen and green fuels. (PtX strategy)¹⁹

Purpose	Denmark should aim to build 4-6 GW of electrolysis capacity in 2030.
Overall objective	In relation to this objective emphasizes that hydrogen be documented as renewable by being produced with electricity from renewable energy sources and comply with EU regulations in the area.
Relevance on hydrogen and PtX	The focus in this area is to promote green hydrogen and green PtX products.
Status	EU regulation describing green hydrogen production are in place
Implementation into national legislation	The agreement between the government parties were signed on 15th March 2022

Establishing a PtX task force to support Danish hydrogen market and infrastructure. With the first steps taken to establish framework conditions that can promote the development of a PtX market in Denmark. There is also a need to develop regulation of the hydrogen market in the EU. So, that Denmark can help with the goal set to reduce CO₂ emissions in EU, through first Germany and then through a hydrogen backbone infrastructure as described in LiHyp.

¹⁹ [aftale-om-udvikling-og-fremme-af-brint-og-groenne-braendstoffer.pdf](#)

2.4.2 Possibility of establishing a hydrogen infrastructure.²⁰

Purpose	Ownership and operation of the Danish pipeline-bound hydrogen infrastructure of the future. 22nd May 2023. Energinet (TSO) and Evida (DSO). Who owns and runs the methane gas infrastructure in Denmark.
Overall objective	To help regulate the Danish power grid and to fulfil the political ambition of 4-6 GW electrolysis capacity in 2030. To support exports and strengthen Europe's supply security.
Relevance on hydrogen and PtX	Finding projects for producers and consumers
Status	H ₂ & Gas package, the proposal has been presented, and the second trilogies took place 18th July 2023.
Implementation into national legislation	On 20th April 2023, the Danish Parliament secured better framework conditions for green technologies, e.g. PtX facilities, by allowing the establishment of commercially owned direct electricity connections.

In this agreement it is Energinet that will handle the cross-border connections to either:
Danish receiving point.
Offshore pipe bottom hydrogen infrastructure.
Hydrogen storage.

Evida connects domestic hydrogen producers and consumers and can connect these into the backbone infrastructure that Energinet is providing.

It is also possible to have privately owned hydrogen infrastructure in areas where neither Energinet or Evida see the value in owning and operating the infrastructure. The government reserves the right to return later if they find the need for clarification of this.

²⁰ [Aftaletekst - mulighed for etablering af brintinfrastruktur.pdf](#)

2.4.3 Development and promotion of hydrogen and green fuels (Power-to-x strategy) 15th March 2022

Purpose	Between the government and the parliament. The possibilities to establish a Danish hydrogen infrastructure is agreed upon.
Overall objective	So, that the necessary framework can be created so that it is possible in Denmark to establish a hydrogen infrastructure for the transport of hydrogen in pipes and storage in the underground.
Relevance on hydrogen and PtX	The parties take note, that a hydrogen infrastructure can make it easier for Danish and international companies to produce and use PtX locally, regionally, and nationally and possibly export hydrogen abroad.
Status	
Implementation into national legislation	

The contracting parties agree that hydrogen infrastructure for our neighbouring countries, including Germany, can support Denmark's opportunities to contribute to decarbonisation on a European level.

2.5 France

2.5.1 National Energy Policy objectives (Energy Code, art. L. 100-4)

Purpose	
Overall objective	Responding to the ecological and climatic emergency
Relevance on hydrogen and PtX	One of the objectives of the National Energy Policy is to develop low-carbon and renewable hydrogen and its industrial, energy and mobility uses, with the aim of reaching around 20 to 40% of total hydrogen and industrial hydrogen consumption by 2030.
Status	

2.5.2 Multiannual Energy Planning (PPE 2: 2019-2028)

Purpose	
Overall objective	The PPE expresses the guidelines and priorities for action of the public authorities for the management of all forms of energy on the continental metropolitan territory, in order to achieve the objectives of the National Energy Policy. It covers two successive five-year periods (2019-2023 / 2024-2028). PPE 2: Decree no. 2020-456 of April 21, 2000 The next PPE (PPE 3: 2024-2033) is currently being drawn up.
Relevance on hydrogen and PtX	PPE 2 objectives: - Power to gas demonstrators (MW): - o 1 to 10 demonstrators by 31.12.2023 - o 10 to 100 demonstrators by 31.12.2028 - Rate of decarbonated hydrogen in industrial hydrogen: 10% by 31.12.2023, 20 to 40% by 31.12.2028 - 100 hydrogen stations by 31.12.2023, - 400 to 1000 stations by 31.12.2028 - 5,000 hydrogen-powered light commercial vehicles by 2023, 20,000 to 50,000 by 2028 - 200 hydrogen-powered heavy-duty vehicles in 2023, 800 to 2,000 in 2028 PPE 3 objectives: An electrolyser deployment target should be introduced to be in line with the objective set by the national strategy (see below): production of 6.5 gigawatts (GW) of decarbonized hydrogen by electrolysis by 2030, in order to decarbonize part of the hydrogen currently consumed.
Status	

2.5.3 National Strategy for the development of carbon-free hydrogen in France - 08.09.2020

Purpose	The <u>Stratégie nationale pour le développement de l'hydrogène décarboné en France</u> (2020, €9bn) follows on from the <u>Plan national de l'hydrogène pour la transition énergétique</u> (2018). Three priorities: 1) Decarbonize industry by developing a French electrolysis industry, 2) Develop decarbonized hydrogen-powered heavy-duty mobility, 3) Support research, innovation and skills development to promote the uses of tomorrow.
Overall objective	6.5 gigawatts (GW) of electrolyzers installed by 2030, producing 770 kt (kilotons - kt) of hydrogen (160 kt for transport, 150 kt for refineries, 460 kt for industry), encourage the emergence of gigafactory projects by building an Important Project of Common European Interest (IPCEI/PIIEC), save over 6 Mt of CO₂ by 2030 by converting land transport to hydrogen technologies, followed by river, sea and air transport, generate between 50,000 and 150,000 direct and indirect jobs in France.
Relevance on hydrogen and PtX	The French National Strategy considers decarbonized and renewable hydrogen as one of the main solutions for decarbonizing industry and transport, for storing renewable energy, and for developing a new job-creating industry.
Status	In August 2023, the Minister for Energy Transition announced the launch of calls for projects in 2024, 2025 and 2026 to allocate generating capacity, in the form of tranches of 150 (2024), 200 (2025) and 600 megawatts (MG) (2026). A total of 1,000 megawatts (MG) or 1 gigawatt (GW). In view of the delay in the call for applications, the ministry has decided to skip the first phase and directly call for a volume of 200 MW of projects in 2025.

	France has secured between 2.5 and 3 GW of electrolysis capacity out of the 6.5 GW planned in its national strategy (December 2023).
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In application of the 2020 National Strategy,

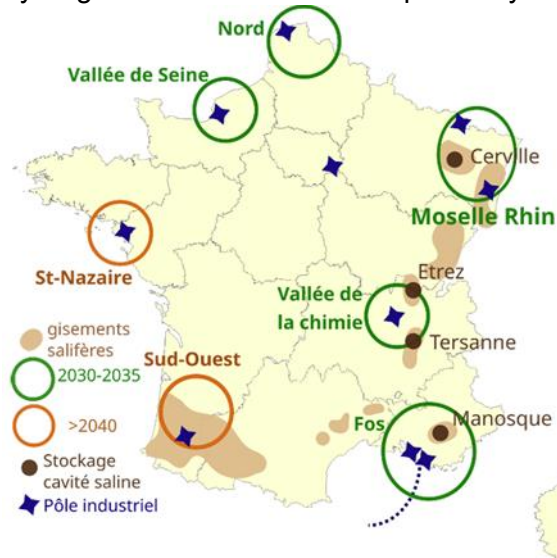
- A dedicated Priority Research Programme and Equipment (PEPR) has enabled €83 million to be allocated to 19 projects covering the entire value chain, from production (low- and high-temperature electrolysis, photoelectrocatalysis) storage (solid, gaseous and liquid) and applications (proton exchange membrane fuel cells or PEMFCs, solid oxide fuel cells or SOFCs, etc.),
- calls for projects (“appels à projets” - AAP) have been launched in 2020 and renewed each year:
 - o **"Ecosystèmes territoriaux hydrogène - EcosysH"** (2020 – 2023, ADEME): this call for projects (AAP) targeted both local authorities and companies wishing to invest in the production and distribution of hydrogen, as well as in industrial uses and mobility, particularly in the field of commercial vehicles and heavy transport (collective or goods). Certain stationary applications based on hydrogen fuel cell generator sets were also concerned, such as powering boats at dockside, or supporting networks or micro-grids in non-interconnected zones (“zones non interconnectées” - ZNI). This call for projects has so far (2025) enabled support for 46 ecosystem projects focused mainly on hydrogen mobility, for which integrated support has been provided for hydrogen production, distribution and consumer vehicles,
 - o **"Briques technologiques et démonstrateurs hydrogène"** (2023 – 2024, 350 M€): financed by the *Programme d'investissement d'Avenir* (PIA) and managed by ADEME, this call for projects (AAP) was primarily aimed at companies. It aimed to develop or improve components and systems linked to the production and transport of hydrogen and its uses, such as transport or energy supply applications, or to design and develop new vehicles, particularly for road haulage and rail transport. It could also support large-scale pilots and demonstrators (over 20MW) in France, to enable the hydrogen industry to develop new solutions and structure itself. 35 projects were supported,
- industrialization projects or "gigafactories" have emerged:

- o **PIIEC2 "Hy2Tech3"**: 10 French projects, including 4 for electrolyser production and 6 for road and rail mobility equipment, spread over 20 French sites,
 - o **PIIEC "Hy2Use4" and CEEAG (Climate, Energy and Environmental Aid Guidelines)**: 1.4 to 1.8 GW of massive projects for the production and use of carbon-free hydrogen in industry could emerge.
- **9 training projects** have been selected as winners of the call for expression of interest ("appel à manifestation d'intérêt" – AMI) "*Skills and Jobs of the Future*".

2.5.4 Revision of the national strategy for the development of low-carbon hydrogen in France (SNH II, April 2025)

Purpose	For France, the production of carbon-free hydrogen through electrolysis remains essential for industry and the heavy non-road transport sector (air and maritime). However, various factors lead to a smoothing out of hydrogen consumption over time and, consequently, a rationalisation of the achievable targets in terms of the deployment of this technology at different time horizons. France will continue to work at European level to ensure that low-carbon hydrogen is recognised at European level on an equal footing with renewable hydrogen in achieving European greenhouse gas emission reduction targets. The priority sectors for the use of low-carbon hydrogen are industry (refining, chemicals, fertilisers, steel) and heavy and intensive transport (particularly aviation and maritime transport).
Overall objective	- Increases the budget for low carbon hydrogen development by €2 billion (€9 billion) - The target of 6.5 gigawatts (GW) of electrolyzers installed by 2030 (set out in the 2020 National Strategy) has been reduced to 4.5 GW. This reduction takes into account the updated needs of the various sectors as well as deployment schedules that are ultimately slower than initially expected. By 2035, increased demand and the commissioning of various projects could result in an installed electrolysis capacity of 8 GW

- Mastering all building blocks in the hydrogen value chain
- By 2030, supply the hydrogen needed by the centres of mass consumption (industrial hubs: in particular Fos-sur-Mer, Dunkirk, Le Havre, Chemical Valley). Creation of an "intra-hub" hydrogen transport network linking producers and consumers in local loops. The route envisaged for these first hydrogen networks will be completed by 2026



- Consideration should also be given to "semi-centralised" consumption hubs around medium-sized cities or smaller industrial platforms, and "diffuse" hubs, particularly on the motorway network, to meet the objectives of the AFIR Regulation, in conjunction with the main industrial hubs where possible
- In the longer term, as part of the development of a European hydrogen transport network, and in particular the H2Med project, the development of a transport network between hubs could be further explored
- Support the deployment of low carbon hydrogen production for industrial use at a competitive price by implementing the low carbon hydrogen production support mechanism: Calls for tender representing €4 billion of public support for the deployment of 1 GW of electrolytic production. The first tranche (2025) will support a capacity of 200 MW. The long-term goal is to support a cumulative

	electrolysis capacity of 1 GW by mobilising around €4 billion - Analyse the appropriateness and procedures for importing hydrogen or its by-products, provided they are competitively available and zero carbon - Monitor developments in technologies for the production of hydrogen from biomass (pyrogasification, pyrolysis, plasmalysis) - Launch an exploratory study on natural hydrogen to assess the potential for extraction in France by 2025, its economic interest and its environmental impact. Map the underground and develop extraction techniques - Continue to develop a regulatory framework tailored to the realities of hydrogen (production, transport, storage, operation of pressure equipment, legal metrology applicable to metering, construction or conversion of transport pipelines, access to land, length of procedures,) - Develop French hydrogen diplomacy on the international stage: participate in the definition of international standards and standardisation processes, help French industry to export
Relevance on hydrogen and PtX	France wants to see the emergence of a low-carbon hydrogen production sector based on water electrolysis, using electricity from the metropolitan grid in conjunction with the development of low-carbon electricity production capacities (nuclear and renewable). The electricity requirements corresponding to the quantities of hydrogen identified for 2030 and produced by water electrolysis will be in the order of 20 to 30 TWh. Public support for the national hydrogen strategy will therefore be reserved for the production of carbon-free hydrogen by electrolysis.
Status	In August 2023, the Minister for Energy Transition announced the launch of calls for projects in 2024, 2025 and 2026 to allocate generating capacity, in the form of tranches of 150, 250 and then 600 megawatts (MG) respectively. A total of 1,000 megawatts (MG) or 1 gigawatt (GW). France has secured between 2.5 and 3 GW of electrolysis capacity out of the 6.5 GW planned in its national strategy (December 2023).

In application of the 2025 National Strategy:

- a new call for projects **“Hydrogen Innovation and Demonstration”** (IDH2) has been launched (2025 – 2026). It aims to support innovation and demonstration work to develop or improve components and systems related to hydrogen production, transport and use,
- A new call for projects, **“Light-duty hydrogen vehicles - LDH₂”** (17 May 2025 to 27 June 2025). The aim is to promote the technological development of fuel cells and tanks,
- Decarbonisation of industry and energy: support for two new key decarbonisation projects which will receive public funding under the Hydrogen PIIEC: ‘Green Horizon’ (Lhyfe/Yara) for ammonia, and ‘Masshyla’ (Total/Engie) for refining,
- Development of the value chain: a new project is being supported under the PIIEC, led by equipment manufacturer Gen-Hy, which will industrialise its breakthrough anion exchange membrane (AEM) technology for electrolyzers in Allenjoie (Doubs) to produce low-carbon hydrogen.
- Hydrogen mobility: the winners of the France 2030 ‘Sustainable Air Fuels’ (CARB AERO) call for projects have been announced.
- Skills training: in Bourgogne Franche Comté, the ‘École H2’ project aims to develop and structure the 90 training courses that already provide education on hydrogen. This project is supported by France 2030 with €6 million for a total investment of €14.9 million.

2.5.5 Ordinance no. 2021-167 of February 17, 2021, on hydrogen

Purpose	Put in place the conditions needed to achieve the objectives of the National Energy Policy for hydrogen as set out in Law no. 2019-1147 of November 8, 2019 on energy and the climate: develop low-carbon and renewable hydrogen and its industrial, energy and mobility uses, with the aim of reaching around 20 to 40% of total hydrogen and industrial hydrogen consumption by 2030 (C. énerg., art. L. 100-4-10°)
Overall objective	- Definition of the main categories of hydrogen: renewable, low-carbon and carbon-based (C. énerg., art. L. 811-1) - A <u>decree of 1 July 2024</u> defines the greenhouse gas emission threshold and the methodology for classifying hydrogen production as renewable or low-carbon. The carbon dioxide equivalent emission threshold, expressed in kilograms of carbon dioxide equivalent per kilogram of hydrogen (kgCO₂eq/kgH₂), provided for in Article L. 811-1 of the Energy Code, is set at 3.38 kgCO₂eq/kgH₂, - Establishment of a traceability mechanism for renewable and low-carbon hydrogen, with the creation of a production guarantee system that includes traceability guarantees when physical traceability of the hydrogen is possible and guarantees of origin when the hydrogen molecule cannot be traced (C. énerg., art. L. 821-1 et seq.), Set up a support mechanism for industries producing renewable or low-carbon hydrogen produced by water electrolysis: organize calls for tenders (AO) or calls for projects (AAP) enabling winners to benefit from a contract supporting their investments and guaranteeing additional remuneration (C. énerg., art. L. 812-1 et seq.).
Relevance on hydrogen and PtX	The implementation of these measures will contribute to the development of a low-carbon and renewable hydrogen market,

	• The traceability of hydrogen production will guarantee users that the hydrogen supplied to them is environmentally friendly, • The AO and AP will increase the production of low-carbon or renewable hydrogen and lower its price, • The remuneration complement will compensate for the higher production costs of low-carbon or renewable hydrogen compared with carbon-based hydrogen, • 4 Md€ will be allocated to this support system via a series of calls for projects (AAP) in several tranches: 150 MW in 2024 (budgeted in the 2024 Finance Bill: 680 M€), 200 MW in 2025 and 600 MW in 2026, i.e. an overall potential of 1,000 MW.
Status	• Ordinance no. 2021-167 introduced new provisions into the Energy Code (<i>art. L. 811-1 et seq.</i>) • A decree is currently being drafted to specify the provisions of article L. 811-1 of the Energy Code (thresholds and manufacturing processes for the various categories of hydrogen) • Decree no. 2023-854 of September 1, 2023, specifies the selection procedure for projects eligible for the support mechanism (<i>C. énerg., art. R. 812-1 et seq.</i>). Economic players are now waiting for the calls for projects.

2.5.6 Law no. 2023-175 of March 10, 2023, on accelerating the production of renewable energies

Purpose	Increase renewable energy (EnR) production in France.
Overall objective	Aims to remove the obstacles holding back the deployment of renewable energy projects (acceptability, acceleration of procedures, reduction in litigation), but also contains provisions designed to increase the production of low-carbon or renewable hydrogen.
Relevance on hydrogen and PtX	• Inclusion of an assessment of the potential for renewable or low-carbon hydrogen production in the Multiannual Energy Program (PPE) (<i>C. énerg.</i>, art. L. 141-2, 3°), • Experimentation (3 years) of a single referent for project developers of renewable or low-carbon hydrogen production and storage facilities, and for project developers of associated network structures (<i>L. n° 2023-175</i>, art. 81-V), • Simplified procedure for modifying the planning documents (<i>Schéma de cohérence territoriale – ScoT - Plan local d'urbanisme - PLU</i>) when the purpose of the modification is to support the development of renewable or low-carbon hydrogen production (<i>C. urb.</i>, art. L. 143-29-II and L. 153-31-II), • Acceleration and facilitation of the environmental authorization procedure, notably for development and construction projects for renewable or low-carbon hydrogen production facilities, as well as their connection to electricity grids (<i>C. urb.</i>, art. L. 300-2, <i>L. n° 2023-175</i>, art. 27), • Creation of a derogatory authorization system for renewable or low-carbon hydrogen production facilities located on wasteland and coupled, for the purposes of electricity supply, with photovoltaic or thermal solar energy production facilities located on industrial brine basins (derogation from the <i>Loi littoral</i> of January 3, 1986, <i>C. urb.</i>, art. L. 121-12-1-II).
Status	This law amends the Town Planning Code and the Energy Code

2.5.7 Article 266 Quindecies of the French Customs Code (Incentive tax on the use of renewable energy in transport - TIRUERT)

Purpose	
Overall objective	The TIRUERT aims to improve the incorporation of renewable energy in transport. This tax is triggered by the release of consumption of certain fuels (petrol, diesel, kerosene). The rate of the TIRUERT is reduced in proportion to the percentage of renewable energy, sustainable biofuels and renewable fuels contained in the fuels released for consumption by a taxpayer during the year in question (TIRUERT reduction).
Relevance on hydrogen and PtX	Renewable hydrogen (from 2023) and low-carbon hydrogen (from 2024) are included in the calculation of the share of renewable energy in the fuel supply. Renewable hydrogen also benefits from double counting (multiplication factor 2). This tax treatment helps to reduce the price of hydrogen at the pump.
Status	

2.5.8 Article 266 Sexdecies of the French Customs Code (Incentive tax to reduce greenhouse gas intensity in the transport sector)

Purpose	
Overall objective	The 2024 Finance Bill will create a new tax to encourage a reduction in the greenhouse gas emission intensity of fuels. This new tax will be added to the TIRUERT (article 266 quindecies of the French Customs Code) in order to combine the objectives of integrating renewable energies (TIRUERT) and reducing greenhouse gases. The national target percentage for the reduction of greenhouse gas emissions intensity in transport is 5% in 2025. The tax is zero if the national target percentage is achieved.
Relevance on hydrogen and PtX	Renewable hydrogen and low-carbon hydrogen produced by electrolysis will be compatible in the calculation of greenhouse gas emission reductions in transport.
Status	

2.5.9 Regulations governing facilities classified for environmental protection (installations classées pour la protection de l'environnement - ICPE) – Regulatory heading 3420: "Industrial-scale production by chemical or biological transformation of inorganic chemicals" (hydrogen in particular)

Purpose	Describes the safety rules to be observed by operators when producing hydrogen.
Overall objective	
Relevance on hydrogen and PtX	This regulation places the plant under the "Authorization procedure" (the strictest regime) from the first gram of H ₂ produced, which implies a cumbersome procedure for what is sometimes modest production. In France, the cumbersome "Authorization procedure" (due to this notion of "industrial scale production", whatever the process) is highlighted as a brake on the development of hydrogen production. Operators would like to see a distinction made in the IED directive between industrial-scale production sites and small-scale decentralized production and storage sites, in order to lighten authorization procedures and stimulate their deployment.
Status	

2.5.10 Regulations governing facilities classified for environmental protection (installations classées pour la protection de l'environnement - ICPE) – Regulatory heading 4715: "Storage of hydrogen in gaseous or liquid form (CAS number 133-74-0)"

Purpose	Sets out the safety rules to be followed by operators when storing hydrogen.
Overall objective	
Relevance on hydrogen and PtX	The storage facility will be subject to different permit categories depending on the amount of hydrogen likely to be stored: <100 kg: No applicable regulations ≥ 100 kg and <1 tonne: "Declaration procedure": compliance with the Decree of 12/02/1998 on the general requirements applicable to installations classified for environmental protection subject to declaration under heading no. 4715. ≥ 1 tonne: "Authorization" regime ≥ 5 tonnes: "Seveso low" threshold ≥ 50 tonnes: "Seveso high" threshold Decree No 2024/667 of 2 July 2024 amended ICPE regulatory heading 4715 to exclude marine hydrogen storage facilities from its scope, unless the facility is located within the administrative boundaries of a seaport.
Status	Work is underway to create an intermediate permit ("Registration procedure") between the "Declaration procedure" and the "Authorization procedure", for quantities of hydrogen gas (initially) between 1 and 5 tonnes. This "Registration" procedure will make the storage of hydrogen between 1 and 5 tonnes subject to less stringent constraints than at present. It will apply to facilities located outside SEVESO sites. More specifically, it will apply only to - Refuelling stations for cars - Forklift truck refuelling stations - Tube trailer refuelling stations - Fuel cell refuelling stations Other facilities will continue to be subject to the ICPE Authorization regime.

2.5.11 Regulations governing facilities classified for environmental protection

(installations classées pour la protection de l'environnement - ICPE) –
Regulatory heading 1416: "Installations, whether or not open to the public, where hydrogen gas is transferred into vehicle tanks, the daily quantity of hydrogen dispensed being greater than or equal to 2 kg/day"

Purpose	Sets out the rules to be followed by operators when dispensing hydrogen at refuelling stations.
Overall objective	
Relevance on hydrogen and PtX	<i>Order of 22/10/2018 relating to the general requirements applicable to installations classified for environmental protection subject to declaration under heading n° 1416 (hydrogen gas dispensing station) of the classified installations nomenclature.</i> Decree No 2024/667 of 2 July 2024 amended regulation heading 1416 of the ICPE to exclude marine hydrogen distribution facilities from its scope, unless the facility is located within the administrative boundaries of a seaport.
Status	This regulatory heading is currently being amended to: - make it applicable to rail vehicles and adapt it to river and sea vehicles; - modify the safety distances.

2.5.12 Regulations governing facilities classified for environmental protection (installations classées pour la protection de l'environnement - ICPE) – “Use of gaseous hydrogen to power gaseous hydrogen forklifts”

Purpose	Establish the rules to be followed by operators when using gaseous hydrogen for the refuelling of gaseous hydrogen powered forklifts.
Overall objective	
Relevance on hydrogen and PtX	Order of 26/11/2015 concerning the general requirements applicable to installations using hydrogen gas in an installation classified for environmental protection to power hydrogen gas powered forklift trucks, when the quantity of hydrogen present in the establishment falls under the declaration procedure for heading no. 4715
Status	

2.5.13 Order of March 13, 2020, on the conditions for converting combustion engine vehicles to battery or fuel cell electric drive ("retrofit order")

Purpose	Defines the conditions for type-approval and installation of devices for converting combustion engine vehicles to battery or fuel cell electric drive.
Overall objective	
Relevance on hydrogen and PtX	This order applies to the retrofitting of all passenger vehicles (category M) or goods vehicles (category N) with at least 4 wheels, as well as two-or three-wheel motor vehicles and motor quadricycles (category L).
Status	These regulations were improved in October 2023 to take account of feedback from the first type approvals and to respond to requests from the industry, which was consulted beforehand, in particular for heavy commercial vehicles (coaches, lorries). In particular, it introduces greater flexibility to modify the dimensions and weight of the converted vehicle and extends retrofitting to hydrogen combustion engines.

2.5.14 Experimenting with hydrogen motors in inland navigation: Order of August 20, 2019, on the issuance of navigation permits in a restricted navigation zone (known as the "Restricted Zone Order")

Purpose	Pending the adoption of European technical prescriptions (ESTRIN), this order aims to give operators the opportunity to experiment with electric-hydrogen propulsion, by granting them a derogation from national regulations.
Overall objective	
Relevance on hydrogen and PtX	Article D.4220-4 of the Transport Code and the Order of August 20, 2019, allow innovative projects to be authorized for navigation limited to part of the national territory. The competent authority (the Préfet) may thus authorize, with regard to navigation on the zones referred to in article D. 4211-1 (zones 1, 2, 3, 4 and Rhine), derogations from one or more provisions of the Transport Code (Title II of Book II, technical prescriptions) or the orders issued for its application, for journeys limited to a reduced geographical area or port zones. Requests for derogations concerning innovative projects must be submitted by the applicant as part of the declaration prior to starting work on the construction or modification of the boat, floating craft or floating establishment.
Status	

2.5.15 Decree of June 21, 2016, establishing the nomenclature of vehicles classified according to their level of emission of atmospheric pollutants in application of article R. 318-2 of the Highway Code

Purpose	Classification of vehicles according to their emission levels, to control access to low-emission zones (Crit'Air certificates).
Overall objective	
Relevance on hydrogen and PtX	Electric and hydrogen vehicles benefit from the green Crit'Air certificate, which gives them access to low-emission zones.
Status	

2.5.16 “Suramortissement” tax incentive (road vehicles), General Tax Code, art. 39 decies A and art. 39 decies A – I bis

Purpose													
Overall objective	Tax incentive for the purchase of fuel cell electric vehicles.												
Relevance on hydrogen and PtX	Article 39 decies A of the French General Tax Code allows companies to deduct from their taxable income a fraction of the original value, excluding financial expenses, of their investment in a new vehicle using exclusively one or more of the energies listed, in particular hydrogen. This incentive applies to the purchase of vehicles over 2.6 tonnes GVW (« poids total autorisé en charge » - PTAC). It also applies to new vehicles covered by a lease or lease with an option to purchase (« LOA »). <table><tr><th></th><th>PTAC entre 2,6 et 3,5 t</th><th>PTAC > 16 t</th><th>PTAC entre 3,5 et 16 t</th></tr><tr><td>Suramortissement</td><td>20%</td><td>40%</td><td>60%</td></tr><tr><td>Amortissement total</td><td>120 %</td><td>140 %</td><td>160 %</td></tr></table>		PTAC entre 2,6 et 3,5 t	PTAC > 16 t	PTAC entre 3,5 et 16 t	Suramortissement	20%	40%	60%	Amortissement total	120 %	140 %	160 %
	PTAC entre 2,6 et 3,5 t	PTAC > 16 t	PTAC entre 3,5 et 16 t										
Suramortissement	20%	40%	60%										
Amortissement total	120 %	140 %	160 %										
Status	The Climate and Resilience Act 2021 extended this tax incentive until 2030. The Finance Act for 2024 extended the depreciation allowance for the conversion of vehicles (GVW ≥ 2.6t) from internal combustion engines to battery electric or hydrogen fuel cell engines. This deduction applies to : - either the cost of the conversion - the cost of purchasing a converted vehicle, or - or to the costs of leasing such a converted vehicle (leasing, LOA or long-term hire). Eligible vehicles must be converted, purchased or leased between 1 January 2024 and 31 December 2030.												

2.5.17 “Suramortissement” tax incentive (inland waterway vessels and seagoing ships), General Tax Code, art. 39 decies C

Purpose	
Overall objective	Tax incentives for the conversion of inland waterway vessels and seagoing ships to electric power with fuel cells
Relevance on hydrogen and PtX	Article 39 decies C of the French General Tax Code allows companies to deduct from their taxable income an amount equal to 125% of the additional capitalised costs, excluding financial expenses, directly related to the installation of equipment, acquired when new, that enables the use of hydrogen (or another low-carbon propulsion system) as the main propulsion energy or for the production of electrical energy intended for the main propulsion of cargo or passenger vessels and that is allocated to their activity, if the contract for the acquisition of this equipment or for the construction of the vessel or boat is concluded between 1 January 2020 and 31 December 2024. This equipment includes fuel cells, hydrogen storage and compression equipment, and electric motors.
Status	

2.5.18 “Bonus écologique” for road vehicles, Energy Code, art. D. 251-1 and seq. (repealed)

Purpose	
Overall objective	Household support for the purchase of a very low emission vehicle
Relevance on hydrogen and PtX	The “Ecological bonus” was a national subsidy granted for the purchase or long-term lease (≥ 2 years) of certain new vehicles that use electricity or a combination of electricity and hydrogen as their sole energy source. This subsidy applied until 2022 to the purchase of heavy commercial vehicles (categories M3 and N3) and until 2024 to the purchase of light commercial vehicles.
Status	Heavy vehicles (categories M3 and N3) are no longer eligible since 1 January 2023. Light commercial vehicles are no longer eligible since the end of 2024 (<i>Decree 2024-1084 of 29 November 2024</i>). A new aid mechanism has been established solely for the year 2025 (call for projects, “ <i>Light-duty hydrogen vehicles - LDH₂</i> ” (17 May 2025 to 27 June 2025)).

2.5.19 “Prime à la conversion” for road vehicles, Energy Code, art. D. 251-4-1 (repealed)

Purpose	
Overall objective	Household support for the purchase of a very low emission vehicle
Relevance on hydrogen and PtX	The “Prime à la conversion” was a national subsidy granted for the purchase or long-term lease (≥ 2 years) of certain new vehicles that use electricity or a combination of electricity and hydrogen as their sole energy source, and the scrapping of a vehicle (vans or category N2 vehicles with a maximum mass ≤ 3.5 t) using petrol, natural gas, LPG, ethanol or superethanol as a partial or sole energy source.
Status	The “Prime à la conversion” was abolished in November 2024 (<i>Decree No. 2024-1084 of 29 November 2024</i>).

2.5.20 “Prime au retrofit” for road vehicles, Energy Code, art. D. 251-5, D. 251-5-1, D. 251-5-3

Purpose	
Overall objective	Household support for the purchase of a very low emission vehicle
Relevance on hydrogen and PtX	In 2020, a bonus (<i>Prime au retrofit</i>) was introduced for the retrofitting of electric (electric motor or fuel cell) passenger cars, vans, two- or three-wheeled motor vehicles and quadricycles. In 2022, this subsidy was extended to the retrofitting of M2 and M3 category vehicles (i.e. buses and coaches), as well as N2 and N3 category vehicles (heavy-duty vehicles > 3.5t and >12t). The amount of the subsidy was set at 40% of the conversion cost, up to a maximum of €30,000 for vehicles in categories M2 or M3 and €50,000 for vehicles in categories N2 or N3 (Energy Code, Art. D. 251-8-2).
Status	The “<i>Prime au retrofit</i>” was abolished for M3 and N3 vehicles at the beginning of 2023. Currently, the electric retrofit bonus (electric or fuel cell propulsion) only applies to passenger cars (M1), vans and vehicles in category N2 (GVW less than or equal to 3.5t). The bonus (which is tending to decrease) for vans and N2 vehicles depends on the vehicle class within the meaning of Annex 1 to Regulation (EC) No 715/2007: Class I: 40% of the purchase price up to a maximum of €4,000; Class II: 40% of the purchase price up to a maximum of €6,000; Class III: 40% of the purchase price up to a maximum of €8,000. The retrofit subsidy also applies to two- and three-wheeled motor vehicles and quadricycles (€1,100).

2.6 Germany

2.6.1 The National Hydrogen Strategy NWS 2020

Purpose	Framework for production, transportation, use and further utilization of hydrogen and thus for innovations and investments.
Overall objective	Installation of hydrogen generation plants with a total capacity of up to 5 GW in Germany by 2030, including the necessary offshore and onshore energy generation. This corresponds to green hydrogen production of up to 14 TWh and a required amount of renewable electricity of up to 20 TWh. If possible, installation of further generation plants up to 5 GW until 2035 or until 2040 at the latest.
Relevance on hydrogen and PtX	The National Hydrogen Strategy provides an action plan that includes further steps and measures to reach the intended goals. It is the basis for the development of future regulations regarding the use/implementation of hydrogen in Germany.
Status	
Implementation into national legislation	Germany: Status June 2020

2.6.2 Updating the National Hydrogen Strategy NWS 2023

Purpose	In particular it provides short-term measures for 2023, mid-term measures for 2024/2025 and long-term measures until 2030 of the National hydrogen strategy.
Overall objective	Increasing the hydrogen installation capacity to 10 GW until 2030. Establishing of 1800 km hydrogen infrastructure/pipeline until 2027/2028. Connection of production, import and storage sites with relevant consumers until 2030. Usage of hydrogen in applications of industry, heavy-duty motor vehicles, air transportation and shipping traffic until 2030.
Relevance on hydrogen and PtX	The National Hydrogen Strategy provides an action plan that includes further steps and measures to reach the intended goals. It is the basis for the development of future regulations regarding the use/implementation of hydrogen in Germany.
Status	
Implementation into national legislation	Germany: Status July 2023

2.6.3 **Draft law (§ 28r EnWG-E), not adopted yet!!** (Gesetzentwurf 26.05.23: Entwurf eines Gesetzes zur Anpassung des Energiewirtschaftsrechts an unionsrechtliche Vorgaben und zur Änderung weiterer energierechtlicher Vorschriften)

Purpose	Plan (draft): Establishing of a hydrogen gas core grid
Overall objective	
Relevance on hydrogen and PtX	
Status	
Implementation into national legislation	Germany: Draft

2.6.4 Bundes-Immissionsschutz-Verordnung (37. BImSchV)

Purpose	Regulates the requirements for definition of “green hydrogen” and increases greenhouse gas quota for green hydrogen.
Overall objective	Definition “green hydrogen”: 100 % renewable energy sources with non-biogenic origin needs to be applied for production of hydrogen. And CO2 emission in the whole process of green hydrogen usage needs to be reduced (at least 70 %). Promotion of green hydrogen utilization in mobility sector by implementation of (higher) greenhouse gas quota for mineral oil companies when they are applying green hydrogen in their refineries.
Relevance on hydrogen and PtX	Promotion of green hydrogen utilization in mobility sector.
Status	
Implementation into national legislation	Germany: 13.12.23: Federal cabinet adopts amendment of 37. BImSchV

2.6.5 Verordnung über die Kosten und Entgelte für den Zugang zu Wasserstoffnetzen (Wasserstoffnetzentgeltverordnung - WasserstoffNEV)

Purpose	Basis for determination of grid costs and for network charges of hydrogen grids
Overall objective	
Relevance on hydrogen and PtX	
Status	
Implementation into national legislation	Germany: Law date of issue: 23.11.2021

Conclusion

The mapping shows that **hydrogen legislation in Europe is rapidly evolving**, driven by the EU Fit for 55 package, national hydrogen strategies, and growing funding support. A common trend is the establishment of regulatory frameworks for hydrogen infrastructure, financial incentives for production and use, and clear targets for electrolysis capacity by 2030-2035.

At the same time, **implementation varies nationally**:

- Some countries (Denmark, France, Germany) have comprehensive strategies with binding targets and major funding.
- Others (Belgium, Netherlands) focus on infrastructure development and targeted subsidies.

The report highlights the **need for harmonisation and standardisation** to enable cross-border hydrogen trade and infrastructure. It also underlines gaps, particularly at the regional level, where deployment depends on local industries and transport needs.

Overall, the legislative landscape is supportive but fragmented, requiring continued alignment across EU, national, and regional levels. This mapping provides the groundwork for identifying regulatory gaps, and opportunities in the LiHyp project.