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Hydrogen governance in the Netherlands

This chapter discusses the institutional and regulatory context for hydrogen risk regulation in the Netherlands. It first discusses the relevant legislation and regulations and on-going regulatory initiatives. It then goes on to discuss the main actors involved and the existing co-ordination platforms at the national and international level. The chapter concludes by discussing the licensing and inspections for hydrogen projects in the Netherlands.

How is hydrogen currently regulated in the Netherlands?

Existing regulatory framework

The foundations of hydrogen policy in the Netherlands have been determined in the 2019 Climate Act and the 2019 Climate Agreement. The Climate Act establishes the target of a 49% reduction in greenhouse gas emissions by 2030, and a 95% reduction and entirely carbon neutral electricity production by 2050, in both cases compared with 1990 levels (Rijksoverheid, 2019^[1]). The Dutch Climate Agreement is a package of measures focusing on achieving those 2030 targets. The measures resulted from roundtable discussions between the government and 150 parties including companies and civil society organisations (Klimaatakkoord, n.d.^[2]). The Ministry of Economic Affairs and Climate Policy (EZK) has a co-ordinating responsibility and safeguards the overall coherence of actions envisaged in the Climate Agreement (Klimaatakkoord, 2019^[3]). On 8 February 2023, The Netherlands improved on its ambitions, by amending the Climate Act to aim for a 55% reduction in greenhouse gas emissions by 2030 and climate neutrality by 2050 (Rijksoverheid, 2023^[4]).

The Climate Agreement establishes the vision for future hydrogen applications in the Netherlands, and this has been further developed in the Dutch hydrogen strategy. The Climate Agreement determines the functions that hydrogen could perform across sectors and announces the start of a substantial “hydrogen initiative” (Klimaatakkoord, 2019^[3]). As a lead-up to this hydrogen initiative, EZK shared a hydrogen vision and policy agenda with the House of Representatives in 2020 which details the government’s hydrogen plans in further detail (Rijksoverheid, 2020^[5]). The hydrogen initiative was formalised in the National Hydrogen Initiative (*Nationaal Waterstofprogramma*, NWP) which started in 2022 (NWP, 2022^[6]).

At the time of writing this report, there is no single comprehensive piece of Dutch legislation that defines all regulatory requirements specifically for hydrogen. Existing rules that are specific to hydrogen mostly focus on industry and related activities such as production and transportation. This is because hydrogen in the Netherlands is, at present, mostly used in industrial processes such as in the chemical sector and oil refining (CBS, 2020^[7]). For new hydrogen applications in the energy transition, most relevant legislation does not consider the specific case of hydrogen, but rather defines general requirements, such as those for dangerous or hazardous substances (as listed in Table 4.2). A few notable exceptions relate to hydrogen use as a fuel for vehicles (see Chapter 5 – “Scenario 5 – Mobility and partially confined spaces: refuelling stations”).

Table 4.1 provides an overview of relevant legislation for the application of hydrogen in the Netherlands.

Table 4.1. Relevant legislation for the application of hydrogen in the Netherlands

Legislative document	Relevance	Scope
Acts		
Spatial planning act (<i>Wet ruimtelijke ordening</i>)	Defines requirements for spatial planning and the development of zoning plans	Production, pipeline transport and refuelling
Act on general provisions of environmental law (<i>Wet Algemene bepalingen omgevingsrecht, Wabo</i>)	Defines requirements for environment permits	Production, pipeline transport and refuelling
Environment and planning act (<i>Omgevingswet</i>)	Defines rules regarding the spatial planning of the living environment	Production, pipeline transport, road transport and refuelling
Transport on hazardous substances act (<i>Wet Vervoer gevaarlijke stoffen</i>)	Defines rules regarding the transport of dangerous substances	Road transport
Gas act (<i>Gaswet</i>)	Defines rules regarding the operation of gas infrastructure and the role of gas grid operators	Pipeline transport
Decrees		
Decree risks major accidents 2015 (<i>Besluit risico's zware ongevallen 2015, Brzo 2015</i>)	Defines requirements for the prevention of major accidents at installations with dangerous	Production

Legislative document	Relevance	Scope
	substances	
Construction decree 2012 (<i>Bouwbesluit 2012</i>)	Defines safety requirements for construction of buildings	Production and refuelling
Decree external safety establishments (<i>Besluit externe veiligheid inrichtingen, Bevi</i>)	Defines external safety conditions for establishments	Production and refuelling
Decree external safety pipelines (<i>Besluit externe veiligheid buisleidingen, Bevb</i>)	Defines external safety conditions specifically for pipelines	Pipeline transport
Decree alternative fuels infrastructure (<i>Besluit infrastructuur alternatieve brandstoffen</i>)	Contains rules relating to the implementation of the European Directive for the development of infrastructure for alternative fuels	Road transport and refuelling
Decree quality living environment (<i>Besluit Kwaliteit Leefomgeving, Bkl</i>)	Defines certain safety distances for hydrogen refuelling stations	Refuelling
Regulations		
Transportation of energy regulation (<i>Regeling energie vervoer</i>)	Defines rules regarding the transportation of energy	Road transport
Norms and guidelines		
The Netherlands norm (<i>Nederlands Norm, NEN-norm</i>) 3650	Defines safety requirements for the design, installation, operation and abandonment of pipeline systems	Pipeline transport
The Netherlands norm (<i>Nederlands Norm, NEN-norm</i>) 17124	Defines quality characteristics of hydrogen fuel dispensed at hydrogen refuelling stations for FCEV	Refuelling
Publication series Dangerous Substances (<i>Publicatiereeks Gevaarlijke Stoffen, PGS</i>) 35	Defines guidelines for the safe use of hydrogen installations to supply hydrogen to vehicles	Refuelling

On-going initiatives

Legislation

The Dutch government is currently developing a new Energy Law. It is envisaged that it will replace the existing Gas act (*Gaswet*) and Electricity act 1998 (*Electriciteitswet 1998*), but it does not include a regulatory framework for hydrogen (Rijksoverheid, 2022^[8]). In a letter to the House of Representatives in December 2020, the Minister of EZK highlighted several on-going initiatives with regard to the development of hydrogen regulation:

- On-going research into the possibility to use the existing gas infrastructure for hydrogen.
- Exploration regarding the market structure of the hydrogen sector.
- Exploration regarding the assignment of temporary tasks to grid operators to pilot hydrogen transport.
- A legislative proposal to implement the revised EU Directive on guarantees of origin.
- The establishment of a working group on a policy framework for hydrogen safety (Rijksoverheid, 2020^[9]).

Since the Minister's letter, progress has been made on a number of topics. In early 2022, the government conducted a public consultation on the market structure for hydrogen (Rijksoverheid, 2022^[10]). In mid-2022, it communicated its intentions to ask the state-owned entity responsible for natural gas transport and storage (*Gasunie*) to develop the hydrogen infrastructure – although the exact role of *Gasunie* still needs to be defined (EZK, 2022^[11]).

Principles and guidelines

EZK is developing its draft principles on the responsible management of safety and health in the energy transition. These include seven principles that policymaking, licensing, communication and supervision should incorporate:

1. for risks that are quantifiable, authorities should define and monitor the safety and health requirements and additional risk mitigation measures, while regulated entities should justify how they comply;
2. precaution will be applied for risks that are uncertain, where the entities will get a degree of freedom in determining how they would like to meet the precaution requirements;
3. the national government will develop guidelines for cases where existing legislation does not cover all aspects of new applications, and will involve stakeholders in the development of the guidelines;
4. pilot projects should be monitored through the development of a monitoring plan, the sharing of findings and the translation of those findings into legislation and regulation;
5. the government communicates proactively and openly on the social benefits and risks of the energy transition and urges other stakeholders to do the same;
6. the response to incidents should allow the drawing of lessons for the future, through evidence-based research;
7. a clear and balanced division of responsibilities will increase the effectiveness of safety policy; this should involve co-operation around, and solutions to, unexpected policy issues.

EZK developed a first version of two hydrogen safety guidelines (*richtsnoeren*), with more guidelines expected to follow (Netherlands Enterprise Agency, 2022^[12]). So far, there is one guideline on general hydrogen safety and a second one on its application to heating in buildings (specifically in relation to four pilot projects). The documents are a response to EZK's commitments to develop a policy framework for hydrogen safety and to develop a temporary policy framework for the safety of hydrogen pilots. While the guidelines are policy documents, they are not official regulations or legislation.

These documents define a number of guiding principles that hydrogen applications should adhere to, including that:

- The application should be at least as safe and healthy as current fossil fuel applications (for hydrogen, these are often natural gas applications), and where there are uncertain risks, precaution should be applied. It is up to the entity to justify how the safety measures result in a sufficient risk reduction.
- Where possible, new applications should be safer and healthier than current fossil fuel applications, but risk reduction above the target should be proportional.
- A comparison with existing reference norms should be made where possible, and where this is not possible, the risk measures should support a sufficient degree of risk management.
- Risk management policy should be based on the best available insights, with new insights swiftly applied.

The safety guidelines refer to the use of hydrogen as a gas, whether or not pressurised. It further provides guidance on different scales of hydrogen application (which can affect the regulations they are subject to), communication on safety risks and monitoring and research of incidents.

Framework for pilots

In 2022, the Authority for Consumers and Markets (*Autoriteit Consument en Markt*, ACM) developed a framework to facilitate pilots for the domestic use of hydrogen. This was done by the regulator to avoid a situation where grid operators and energy retailers need to wait for new legislation before they can pilot

domestic hydrogen applications. EZK has indicated that it will develop a policy framework for the safety of hydrogen pilots, and this is expected before the start of the first pilot (ACM, 2022^[13]). In addition, the ministry has appointed the State Supervision of Mines (*Staatstoezicht op de Mijnen*, SodM) as the supervisory body to supervise the safety of the pilots (SodM, 2022^[14]).

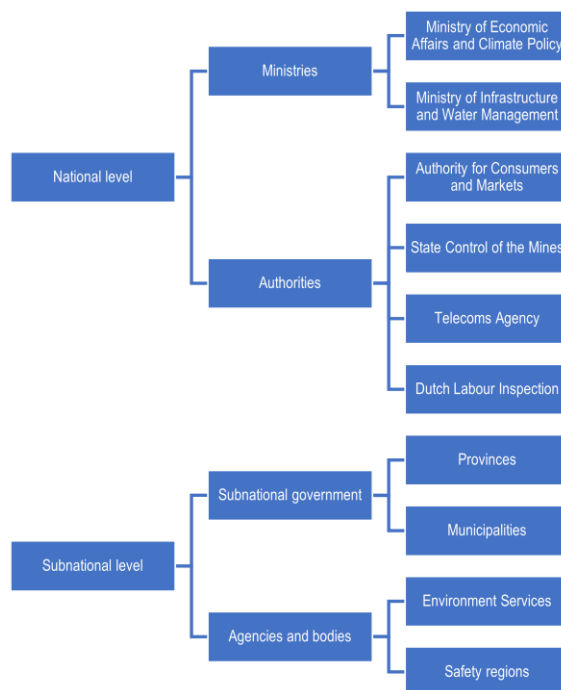
Institutional context

The Netherlands is a unitary state with several layers of government. The national government (*Rijksoverheid*) consists of twelve ministries, each with one or two ministers and one or more secretaries of state that are politically responsible (Rijksoverheid, n.d.^[15]). Regional and local governments function in a hierarchy where the regional and local government are subsidiary to the national government. There are twelve provinces (*provincies*) with responsibility for the spatial layout of the province, including aspects such as the location of business parks and the implementation of regional economic policy. There are 344 municipalities,¹ responsible for matters such as the registration of citizens, the provision of social benefits, local subsidies, schools, certain health care provision, the development of zoning plans, local infrastructure and building supervision (Rijksoverheid, 2022^[16]) (Ministerie van Binnenlandse Zaken en Koninkrijkrelaties, n.d.^[17]). Provincial and municipal authorities have important functions in physical and environmental planning and licensing, based on regulations laid down by central government (OECD, 2010^[18]). The Water Boards (*Waterschappen*) constitute an additional level of government, with responsibilities related to water safety, quality and management (Waterschappen, n.d.^[19]).

Institutional context for hydrogen

The application of hydrogen technologies in the Netherlands involves a wide range of stakeholders, resulting in a complex framework of different bodies (Figure 4.1). Responsibilities to direct, supervise and enforce the use of hydrogen are shared among policymakers and authorities across the three tiers of government (national, regional and local level) (Table 4.2).

Figure 4.1. Institutional framework for hydrogen in the Netherlands



EZK is the ministry responsible for the development of economic, energy and climate policy. There is a Minister of Economic Affairs and Climate Policy (in charge of the ministry) as well as a Minister for Climate and Energy (Rijksoverheid, 2022^[20]). EZK is responsible for the development of the government's vision and policy on hydrogen, as part of its intended transition to a climate neutral society with environmentally sustainable energy sources. The Ministry of Infrastructure and Water Management (*Ministerie van Infrastructuur en Waterstaat*, I&W) is responsible for policy on the use of hydrogen in transport and hydrogen infrastructure.

Table 4.2. Main actors involved in the Dutch hydrogen sector

Institution	Overall function	Role towards hydrogen
Ministries		
Ministry of Economic Affairs and Climate Policy (<i>Ministerie van Economische Zaken en Klimaat</i> , EZK)	Ministry – responsible for economic, energy and climate policy.	Develops the government's vision and policy on hydrogen. Co-ordinates and safeguards the overall coherence of actions within the Climate Agreement, including those related to hydrogen.
Ministry of Infrastructure and Water Management (<i>Ministerie van Infrastructuur en Waterstaat</i> , I&W)	Ministry – responsible for infrastructure and management of waterways.	Develops policy on the use of hydrogen in transport and hydrogen infrastructure.
National authorities		
Authority for Consumers and Markets (<i>Autoriteit Consument en Markt</i> , ACM)	Independent body – responsible for competition oversight, sector regulation and consumer protection.	Regulates and supervises the energy sector. In absence of legislation on the supply of hydrogen to end users, it developed a framework to facilitate hydrogen pilots by energy system operators and energy retailers (ACM, 2022 ^[13]).
State Supervision of Mines (<i>Staatstoezicht op de Mijnen</i> , SodM)	Independent body – responsible for the regulation and supervision of mineral and energy extraction, safety oversight and environmental protection in the energy sector.	Supervises the safety of natural gas network and the quality of the natural gas in networks. SodM is also responsible for the safety supervision for the hydrogen pilots in buildings, which has been granted to the authority as a temporary task (SodM, 2022 ^[21]).
Dutch Labour Inspection (<i>Nederlandse Arbeidsinspectie</i> , NLA)	National agency – responsible for inspections of labour conditions.	Conducts occupational safety inspections (SZW, 2021 ^[22]).
Telecom Agency (<i>Agentschap Telecom</i> , AT)	National agency – responsible for supervision of the digital resilience of essential services such as energy, the use of metering services and the exchange of information on overground and underground networks to prevent excavation damage.	Supervises the law on information exchange overground and underground networks (<i>Wet informatieve-uitwisseling bovengrondse en ondergrondse netten en netwerken</i> , Wibon) to prevent excavation damage, which will be relevant for the deployment of hydrogen pipelines.
Subnational government		
Provinces (<i>provincies</i>)	Regional government – responsible for spatial layout, implementation of regional economic policy, planning, licensing and supervision.	Competent body for the permitting of larger production sites. Holds limited responsibilities for the licensing of hydrogen applications (above five tonnes of storage capacity) (IFV, 2021 ^[23]).
Municipalities (<i>gemeenten</i>)	Local government – responsible among other things for the implementation of local policy, government services, subsidies, benefits, planning, licensing and supervision.	Competent body for the permitting of small production sites. Holds broad responsibility for the licensing of hydrogen applications within their authority remit and for the supervision of construction and housing (<i>Bouw- en woningtoezicht</i>) (IFV, 2021 ^[23]).
Regional agencies and bodies		

Institution	Overall function	Role towards hydrogen
Environment services (<i>omgevingsdiensten</i> , ODs)	Regional agencies – responsible for the environmental licensing, supervision and enforcement in the fields of safety, air, noise, energy, waste and soil, as tasked by municipalities and provinces (Omgevingsdienst NL, n.d. ^[24]).	Assesses licensing requests and issues licences, as assigned by municipalities or provinces.
Safety regions (<i>Veiligheidsregio's</i> , VRs)	Public bodies – responsible for fire prevention and control, disaster and crisis preparedness and management within an area and advice on safety aspects in licensing procedures (Rijksoverheid, n.d. ^[25]).	Provides advice to subnational governments on safety and emergency aspects in hydrogen licensing procedures.
State-owned entities		
Gasunie	State-owned entity – responsible for the operation of the national gas transmission network in the Netherlands through its subsidiary Gasunie Transport Services B.V (GTS), the transmission system operator (TSO) (Gasunie, 2023 ^[26]).	Involved in the development of a future hydrogen transport network, although its precise role has not yet been determined (EZK, 2022 ^[11]). Gasunie repurposed for the first time a natural gas pipeline to transport hydrogen in 2018 and is planning future pipelines (Gasunie, 2018 ^[27]) (Port of Rotterdam, 2022 ^[28]) and a terminal for the import of green ammonia with a connection to the so-called “hydrogen backbone” (Gasunie, 2022 ^[29]).
Gas distribution system operators (DSOs)	State-owned entities – responsible for the operation of regional and local gas distribution systems.	Conducts pilots on the use of hydrogen by residential users (Netbeheer Nederland, n.d. ^[30])

Source: (ACM, 2022^[13]) (SodM, 2022^[21]) (SZW, 2021^[22]) (IFV, 2021^[23]) (Omgevingsdienst NL, n.d.^[24]) (Rijksoverheid, n.d.^[25]) (Gasunie, 2023^[26]) (EZK, 2022^[11]) (Gasunie, 2018^[27]) (Port of Rotterdam, 2022^[28]) (Netbeheer Nederland, n.d.^[30]).

There is a variety of national co-ordination and collaboration platforms on hydrogen in the Netherlands:

- The **roundtable ‘Hydrogen and Green Chemistry’** is chaired by EZK and twice a year brings together executives from companies in the energy, chemical and hi-tech sectors, think tanks and universities (NWO, 2020^[31]).
- The **H2Platform** functions as a discussion platform between EZK, the Ministry of Infrastructure and Water Management (*Ministerie van Infrastructuur en Waterstaat*, I&W), and companies with hydrogen activities (H2Platform, n.d.^[32]).
- **HyDelta**, a national research programme (**HyDelta**) on the implementation of hydrogen (in particular its integration into existing gas infrastructure), brings together grid operators, research institutions and technical experts (HyDelta, n.d.^[33]).
- The **Dutch Hydrogen and Fuel Cell Association** (*Nederlandse Waterstof en Brandstofcel Associatie*, NWBA) is an industry association of companies in the hydrogen sector (NWBA, n.d.^[34]).
- The **Administrative Forum for a Safe Energy Transition in the Netherlands** (*Bestuurlijk Overleg voor een Veilige Energietransitie in Nederland*, BOVEN) is a working group bringing together local government representatives on the topic of the energy transition (Crisislab, 2021^[35]).
- The **Hydrogen Safety Innovation Programme** (*Waterstof veiligheid Innovatie Programma*, WVIP), led by the Dutch Foundation Royal Standards Institute (*Stichting Koninklijk Nederlands Normalisatie Instituut*, NEN) under the H2Platform initiative, brings together industrial parties, ministries, the Institute Physical Safety (*Instituut Fysieke Veiligheid*, IFV), knowledge institutes and local government to develop safety norms (NEN, 2022^[36]).
- The **Environment Services NL** platform brings together the 29 regional environment services (*omgevingsdiensten*, Ods) to co-ordinate and share knowledge (Omgevingsdienst NL, n.d.^[24]).

- The **Safety Council** (Veiligheidsberaad) enables co-ordination between the 25 regional safety regions in the Netherlands (Rijksoverheid, n.d.^[25]).

There is substantial co-ordination and collaboration between the Dutch government and international partners, especially across European Union countries:

- Through the **Pentelateral Energy Forum**, the Netherlands co-ordinates on hydrogen issues with the governments of Austria, Belgium, France, Germany, Luxemburg and Switzerland, developing joint political declarations on hydrogen (Rijksoverheid, 2020^[37]).
- The Dutch government co-ordinates with the **European Commission** to communicate the Dutch hydrogen position and contribute towards shared standards on sustainability, quality, safety, blending of hydrogen in gas networks, market regulation and innovation stimulation.
- **Important Projects of Common European Interest** (IPCEI) is a European instrument that supports the rollout of projects with an important social value, including hydrogen projects in the Netherlands.
- The **Clean Hydrogen Partnership**² is a public-private partnership that contributes to the development of hydrogen technologies by funding research and innovation activities (European Union, 2021^[38]).
- The **Joint Research Centre** is the science and knowledge service of the European Commission, carrying out research to provide independent scientific advice and support to EU policy, including in the area of hydrogen research.
- The **Clean Hydrogen Alliance** is a platform that brings together industry, public authorities, civil society and other stakeholders in six working groups or roundtables to discuss the deployment of hydrogen applications (European Commission, 2022^[39]).
- The **Hydrogen Valley Platform** is a joint initiative by the Clean Hydrogen Joint Undertaking and Mission Innovation, to collaborate and share information on large-scale, flagship hydrogen projects (Hydrogen Valleys, 2022^[40]).
- Beyond the EU, the Netherlands also discusses hydrogen developments through international collaborations such as the **International Partnership for Hydrogen and Fuel Cells in the Economy** (IPHE), the **International Energy Agency** (IEA), the **Clean Energy Ministerial**, the **Clean Energy Ministerial Hydrogen Initiative**, the IEA, the **Hydrogen Technology Collaboration Programme** and **Mission Innovation** (Rijksoverheid, 2020^[5]) (Clean Energy Ministerial, n.d.^[41]) (IEA, n.d.^[42]).

Licensing and inspections for hydrogen activities

Licensing

The Dutch government is planning an overhaul of the relevant legislation related to the spatial planning of the living environment through the enactment of an updated Environment and Planning Act (*Omgevingswet*). It is envisaged that this updated act will bundle, modernise and simplify existing procedures and requirements into one overarching act, thereby replacing a range of existing acts. It also creates a digital one-stop shop that should make it easier to apply for permits and start projects. The Law was accepted by Dutch parliament in 2015 and the Senate in 2016, but its implementation has been repeatedly delayed. On 14 October 2022 it was announced that the implementation date had been postponed to 1 July 2023, to allow for further testing of the new digital system (Rijksoverheid, 2022^[43]). On 26 January 2023, the Dutch government announced the implementation date was further postponed to 1 January 2024 (Rijksoverheid, 2023^[44]). The new Environment and Planning Act will affect the permitting procedures for hydrogen.

Companies that intend to develop any hydrogen activities at a site usually require one or multiple licences that are brought together in the ‘environment permit’ (*omgevingsvergunning*). These relate to aspects that require licences, such as spatial planning, construction and environmental impact. Hydrogen activities are also earmarked as activities that require a separate licence. For most applications, requirements as part of the licensing application include risk assessments, health and safety requirements, integrated environmental obligations and environmental impact assessments (HyLAW, 2018^[45]). Procedures also include an advice by the VR and the enforcement unit within the permit-granting authority. Specific requirements for the different applications of hydrogen are discussed in more detail in Chapter 5.

There are several channels through which hydrogen-based initiatives can get into contact with the authorities, determining the point in time at which authorities first get involved on a project. Hydrogen initiatives can make use of the Environment Desk, which allows them to get into contact with the relevant authorities concerning questions on licensing and to get information on licensing procedures. The Environment Desk is an overarching online portal for all licensing procedures but does not include specific information or checklists for hydrogen initiatives. In other cases, companies may be referred by the municipality.

The authority in charge of issuing permits differs by both regulation and activity. Environment permits are often issued by the local government, based on the “decentralised, unless” (“*decentraal tenzij*”) principle.³ However, facilities that operate with a large quantity of hazardous substances require a permit from the province (IPLO, n.d.^[46]). In certain more exceptional cases, a permit may be needed from the Water Boards (*Waterschappen*) or the national infrastructure agency (*Rijkswaterstaat*), particularly when projects involve surface or ground water or infrastructure (Rijkswaterstaat, n.d.^[47]) (Waterschap Rivierenland, n.d.^[48]). In the case of a production installation or production site, the licensing authority depends on the amount of hydrogen that is stored:

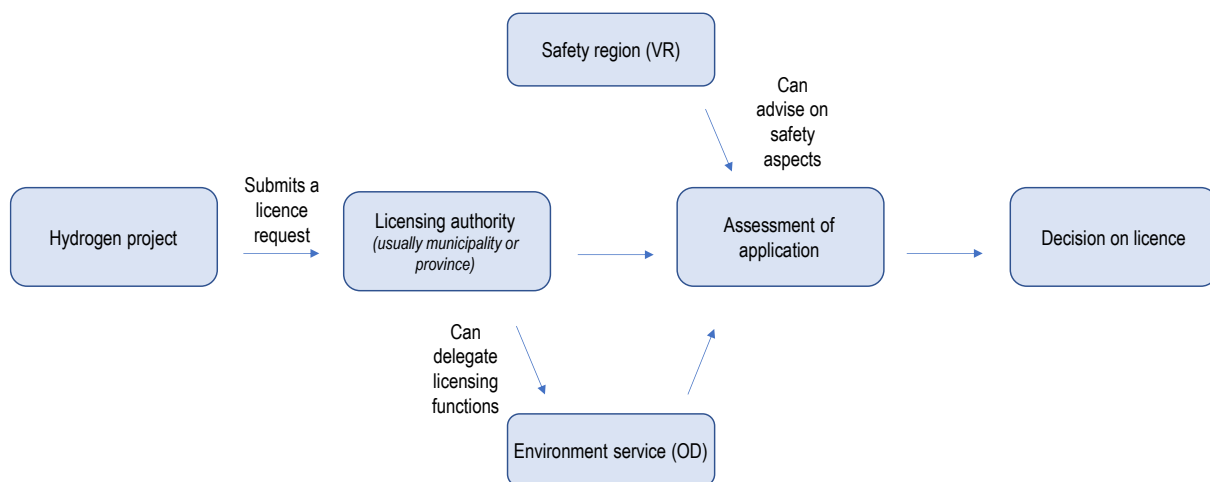
- For installations with quantities of hydrogen storage below five tonnes, the municipality is the relevant authority.
- Installations with quantities of hydrogen storage above five tonnes qualify as Seveso installations, based on EU Directive 2012/18/EU. For such installations, the province is the relevant authority (H2Platform, 2021^[49]).

While municipalities and provinces are the relevant authorities, they often assign licensing, inspection and enforcement functions to the Ods (Figure 4.2). However, the exact roles that are delegated to the OD tend to differ across regions and authorities (Omgevingsdienst NL, n.d.^[24]). As municipalities and provinces are often not obliged to assign licensing and supervision roles to the ODs, they reserve the right to give guidelines regarding the licensing process (Crisislab, 2021^[35]).

Given the absence of an overarching regulatory framework for hydrogen, there is some ambiguity regarding the methods used to assess licensing requests. Ods usually require quantitative risk assessments (QRAs) as part of their licensing procedures, although this may not be necessary in certain cases where the legislation already determines the safety distances for specific activities. Where hydrogen refuelling stations have been granted a licence, this has been done using risk analysis based on a number of sources, including:

- Ministerial memos on calculating risks.
- General requirements from existing legislation such as the Act on general provisions of environmental law (*Wet Algemene bepalingen omgevingsrecht, Wabo*) and the Transport of hazardous substances act (*Wet Vervoer gevaarlijke tiffen*).
- Local and regional expertise and priorities regarding the living environment – taking into account different public interests, such as safety, sustainability, reliability and affordability.

Figure 4.2. Current licensing procedure



Note: While the licensing authority tends to be a municipality or province, in certain cases this may also be another authority, such as the water board or national infrastructure agency. In some cases, a licence request may also be issued directly to the Environment Service (OD), depending on the communication channel used.

Source: Developed by OECD based on available information.

VRs are usually involved in the evaluation of these risk assessments, although this may depend on the agreements on procedures between Ods and VRs. In some cases, VRs are only involved at the later stages of procedures when QRAs are already drawn up. This illustrates that the point in time at which the VR should be consulted may not always be clear or consistent.

The Construction Decree 2012 determines that for buildings not defined as a standard type by the decree – as is the case for hydrogen applications – authorities need to apply a risk-based approach to assess if the application is sufficiently safe. As a guideline to assess the safety, it is sufficient to examine if the safety situation meets the applicable NEN-norms, if these are available. Risks should, in general, not exceed a threshold for the fatality risk of 1 in 100 000 per year for industrial and non-vulnerable objects, and 1 in one million per year for vulnerable objects such as residential buildings and buildings with vulnerable people (EZK, 2022^[50]).

Inspection

The organisation that carries out inspections can differ between regulations. There are environment inspections as well as occupational safety inspections by the Dutch Labour Inspectorate (*Nederlandse Arbeidsinspectie*, NLA). For environment inspections, the rule of thumb is that the licence issuing authority is also responsible for inspection and enforcement (InfoMil, n.d.^[51]). The VRs are responsible for conducting a stocktake of fire, disaster and crisis risks in their region, as well as the preparations for their management.

Regarding domestic use of hydrogen, there appear to be a number of gaps in terms of appropriate supervision. There is no regional structured overview of hydrogen applications for domestic use, which could make it more difficult for fire fighters to assess domestic hydrogen risks within their area.

Conduciveness of regulatory framework

Overall, the development of new hydrogen applications highlights a number of areas within the Dutch regulatory framework for hydrogen that require further attention. With new modes of hydrogen application appearing, existing arrangements and frameworks may not yet provide for sufficient role clarity.

Furthermore, existing regulatory frameworks may not necessarily be effective at addressing and balancing the specific risks of hydrogen. Safety risks from new applications demonstrate themselves at the local level, whereas climate change risks have a more global impact. As safety risks are usually managed at the local level, there could potentially be a stronger focus on safety risks over climate risks. This may not necessarily lead to optimal overall outcomes, as (by making it more expensive, slower, more difficult to site) it could slow down or reduce the deployment of low-emission hydrogen solutions that can counteract climate change risks.

It is essential that new uses of hydrogen be properly foreseen, enabled, and effectively regulated at the same time. As described in more details elsewhere in the report, technical rules need to be adopted that ensure best practices are used in a systematic way, including through “safe by design” installations whenever they are available. At the same time, planning authorities and regulators need to ensure that new hydrogen technologies and uses are effectively enabled, with requirements that are proportionate to the risks and benefits of these innovations, and regulatory processes that minimize unnecessary burden and delays, but rather focus on the essential risk factors. This involves revising zoning and permitting for new hydrogen applications. Incorporating lessons from practice and research, define zoning rules that enable the development of hydrogen in a safe way, and define permitting processes that are risk-proportionate, particularly for lower-risk facilities and uses – for which high-risk industrial permitting requirements are likely to be disproportionately burdensome. It also involves ensuring adequate safety through fit-for-purpose technical requirements informed by science and practice. Enabling zoning and simplified permitting do not mean lower safety – on the contrary, developing specific requirements covering the higher risk aspects of these new hydrogen applications (as discussed further) can help ensure that best practices and techniques are more systematically applied.

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Notes

¹ Number of municipalities as of 24 March 2022.

² The Clean Hydrogen Partnership is the successor to the Fuel Cells and Hydrogen Joint Undertaking (European Union, 2021^[38]).

³ The “decentralised, unless” principle states that in principle, tasks and competences are carried out by municipalities and water boards, unless i) a provincial or national interest cannot effectively be managed by a municipal government or ii) this is required for an effective execution of tasks and competences on the basis of the law or the execution of an international commitment (IPLO, n.d.^[46]).



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