HyLAW

National Policy Paper - Netherlands

Main Authors: Jan Piet van der Meer, Remco Perotti & Françoise de Jong

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1. Introduction and summary

1.1 HyLAW Summary and Methodology

HyLaw stands for Hydrogen Law and removal of legal barriers to the deployment of fuel cells and hydrogen applications. It is a flagship project aimed at boosting the market uptake of hydrogen and fuel cell technologies providing market developers with a clear view of the applicable regulations whilst calling the attention of policy makers on legal barriers to be removed.

The project brings together 23 partners from 18 countries; Austria, Belgium, Bulgaria, Denmark, Finland, France, Germany, Hungary, Italy, Latvia, Norway, Poland, Romania, Spain, Sweden, Portugal, the Netherlands and United Kingdom and is coordinated by Hydrogen Europe.

Through extensive research, interviews and legal analysis, the HyLaw partners have identified the legislation and regulations relevant to fuel cell and hydrogen applications and legal barriers to their commercialization.

This National Policy Paper provides public authorities with country specific benchmarks and recommendations on how to remove these barriers.

1.2 Policy Summary at National level

Energy is one of the primary necessities of life. In our daily life we use energy for **heat**, **electricity**, and **mobility**. Hydrogen fulfills a system function in the essence of this energy infrastructure; hydrogen can be highly efficiently stored, transported and distributed at low cost. For now, Hydrogen is mainly used as a building block or feedstock for (among others) the chemical industry.

Hydrogen is a central pillar of the energy transformation required to limit global warming to two degrees Celsius (Paris 2015)[1]. The Dutch government signed the Paris Agreement in 2015 and is now preparing the Dutch Climate Agreement to fulfil the Paris Agreement. In the Draft Climate Agreement Hydrogen is considered an important energy carrier for all transition paths[2]. Within this Agreement the role of hydrogen is seen as cross-sectoral solution for a climate neutral society.

The energy transition needs to be facilitated by regulations and standards for, among other things; safety, interoperability and compatibility. Electricity and gas cannot be seen separately anymore: the energy system needs to be considered as one integrated system. This requires integrated accompanying legislation – law proposals such as "STROOM" and "Wet Voortgang EnergieTransitie" (VET / English: Law Continuation Energy Transition) intended to accomplish this. One main point of discussion remains the authority of the electricity and gas network operators. Their scoped authority limits interoperability and integration (e.g. energy storage, power-to-gas and gas-to-power). Unfortunately there is no consensus on the scope of the authority yet.

To stimulate the hydrogen infrastructure, which empowers an efficient green and renewable energy system in line with the goals of the upcoming Climate Agreement (Klimaatakkoord), we recommend the Dutch policy makers to agree on an integrated energy transition policy.

We have distinguished legal and administrative barriers and provided corresponding policy recommendations for the following issues:

- Production of Hydrogen
- Electricity grid issues
- Gas grid issues
- Transport and distribution of Hydrogen by road
- Hydrogen as a fuel and refueling infrastructure for mobility purposes
- Vehicles

[1] Hydrogen Council: Hydrogen scaling up – a sustainable pathway for the global energy transition (November 2017)

[2] Climate Agreement news

2. Production of Hydrogen

Production of Hydrogen in the Netherlands is mature and developed, and has been done for over 50 years. Hydrogen is mainly produced by the chemical and the petrochemical industry (centralized production[3]). Hydrogen is used as a feedstock (a chemical element) and since recent years as an energy carrier. The quantities are large – and several production centers are connected with dedicated hydrogen pipelines. Hydrogen production in the Netherlands is the second largest production of Europe, after Germany. Most of the Hydrogen in the Netherlands is being produced from natural gas. One of the main objectives in the energy transition is to produce hydrogen from renewable energy resources: green hydrogen.

Localized production concerns the production of hydrogen for a given application on the same location, eliminating the need to transport the hydrogen outside the facility. Localized production of hydrogen in the Netherlands is in its infancy phase. The coming years this might develop into a mature business.

2.1. Overview and assessment of current legal framework

This paragraph describes the legal and administrative barriers for the Netherlands, recommendations based on these barriers are described in paragraph 2.3.

Link to database

Centralized production of Hydrogen: Permitting process

A hydrogen production plant is considered as a traditional chemical production facility, without regard to the type of Hydrogen production (PEM, alkaline, reforming…) or the presence (or absence) of hazardous substances involved in the process. This places a disproportionate burden on environmentally friendly production methods, as it subjects them to the same requirements as industrial, emission emitting processes. There is no specific legislation for hydrogen production and it is considered as any other inorganic gas production facility. This increases the costs for developers and delays the deployment of hydrogen technology.

Localized production of Hydrogen (Electrolysis, Steam-Methane reforming, and H2 liquification):

Localized hydrogen production and storage is legally considered as hydrogen production in general, regulated by the European Commission[4]. The production and storage of hydrogen, as an industrial gas, is considered a chemical process involving emissions. Emissions are not relevant when hydrogen is produced via electrolysis. However, production of hydrogen by electrolysis is not distinguished from other means of producing hydrogen. This hinders e.g. the deployment of Hydrogen Refueling Stations with localized hydrogen production. This consequently creates permitting barriers for simplified processes (in Dutch: '*reguliere proces*', as opposed to '*uitgebreide proces*') , zoning, and permitting requirements.

- **Simplified process**

[3] Centralized production refers to the production of the hydrogen at one location, in quantities to cover the needs of hydrogen over a relatively large geographic area for a relatively large number of points of use, implying hydrogen transportation

[4] - Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (EIA)

- Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (SEA)

- Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (IED)

- Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances (SEVESO)

- NACE Classification Codes. NACE (Nomenclature des Activités Économiques dans la Communauté Européenne) is a European industry standard classification system similar in function to Standard Industry Classification (SIC) and North American Industry Classification System (NAICS) for classifying business activities. http://ec.europa.eu/eurostat/documents/3859598/5902521/KS-RA-07-015-EN.PDF

(in the Netherlands a “simplified process” is referred to as a “regular procedure”)

Hydrogen production is legally considered as hydrogen production in general. In the Netherlands there is no legal or administrative distinction between localized and centralized hydrogen production. Therefore it is always necessary to apply for the “extended WABO procedure”. This increases the costs for developers. This leads to disproportional requirements for localized production facilities.

- **Land use plan (zone prohibition)**

A land use plan refers to the legal requirements for building a localized hydrogen production facility (including potential zone prohibition), identifies the authority responsible for delivering the land use permit, gives an estimate of the time needed to change the land use plan, and finally highlights if the permit process is uniform throughout the country. Because hydrogen production is legally considered as hydrogen production in general, such activity would only be permitted in an area designated as an industrial zone or, in under specific conditions in commercial areas.

- **Permitting requirements**

Hydrogen production is legally considered as hydrogen production in general. As a result, hydrogen production permitting requirements will be subject to:

– Risk Assessments (SEVESO)

– Health and Safety requirements (ATEX)

– Integrated Environmental obligations (IED)

– Environmental Impact Assessment procedures (SEA and EIA)

The above-mentioned requirements mean that the development of small production units is as complicated as large units. This severely limits the potential for development of localized production units, including Hydrogen Refueling Stations with on-site production. Because of this complexity this leads to non-uniformity in the processing and interpretation of requests.

2.2. Conclusions

The main conclusion regarding the barriers for production of hydrogen is that localized hydrogen production is legally considered the same as large scale (centralized) hydrogen production.

For localized production facilities this means that they are required to meet the same requirements as centralized large scale hydrogen production facilities. This consequently affects: the permitting process, zoning, and permitting requirements. This restrains (e.g.) Hydrogen Refueling Stations from on-site hydrogen production. This hinders the development of the hydrogen refueling infrastructure (for mobility).

Centralized and localized production of hydrogen is legally considered traditional chemical production. When producing hydrogen through electrolysis this places a disproportionate burden on environmentally friendly production methods, as it subjects them to the same requirements as industrial, emission emitting processes – especially for localized production facilities.

2.3. Policy Recommendations

We recommend to change the obligations for localized (small scale electrolyse) hydrogen production on a European and national level. Localized (small scale) production should be distinguished from larger scale production through a definition of small scale production (e.g. 400 KG per day). This should also imply the applicability of the regular permitting process and may avoid zoning prohibitions for localized hydrogen production.

For production of hydrogen it is advised to streamline existing regulation (at EU[4] and national level). The EU Directives have been designed to regulate large scale, chemical, emission emitting industrial processes but end up applying also to large ánd small scale, **non-emitting processes**. The national permitting requirements draw heavily on obligations established at EU level.

As an unintended effect, the obligations prescribed in these Directives inhibit the deployment of environmentally friendly production methods such as electrolysis (despite their potential to reduce overall carbon emissions and low environmental risk) and increase the overall costs and time required for permitting through the imposition of complex obligations even when hydrogen is produced (and stored) in small quantities.

2.4. Related legislation

Applicable legislation	Besluit risico's zware ongevallen 2015 (Decree on the risks of serious accidents)
Source	http://wetten.overheid.nl/BWBR0036791/2015-07-08
Relation/link with European legislation	The BRZO 2015 (Decree on the risks of serious accidents) implements the European Seveso III Directive in the Netherlands.
Scope of relevant part(s)	In the case of intended constructions, the municipality must check whether this affects the External Safety in that area. This is done by testing the land use plans to the BEVI, the External Safety Establishments Decree. It must also be assessed whether the zoning plan can allow planned developments. The BEVI, the Decree on External Safety Devices, stipulates that all BRZO companies are subject to BEVI.

Applicable legislation	Wet ruimtelijke ordening Wro (Spatial Planning Act)
Source	http://wetten.overheid.nl/BWBR0020449/2016-04-14

Applicable legislation	Wet algemene bepalingen omgevingsrecht Wabo (General provisions environemntal legislation act)
Source	http://wetten.overheid.nl/BWBR0024779/2016-07-01
Scope of relevant part(s)	Permits for land use are part of the WABO

Applicable legislation	Omgevingswet (Environmental Act)) not applicable yet
Source	https://zoek.officielebekendmakingen.nl/dossier/33962/stb-2016-156?resultIndex=15&sorttype=1&sortorder=4
Scope of relevant part(s)	Permits for land use are part of the Omgevingswet

Applicable legislation	Besluit externe veiligheid inrichtingen Bevi (Decree on safety of devices)
Source	http://wetten.overheid.nl/BWBR0016767/2016-01-01
Relation/link with European legislation	The BEVIstipulates that all BRZO companies are subject to BEVI. The BRZO is the Dutch implementation of the European Seveso III Directive
Scope of relevant part(s)	In the case of intended constructions, the municipality must check whether this affects the External Safety in that area. This is done by testing the plans to the BEVI, the External Safety Establishments Decree. It must also be assessed whether the zoning plan can allow planned developments

Relation/hierarchy

The general provisions environmental legislation act (Wabo) came into effect in 2010 and will eventually be included in the Environmental Act. The Wabo includes several acts as the Wro and the wet milieubeheer (environmental Conservation Act). The Wabo will be replaced by the Omgevingswet (Environmental Act) in due time (expected 2021). The WABO is already one stop[shopping for a permit but will be even more increased by the Omgevingswet. The "Omgevingswet" (Environmental Act) is umbrella legislation which incorporates several acts, among which laws for:
- construction
- destruction
- environment
- flora/fauna

- mining
The WABO and Omgevingswet are national regulations.

An important note:
It is of high importance that in the RED2 the use of renewable energy not only is addressed for direct use but also indirect use of green energy: production of green hydrogen

Green Hydrogen is not fully integrated as green energy carrier in European and national directives this has its impact on subsidy and stimulations packages The fact that indirect use of renewable energy qualified hydrogen as grey limits the market value of the this hydrogen. Developing a hydrogen gas network than it has a higher public impact than a private impact. It would be beneficial if the access to hydrogen pipeline infrastructure is public instead private.

3. Transport and distribution of hydrogen by road

The transport of Hydrogen by road (in the form of gas tanks, metallic cylinders and composite vessels – in gas, liquid or solid phase) is important for the deployment of the hydrogen energy infrastructure: such as supplying hydrogen to Hydrogen Refueling Stations or hydrogen for industrial purposes (e.g. the glass industry). As long as hydrogen is transported by road, the use of tunnels is essential. Safety in tunnels is the key factor determining the passage of hydrogen by road. Transparent and uniform regulations for transporting hydrogen through Dutch tunnels are recommendable.

In the Netherlands we refer to the ISO standards for technical and safety requirements of cylinders and tubes. The transport and distribution of hydrogen is well developed and well regulated.

3.1. Overview and assessment of current legal framework

This paragraph describes the legal and administrative barriers for the Netherlands, recommendations based on these barriers are described in paragraph 2.3.

Link to database

Restriction of road transport (e.g. tunnels or bridges).

Restrictions on road transport of hydrogen take form in the requirements regarding tunnels, bridges, parking and others.

This barrier could have an impact on the logistics of bulk transport of H2 on road. The international transport of hydrogen by cylinders, tubes, trailers and tank-vehicles is subject to the provisions of ADR[5]. The ADR classifies hydrogen as category B/D, which means transport of hydrogen in tanks is forbidden through tunnels of category B, C, D and E. In the Netherlands, this means that hydrogen in tanks can only be transported through five tunnels[6]:

- Roertunnel
- Schipholtunnel
- Swalmentunnel
- Leidsche Rijntunnel
- Willem-Alexandertunnel

The categorization of these tunnels is primarily motivated by the protection of the tunnel. For example, tunnels under a waterway are category C. This is because a large or very large explosion could lead to the loss of the tunnel, with all social damage. For example, failure of the structure in such a tunnel means that it fills with water, after which the large weight of the water leads to the failure of the foundation of the tunnel (most tunnels under a waterway are sunken tunnels, without pile foundation). This would leave a tunnel wreck that cannot be repaired and cannot be removed without very high costs. A new tunnel must therefore be built next to the wreck, whereby all procedures must be completed again, starting from the plan study phase – which would take 5 to 10 years. Category C is chosen in order to exclude these risks.

In the case of land tunnels (covered roads) there is usually no reason to impose restrictions on the transport of hazardous substances, because the damage can be repaired in the event of an explosion or fire (and the damage does not lead to the loss of the entire tunnel). Based on this principle, bulk transport of hydrogen cannot take place through tunnels under a waterway.

3.2. Conclusions

When constructing a hydrogen production facility it is imperative to review the existing and current legislation regarding its surrounding tunnel network, in order to avoid unnecessary logistics issues.

[5] Accord européen relatif au transport international des merchandises Dangereuses par Route

[6] www.ilent.nl/onderwerpen/gevaarlijke-stoffen-vrachtwagen/regels-tijdens-vervoer-gevaarlijke-stoffen-over-de-weg/tunnels

3.3. Policy Recommendations

The provisions for transport of dangerous goods by road are standardised in ADR and implemented in all partner countries through harmonised transposition of Directive 2008/68. The hydrogen is treated in the same way as other flammable gases and therefore no recommendations for change of the existing legal an administrative framework could be made.

3.4. Related legislation

Applicable legislation	Transport on hazardous substances (Annex 2 article 3 Wet Vervoer gevaarlijke stoffen (Annex 2 article 3
Source	http://wetten.overheid.nl/BWBR0007606/2015-04-01
Relation/link with European legislation	Tie WVGS is the Dutch implementation of the ADR
Scope of relevant part(s)	This law applies to: a. the transport of dangerous goods with a means of transport by land, rail and inland waterways; b. the provision and acceptance of hazardous substances for transport by means of a means of transport by land, rail and inland waterways; c. to leave and to leave a means of transport in or on which dangerous substances or residues thereof are located; d. loading a container or means of transport with dangerous substances and unloading those substances for the transport; e. the deposit of hazardous substances during transport; f. the packing of hazardous substances for the transport thereof; g. filling a designated container, tank, packaging or means of transport with dangerous substances and unloading those substances for the transport; h. the operation of a container, tank, packaging or means of transport for the transport of dangerous goods; i. receiving hazardous substances during or following the transport; j. the other actions directly related to the transport of dangerous goods, including the security of the transport chain, insofar as this is laid down by or pursuant to a general administrative order as referred to in Article 3, rules

Applicable legislation	Law transport of dangerous goods
Source	http://wetten.overheid.nl/BWBR0007606/2015-04-01
Relation/link with European legislation	ADR and Seveso

Applicable legislation	Arrangement of land transport of hazardous substances Regeling vervoer over land van gevaarlijke stoffen
Source	http://wetten.overheid.nl/BWBR0010054/2017-08-01
Relation/link with European legislation	ADR and Seveso
Scope of relevant part(s)	Conducting hazardous substances referred to in Appendix 1 conditionally to land transport as referred to in Annex 1, the operations referred to in Article 2 of the Decree on the transport of dangerous goods may be carried out, provided that the provisions of these regulations are observed

Applicable legislation	Basic network regulation Regeling basisnet
Source	http://wetten.overheid.nl/BWBR0035000/2016-12-01
Relation/link with European legislation	National law ADR and Seveso
Scope of relevant part(s)	The roads, main railways and inland waterways listed in Annex I, Annex II and Annex III respectively are the roads, main railways and inland waterways as referred to in Article 13, first paragraph, of the Act

Applicable legislation	Law of environmental conservation
Source	http://wetten.overheid.nl/BWBR0003245/2017-08-30

Applicable legislation	AMVB
Source	https://www.parlement.com/id/vh8lnhrsd1rk/algemene_maatregel_van_bestuur_amvb
Relation/link with European legislation	ADR and Seveso
Scope of relevant part(s)	Transport of dangerous goods

Relation / hierarchy

Law:

The Transport of Hazardous Goods Act is the umbrella legislation concerning the transport of dangerous goods.

the Environmental Management Act and the Wet Safety Regions also concern road planning.

- Decree on external safety of transport routes: falls under multiple laws such as Transport of Hazardous Substances Act, Environmental Management Act, Safety Regions Act, General Environmental Law Act, and Spatial Planning Act.Besluit externe veiligheid transportroutes: falls under multiple laws such as Wet vervoer gevaarlijke stoffen, Wet milieubeheer, Wet veiligheidsregio's, Wet algemene bepaling omgevingsrecht, and Wet ruimtelijke ordening.

- Decree on transport of dangerous goods: falls under Wet vervoer gevaarlijke stoffen.

Regulation:

- Land transport regulations for hazardous substances: comes forth from the Road Traffic Act and the Transport of Dangerous Goods Decree.
- Basic grid regulation: falls under the Transport of Hazardous Substances Act and Decree on external safety of transport routes.

Standards:

- PGS15: Guidelines concerning the storage of packed dangerous goods, refers to ADR, Wet milieubeheer, Wet vervoer gevaarlijke stoffen, and others.

4. Hydrogen Fuel Cell Electric Vehicles

In 2018 in the Netherlands there are 40 Hydrogen Fuel Cell Electric Vehicles (FCEV) with registered license plates. Indicative 100 FCEVs have been sold in Q2-Q3 2018, to be delivered in Q4 of 2018 and Q1 of 2019. Various Original Equipment Manufacturers (OEMs) produce FCEVs for the European market. New models are expected in 2019 – 2020.

Five buses, a few garbage trucks and some special vehicles (e.g. street sweepers) are operational. In 2019 50 new buses are expected to be operational in three regions within the Netherlands. For light commercial vehicles and heavy duty vehicles development is ongoing.

The 2020 Olympic Summer games in Japan will be fully dedicated to the use of hydrogen as an energy carrier; great implications are expected for the hydrogen (mobility) infrastructure and it will therefore boost the use of Hydrogen Fuel Cell Electric vehicles.

Shipping and the maritime industry are very important for the Netherlands – developing regulation which allows Hydrogen to be used as an energy carrier in ships is of great importance for this economical sector. Hydrogen in the Netherlands is classified as a "low flashpoint fuel" (such as LNG and (compressed) natural gas), even though the energy density of hydrogen differs from LNG and (compressed) natural gas. As a result, rules for hydrogen are too strict, costly and time-consuming.

4.1. Overview and assessment of current legal framework

Cars, buses, trucks and light commercial vehicles

- **Type Approval Process**

Type approval and individual vehicle registration is not a regulatory barrier in the Netherlands, because the process is the same as for conventional vehicles. It is however very costly to obtain a European type approval and therefore less attractive. For example, type approval for a bus could cost up to €250.000. For a component such as a tank it already adds up to €30.000. It is less costly when using certified components; then the type approval is only needed for the system as a whole.

- **Restrictions**

The lack of guidelines and codes regarding use of FCEV's, buses and trucks in confined environments (e.g. tunnels, parking garages, service maintenance points, etc.) in the Netherlands may cause safety issues and also creates a sense of insecurity. A good risk-analysis is necessary, studies are ongoing. In addition, at this moment FCEV's are not distinguishable from other vehicles for emergency services.

- **Incentives**

The current (until 2021) incentive-scheme in the Netherlands is as follows:

  - tax and registration fee reductions and exemptions
    - Value Added Taxes: 21%
    - Taxation of passenger cars and motorcycles (in Dutch: Belasting van Personenauto's en Motorrijwielen (BPM)): 0%
    - Road Taxes for heavy duty and personal vehicles 0%
    - Excise Duties: 0%
    - No repurchase guarantees
    - Additional Income Tax Liability (Dutch: Bijtellingsregeling): 4%
    - Environmental Investment Allowance (In Dutch: Milieu Investeringsaftrek (MIA)): 36%
    - Random Depreciation Environment Investment (In Dutch: Willekeurige Afschrijving Milieu Investering (VAMIL)): 75%
    - Tax Heavy Motor Vehicles (Belasting Zware Motorrijtuigen (BZM)): 0%
  - purchase grants and green or white certificates (subsidies)

- toll charges exemptions
- public procurement rules for acquisition of low emission vehicles
- privileges for FCEVs such as access to bus/tram lines and free/reduced parking in public parking spaces

4.2. Conclusions

There is a general lack of Regulations, Codes and Standards in the field of vehicle mobility in the Netherlands, such as regulation regarding parking and tunnels. This may cause safety issues and a sense of insecurity. Also, incentives for employers and consumers are lacking (e.g. purchase incentives).

International codes and standards on vehicle homologation will change over time, being more connected to US and other standards. This might change the EU regulations as well. We have to follow these changes.

4.3. Policy Recommendations

We recommend to stimulate zero emission vehicle usage by lowering the Total Cost of Ownership (TCO) of Hydrogen FCEV to the current equivalent of the TCO for Diesel and Petrol vehicles. We recommend to continue the incentivizing measures and to add a purchase incentive (especially for employers) making the cars VAT-free for the private market (VAT = VAMIL+MIA). These temporary encouragements are expected to become redundant between 2025 and 2030 – because of the growth of the FCEV market and its uptake.

We recommend investigating (and developing) Regulations, Codes and Standards for confined spaces (e.g. parking places) and tunnels for Hydrogen FCEV cars, buses, trucks and ships (“bunkering”, maritime and inland shipping) – which we can subsequently analyze in HyLAW 2.

4.4. Related legislation

Applicable legislation	Wegenverkeerswet 1994 (Road Traffic Act)
Source	http://wetten.overheid.nl/BWBR0006622/2017-07-12
Scope of relevant part(s)	The Road Traffic Act 1994 (Wvw) forms the basis for all traffic regulations. The starting point here is the smoothness and flow of traffic, and that no one should cause hindrance or danger on the road.

Applicable legislation	Regeling voertuigen Vehicle regulations) Regulations implementing chapters III and VI of the 1994 Road Traffic Act.
Source	http://wetten.overheid.nl/BWBR0025798
Relation/link with European legislation	Refers to numerous EU legislations and guidelines e.g.: Directive 70/157 / EEC: Council Directive 70/157 / EEC of 6 February 1970 on the approximation of the laws of the Member States relating to the permissible sound level and the exhaust system of motor vehicles (OJEC 1970, L 42); Directive 2007/46 / EC: Directive 2007/46 / EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers and of systems, components and separate technical units intended for such vehicles intended (PbEU 2007, L 263); Regulation (EU) 167/2013: Regulation (EU) No 167/2013 of the European Parliament and of the Council of 5 February 2013 on the approval and market surveillance of agricultural and forestry vehicles (OJ 2013, L 60); Regulation (EU) 168/2013: Regulation (EU) No 168/2013 of the European Parliament and of the Council of 15 January 2013 on the approval and market surveillance of two or three-wheel vehicles and quadricycles (OJ 2013, L 60).
Scope of relevant part(s)	In the new Vehicles Regulation the requirements are set for the various vehicles. In chapter 5 of these regulations, the vehicle requirements must be specified for each vehicle type.

Relation/hierarchy

Law:
The Wegenverkeerswet 1994 is the umbrella legislation that forms the basis for traffic regulation.

Regulation:
Regeling voertuigen; extensive regulation that concerns the technical demands of vehicles. It refers to numerous EU-legislations and guidelines.

5. Electricity grid issues for electrolysers

To reach the emission goals (Paris 2015) a substantial increase of renewable energy production is required. A large amount of renewable energy comes from solar and wind energy –of which supply is intermittent. An example: during ten to twelve weeks in winter there is a lack of wind and solar energy to heat households and industry and supply them of electricity from renewable sources. During this time hydrogen stored during the summer can efficiently meet the shortage of heat and electricity. TSOs need the flexibility to convert both power-to-hydrogen and hydrogen-to-power. This is the only large-scale renewable energy answer to the energy needs we have. An optimal balance between the supply and demand of energy is essential – this requires the storage of green energy. The principal of connecting electrolysers to the e-grid in the Netherlands is matured technology. For instance the Proton-exchange membrane electrolysers (PEM) has been active for over 25 years. In the Netherlands connecting an electrolyser to the e-grid is possible as long as the grid connected equipment (e.g. electrolyser) is able to meet the grid services requirements (e-TSO (TENNET) and e-DSO (e.g. Enexis)).

5.1. Overview and assessment of current legal framework

Connection of the E-grid to the electrolyser: legal status of power-to-gas plants and energy storage facilities (energy consumer or energy producer)

An electrolyser connection is not treated differently to connection of conventional electricity consuming equipment. Therefore there is no apparent barrier except for the fact that E-grid TSOs and DSOs are not allowed to store power (in the form of power-to-gas and gas-to-power – and gas-to-mobility). A modernized energy regulation (interoperability) system is needed.

5.2. Conclusions

Electricity TSOs and DSOs are solely allowed to transport and distribute electricity; no other activities (e.g. trading, storing, or producing) are allowed. This hinders the development of an integrated energy system, where power is converted into gas and vice versa (for e.g. storage, grid balancing purposes).

5.3. Policy Recommendations

We recommend renewing and combining the existing (old) electricity and gas laws into a new Energy Law – which enables TSOs, (DSOs), e-TSOs and (e-DSOs) to produce, store, trade and distribute hydrogen and electricity - in a way the market demands it. The way this could be organized is to bring the energy TSOs under one juridical entity. This implies a needed change in European Network Codes – enabling these new activities (produce, store, trade, transport and distribute) of the various DSOs and TSOs.

Investigate implications (and Regulation Codes and Standards) for local energy corporations (producing electricity and delivering it back to the grid – and using a local electrolyser to store power in the form of hydrogen)

5.4. Related legislation

Applicable legislation	Elektriciteitswet 1998
Source	http://wetten.overheid.nl/BWBR0009755/2016-07-01

Applicable legislation	Gaswet
Source	http://wetten.overheid.nl/BWBR0011440/2016-07-01

Applicable legislation	Wet opslag duurzame energie
Source	http://wetten.overheid.nl/BWBR0032660/2017-01-01

Applicable legislation	Besluit risico's zware ongevallen 2015
Source	http://wetten.overheid.nl/BWBR0036791/2015-07-08

Applicable legislation	Wet ruimtelijke ordening
Source	http://wetten.overheid.nl/BWBR0020449/2016-04-14

Relation/hierarchy

Law:
The Gaswet and the Elektricititeitswet 1998 are two umbrella legislations concerning power-to-gas plants and energy storage facilities.

The Wet opslag duurzame energie concerns the storage of sustainable energy.

The "Omgevingswet" (Environmental Act) is umbrella legislation which incorporates several acts, among which laws for:
- construction
- destruction
- environment
- flora/fauna
- mining

An important note:
It is of high importance that in the RED2 the use of renewable energy not only is addressed for direct use but also indirect use of green energy: production of green hydrogen