

HyLAW

National Policy Paper - <Poland>

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Table of contents

TABLE OF CONTENTS.....	3
1. INTRODUCTION AND SUMMARY.....	4
1.1 HyLAW Summary and Methodology	4
1.1 Policy Summary at National level	4
2. ELECTRICITY GRID ISSUES FOR ELECTROLYSERS.....	5
2.1. Overview and assessment of current legal framework	5
2.2. Conclusions	5
2.3. Policy Recommendations	5
3. GAS GRID ISSUES.....	6
3.1. Policy Summary at National level	6
3.2. Overview and assessment of current legal framework	6
3.3. Conclusions	6
3.4. Policy Recommendations	7
4. HYDROGEN AS A FUEL AND REFUELING INFRASTRUCTURE.....	8
4.1. Policy Summary at National level	8
4.2. Overview and assessment of current legal framework	8
4.3. Conclusions	9
4.4. Policy Recommendations	9
5. PRODUCTION OF HYDROGEN.....	10
5.1. Policy Summary at National level	10
5.2. Overview and assessment of current legal framework	10
5.3. Conclusions	10
5.4. Policy Recommendations	10
6. STATIONARY POWER, FUEL CELLS, AND OTHER ISSUES	12
6.1. Policy Summary at National level	12
6.2. Overview and assessment of current legal framework	12
6.3. Conclusions	12
6.4. Policy Recommendations	12
7. STATIONARY STORAGE: GAS/LIQUID/METAL HYDRIDE.....	13
7.1. Policy Summary at National level	13
7.2. Overview and assessment of current legal framework	13
7.3. Conclusions	13
7.4. Policy Recommendations	14

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 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.

1.1 Policy Summary at National level

Currently hydrogen is produced in high amount in Poland as a byproduct from various gas processing mechanisms. Unfortunately, the electrolysis technology is not used on the industrial scale. Although there are no Power to Gas plants in Poland, together with absence of proper legislation, such installations should follow the same procedures as other industrial units, in order to be connected to the electrical grid.

In Poland, access to the electrical grid for the industrial systems (also potential electrolysis and other gas processing installations) is guaranteed by national Energy Law, Article 7 (Dz. U. z 2012 r. Nr 1059 z późn. zm.) and the European Union Directives and Regulations:

- Directive 96/92/EC,
- Directive 2003/54/EC,
- Directive 2009/72/EC,
- Directive 2009/73/EC,
- Regulation (EC) No 714/2009,
- Regulation (EC) No 715/2009,
- Regulation (EC) No 713/2009.

2. Electricity grid issues for electrolysers

2.1. Overview and assessment of current legal framework

At present, there are no electrolysis-based installations on the industrial scale in Poland. Additionally, in Polish national Energy Law, there are no specific legal regulations concerning Power to Gas systems. This issue has yet to be specified in the future legal framework, also about connecting electrolysers to the e-grid, thus new barriers might appear. Currently there are no significant differences between connecting an electrolyser or other installations of a similar load demand to the electric grid. Just like for the other Member States, the authority responsible for this is the local Distribution Network Operator (DNO) at the location where the electrolyser plant will be placed. For the Poland, this issue is described in the national Energy Law, Article 7 (Dz. U. z 2012 r. Nr 1059 z późn. zm.).

In order to connect the target installation to the electrical network, a specific procedure has to be followed. In the first step, the application for connection conditions has to be delivered to the DNO. Upon receiving the positive response, the DNO will determine the connection conditions for the potential Power to Gas installation and prepare proper agreement, which will include the schedule and all legal aspects that has to be met during the connecting process and installation exploitation. In the situation when the installation power output exceeds 5 MWe, additional expertise is required, in order to determine its influence on the overall, local power system. According to Polish Energy Law, the specific connection conditions are valid for 2 years.

Upon signing the e-grid connection agreement, the DNO is obligated to deliver electricity to the target installation. Although this procedure has simplified during the years, currently there is lack of legal regulations concerning the final usage of electric power for the Power to Gas purposes, i.e. the generation of hydrogen that will be distributed into the gas network and storage systems. Powering the potential Power to Gas units will probably require additional legal aspects to be implemented in the national Energy Law, also on the electrical grid connection level.

2.2. Conclusions

Taking into account the permitting process (environmental, operational and building), Poland belongs to a group of countries where legal and administrative procedures are missing. There are no instructions defining in detail the process and recommendations that should be followed. Currently, Poland has only a set of standards that provide guidelines on the technical aspects related to the usage and safety of hydrogen as a fuel (energy carrier). Unfortunately, according to the current law, their use is voluntary.

2.3. Policy Recommendations

- Wide scale implementation of the 'energy package' legislative framework and associated Directives.
- Specification of legal definition for the Power to Gas installations in the Polish Energy Law, also describing procedures and barriers concerning its connection to the national electrical grid.
- Extension of safety requirements concerning the connection and exploitation of DNO's electric equipment with the Power to Gas installation components.
- Preparation of proper operational framework and supportive legal regulations in order to ensure wider implementation of electrolyser-based plants in Poland.

3. Gas grid issues

3.1. Policy Summary at National level

Hydrogen is generated in Poland in large quantities as a byproduct of gas processing plants and hydrogen produced from steam reforming of methane. Currently there are no Power to Gas plants in Poland, due to lack of potential investors and proper legislation aspects.

In order to improve this issue, from this year (2018) hydrogen is considered as an alternative fuel for Poland (the Act of January 11, 2018 on electromobility and alternative fuels). The Act has transposed the European Directive AFID – Alternative Fuels Infrastructure Directive). In the third quarter of 2018, the National Framework for the Development of Alternative Fuels Infrastructure Policy will be introduced. This will include technical specifications for hydrogen refueling stations HRS, used devices and purity of gas. Based on this Act, hydrogen is recognized as a fuel gas, but there are no legal provisions yet, that allow its injection into the gas grid network and storage systems.

3.2. Overview and assessment of current legal framework

At present, there are no electrolysis-based installations on the industrial scale in Poland. Fortunately, based on the national Act of January 11, 2018 on electromobility and alternative fuels, hydrogen was finally described as fuel in Polish Law. Although hydrogen has started to be included on the national legislation level, there is still big lack of legislation aspects in the field of Power to Gas installations and injecting the generated hydrogen into the gas network and storage systems.

In Poland, the authority responsible for the whole gas grid operation is GAZ-System, while the legal and tariff aspects are determined and supervised by the national Energy Regulatory Office. The gas connections and injection permissions are given by the local distribution system operators (TSO), which are under GAZ-System.

Although, currently there are no regulations concerning injecting hydrogen into the gas grid, it can be assumed that in the near future, the restrictions and legal aspects should be similar to the biogas from the agriculture. These regulations on biogas are mainly focused on fulfilling the gas quality requirements, such as:

- gas composition,
- heating value,
- dew point,
- type and amount of impurities.

These regulations are described in two national legislation documents:

- ordinance by Ministry of Economy from July 2, 2010 concerning detailed conditions of gas system operation (national legislation) (<http://prawo.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20101330891>),
- ordinance by Ministry of Economy from August 24, 2010 concerning detailed quality analysis of biogas from agriculture, (national legislation) (<http://prawo.sejm.gov.pl/isap.nsf/DocDetails.xsp?id=WDU20111871117>).

For the international interconnection for the injection in the gas grid with neighboring countries, Poland has an agreement with Germany. This agreement does not allow to deliver hydrogen via gas grid to Poland. This is only allowed for the natural gas and biogas cases.

The main barrier concerning injection of hydrogen into the gas network is lack of proper legislation on several levels. Based on the changes in the Polish Law concerning the hydrogen topic, it can be stated that new legal regulations will be in power in the near future. It is assumed that these new regulations will be similar to the biogas restrictions.

3.3. Conclusions

Taking into account the permitting process (environmental, operational and building), Poland belongs to a group of countries where legal and administrative procedures are missing. There are no instructions defining in detail the process and recommendations that should be followed. Currently, Poland has only a set of standards that provide guidelines on the technical aspects related to the usage and safety of hydrogen as a fuel (energy carrier). Unfortunately, according to the current law, their use is voluntary.

3.4. Policy Recommendations

- Extension of Polish legal framework in terms of injection of hydrogen in to the gas network and storage system.
- Specification of safety and quality regulations for the hydrogen piping and storage.
- Adaptation of the existing gas network into the new standards including usage of hydrogen on the national level.



4. Hydrogen as a fuel and refueling infrastructure

4.1. Policy Summary at National level

The use of hydrogen as an energy carrier is beginning to emerge. In mobility sector the hydrogen is recognized as an alternative fuel at EU and national level in the last few years. The Fuel Cell Electric Vehicles (FCEVs) are still more expensive than conventional one, especially due to lack of economies of scale and the small number of circulating vehicles. The high vehicles purchase prices and the lacking hydrogen refueling infrastructure, which is also associated with high capital and operational costs, are the main economic barriers for the bright deployment of the FCEVs. Public and private fleet vehicles can play a significant role in the market introduction phase, increasing the share of FCEVs and creating the initial demand for hydrogen refueling stations.

Actually, hydrogen is considered as an alternative fuel for Poland (the Act of January 11, 2018 on electromobility and alternative fuels. The Act has transposed the European Directive AFID – Alternative Fuels Infrastructure Directive). In the third quarter of 2018 year it is planned to introduce to the National Framework for the Development of Alternative Fuels Infrastructure Policy (Krajowe Ramy Polityki Rozwoju Infrastruktury Paliw Alternatywnych), technical specifications for hydrogen refueling stations HRS, used devices and purity of gas. Despite the fact that the technical specifications for hydrogen which provide ISO standards can be applied without the need for implementation, it is advisable, for full transparency, to introduce changes to the national framework. Technical specifications are defined in the following standards:

- ISO/TS 20100 - hydrogen refueling in a gaseous state,
- ISO 17268 - devices used at HRS for the refueling hydrogen,
- ISO 14687-2 defines the quality of hydrogen fuel at HRS.

4.2. Overview and assessment of current legal framework

Currently, in Poland's legal framework there are no specific regulations concerning Hydrogen Refueling Stations (HRS) in residential areas. Lack of experience and clear regulations complicate interpretation of general rules. In current situation, the human factor has a significant impact on the procedure and final decision. Moreover, the whole procedure may be totally different in comparison to others locations, which is directly related to the local authorities' requirements and gained experience. Each case requires individual approach which increases the necessity of individual (case-by-case) modelling, calculation, planning, etc. As a result, efforts are duplicated without added benefits. Contrary, the procedure increases the regulatory risk for investor. Barriers and problems are most often the result of imprecise regulations or their lack in the scope of:

1. Land use plan, which concerns urban planning, adopted by the municipality. This document includes needs and demands in order to secure further development of the local community, business and industry. Local authorities use land-use planning to manage land development within their jurisdictions and to prevent conflicts of interest. The plan lays down rules universally applicable in a given area, which are the basis for issuing administrative decisions, including hydrogen technologies.
2. Zone prohibitions/permitting requirements – during this long-term and multi-stage process, it is being checked whether the planned investment complies with the applicable standards, legal requirements (eg minimum distance between a potential source of danger and an object, man, equipment or environment). Below list of required permits:
 - environmental (sewage disposal, waste generation or gas emissions to the atmosphere),
 - building,
 - operational (including safety regulations). The lack of experience in the field of hydrogen technologies, combined with the lack of clear regulations and instructions for local authorities, may generate delays, additional costs and lead to different interpretations.

It is difficult to find direct reference to hydrogen in legislation. However, it belongs to a group of flammable and explosive gases and must meet the requirements imposed on them, which are defined by a set of regulations, standards and a European agreement concerning the international transport of dangerous goods by road (ADR). The exception to the rule is the Act of January 11, 2018 on electromobility and alternative fuels. The Act has transposed the European

Directive AFID (Alternative Fuels Infrastructure Directive), which aims to minimize dependence on oil and mitigate the impact of transport on the environment. Alternative fuels are a substitute for fossil fuels used in transport. Such substitution can contribute to lowering emissions and improving the environmental impact of the transport sector. As a result of the transposition of the European AFID Directive, hydrogen is considered as an alternative fuel for Poland. The Act mentions also about HRS and plans for developing the refueling infrastructure (Chapter 3, Art 32, paragraph 6).

Low temperature fuel cells (PEMFC – proton exchange membrane fuel cell), which are widely used in road transport, required high purity of hydrogen in order to prevent poisoning the catalyst. Currently, there are two international standards for hydrogen quality control:

- ISO 14687-2: 2012 defines the quality of hydrogen fuel and distinguishes 13 levels of gaseous pollutants, in order to guarantee a homogeneous standard of gas dedicated to fuel cells with a proton exchange membrane (PEMFC).
- SAE J2719_201511 describes basic information and standard of hydrogen fuel quality for commercial fuel cells with proton exchange membrane (PEMFC).

The above standards define the highest standards of hydrogen purity, which raise the manufacturers' costs of production, due to the need to ensure high quality of gas. For this reason, ISO 14687-2: 2012 is considered too restrictive by the industry. It is currently being modified and is expected to be updated at the end of 2018. However, the following issues in the field of gas technical measurement will still not be resolved, which may constitute a barrier to the widespread use of hydrogen fuel in the transport sector:

- A few laboratories around the world are able to perform all measurements specified in ISO 14687.
- HRS have to be equipped with devices monitoring the level of contaminants/trace compounds in hydrogen.
- Lack of standards for hydrogen quality control procedures, sampling for representative sample analysis.

4.3. Conclusions

Taking into account the permitting process (environmental, operational and building), Poland belongs to a group of countries where legal and administrative procedures are missing. There are no instructions defining in detail the process and recommendations that should be followed. Currently, Poland has only a set of standards that provide guidelines on the technical aspects related to the usage and safety of hydrogen as a fuel (energy carrier). Unfortunately, according to the current law, their use is voluntary.

4.4. Policy Recommendations

- Ensure common, sensible approach for fuel quality measurement. A new standard for hydrogen quality measurements is under development: ISO/DIS 19880-8 Gaseous hydrogen – Fueling stations – Hydrogen quality control (National / Regional and Local authorities, Standardization bodies).
- Equal treatment of HRS as conventional refueling stations from the perspective of land use plans and zone prohibitions (National / Regional and Local authorities).
- Develop approval guidelines for Hydrogen Refueling Stations (National / Regional and Local authorities)
- Establish reasonable safety distances which enable the co-location of hydrogen refueling alongside conventional fuels (National / Regional and Local authorities, Standardization bodies (e.g. ISO TC 197 WG24)).

5. Production of hydrogen

5.1. Policy Summary at National level

The production of hydrogen from fossil resources, its transmission, distribution and use within the industry and refining sector are based on mature technologies and applied on a large scale. Therefore no legal and administrative barriers are arising in connection with production and conventional storage.

In case of local production outside the industry zone, for example in urban zone, appear problems and administrative barriers.

5.2. Overview and assessment of current legal framework

Poland is one of the biggest producers of hydrogen in the World. Most of the produced gas is derived from oil and natural gas. The production is realized mainly by three types of reforming process:

- methane steam reforming,
- partial oxidation,
- autothermal process (combination of two previous ones).

Unfortunately electrolysis had and still has a minimal impact on overall production volume. The potential of this method is not fully exploited. Legislation that concerns industrial production is strictly interpreted and applied to local production (e.g. using the electrolysis process) as well. Such approach significantly reduces the number of local initiatives that could promote hydrogen technologies (e.g. fuel cells) and local hydrogen infrastructures (e.g. Hydrogen Refueling Stations HRS). Thus, the inability to distinguish between local and industrial methods of hydrogen production limits the potential of these technologies for the needs of local production outside industrial zone, for example in the residential and service zones. Barriers and problems are most often the result of imprecise regulations or their lack in the scope of:

3. Land use plan, which concerns urban planning, adopted by the municipality. This document includes needs and demands in order to secure further development of the local community, business and industry. Local authorities use land-use planning to manage land development within their jurisdictions and to prevent conflicts of interest. The plan lays down rules universally applicable in a given area, which are the basis for issuing administrative decisions, including hydrogen technologies.
4. Zone prohibitions/permitting requirements – during this long-term and multi-stage process, it is being checked whether the planned investment complies with the applicable standards, legal requirements (e.g. minimum distance between a potential source of danger and an object, man, equipment or environment). Below list of required permits:
 - environmental (sewage disposal, waste generation or gas emissions to the atmosphere),
 - building,
 - operational (including safety regulations). The lack of experience in the field of hydrogen technologies, combined with the lack of clear regulations and instructions for local authorities, may generate delays, additional costs and lead to different interpretations.

5.3. Conclusions

Taking into account the permitting process (environmental, operational and building), Poland belongs to a group of countries where legal and administrative procedures are missing. There are no instructions defining in detail the process and recommendations that should be followed. Currently, Poland has only a set of standards that provide guidelines on the technical aspects related to the usage and safety of hydrogen as a fuel (energy carrier). Unfortunately, according to the current law, their use is voluntary.

5.4. Policy Recommendations

- Develop guidelines for specific requirements for each type of zone prohibitions for hydrogen production units.
- Differentiate hydrogen production units from Steam Methane Reforming which are more standard, from electrolysis production units.



HyLAW

- Promote simplified process for demo units to foster the deployment of H₂ production units. (national/local authorities with the support of gas producers, electrolysers manufacturers, pre-normative or normative organisations)



6. Stationary Power, Fuel cells, and other issues

6.1. Policy Summary at National level

Fuel cells are a promising technology that might be a very clean and efficient solution for the heat and power generation purposes. Although from this year (2018) hydrogen is considered as an alternative fuel for Poland (the Act of January 11, 2018 on electromobility and alternative fuels), the fuel cells itself are not used on the larger scale, especially in micro-cogenerative systems. Currently in Poland there are several micro-CHP system based on solid oxide fuel cells, including one built by the Institute of Power Engineering. All of them are demonstrative units.

Unfortunately, highly efficient and clean micro-cogenerative units are not very popular in Poland, due to the lack of proper legal regulations and support system. In 2015 the situation has slightly changed, due to new national Act from February 20, 2015 concerning the renewable energy sources. With this legislation, owners of the micro-installations are able to sell the generated electricity to the grid, but with strict restrictions. This might be a good step in promoting such solutions, but in overall, micro-cogenerative units, including ones with fuel cells, are not profitable. This is a financial and economical barrier for the potential investors.

6.2. Overview and assessment of current legal framework

At present, there are no fuel cell-based micro-cogenerative units in Poland on the commercial/industrial scale. It is being distinguished only two commercial prototypes purchased for demonstration purposes and training and one prototype, developed and assembled at the Institute of Power Engineering. Micro-CHP installation with solid oxide fuel cells has 2 kW_e power output and electrical efficiency of 45%. This is only a prototype, due to the lack of external support for the commercialization of this technology. Fortunately, based on the national Act of January 11, 2018 on electromobility and alternative fuels, hydrogen was finally described as fuel in Polish Law. Although hydrogen has started to be included on the national legislation level, there is still big lack of legal regulations and support systems concerning the micro-CHP technologies, also including fuel cells.

The situation has changed for the better in recent years, because of the national Act from February 20, 2015 concerning the renewable energy sources. Thanks to this legislation, the prosumers are allowed to sell the electric power generated in the micro-cogenerative unit, into the e-grid, but with specific restrictions and regulations. First of all, the price for the selling electric power cannot be higher than 80% of the market price from the previous year. This value is announced by the Energy Regulatory Office. For example, in 2014 the market price was 181,55 PLN/MWh, thus the resale price from the micro-cogenerative unit was 145,24 PLN/MWh. Additionally, in order to be able to sell the electricity to the electric grid, the prosumer has to acquire the proper certificate that proves the energy source, i.e. type of the fuel. Although, legal permission to sell electric power is the advantage for the micro-CHP systems, this technology still lacks proper support systems in order to be a profitable option. This includes especially fuel cell-based units, thus a financial and economical barrier is present.

For the connection of the potential micro-cogenerative systems to the both gas and electric networks, the permissions are given by the local gas and power distribution operators. There is no specific legal regulations concerning how fuel cell-based systems should be connected to the national gas and electric systems, thus for now it can be assumed, that the restrictions and formal requirements should be the same, like for other industrial installations.

6.3. Conclusions

Taking into account the permitting process (environmental, operational and building), Poland belongs to a group of countries where legal and administrative procedures are missing. There are no instructions defining in detail the process and recommendations that should be followed. Currently, Poland has only a set of standards that provide guidelines on the technical aspects related to the usage and safety of hydrogen as a fuel (energy carrier). Unfortunately, according to the current law, their use is voluntary.

6.4. Policy Recommendations

- Determination of administrative procedures for connecting high-efficiency micro-CHP systems to the electricity grids
- Creation of an integrated policy and legal approach, recognizing the energy efficiency and the smart grid functionality of the residential stationary fuel cells and promoting them as high-efficiency micro-cogenerations.
- Implementation of the national support systems for the fuel cell-based micro-cogenerative systems, making them more profitable, thus reducing the financial barrier.

7. Stationary storage: gas/liquid/metal hydride

7.1. Policy Summary at National level

The storage of hydrogen its transmission, distribution and use within the industry and refining sector are based on mature technologies and applied on a large scale. Therefore no legal and administrative barriers are arising in connection with conventional storage. This application deals with the storage of hydrogen in conventional gas tank, metallic cylinders and composite vessels. Tanks in vehicles are not covered by this application

In case of local and temporary storage outside the industry zone, for example in urban zone, appear problems and administrative barriers.

For this category, the umbrella legislation is mentioned to be the EU SEVESO and/or ATEX directive plus pressure equipment permit, (installation), which includes fire protection authority's permit or approval with safety distances.

7.2. Overview and assessment of current legal framework

Hydrogen is a flammable, explosive gas, hence restrictions and prohibitions are, to a certain extent, necessary. Actually storage of hydrogen is limited to industrial zones.

However, with the increase use of hydrogen in various commercial applications (e.g. as a fuel, sold in hydrogen refueling stations or consumed by micro-CHP's), the storage of hydrogen should be possible in all areas where the local consuming can be located. For example, any location where a hydrogen/conventional fueling station is allowed. It is necessary to distinguish "commercial", local use of hydrogen form industrial use and separate legislation together with administrative practice a realistic opportunity to differentiate them.

Barriers and problems are most often the result of imprecise regulations or their lack in the scope of:

5. Land use plan, which concerns urban planning, adopted by the municipality. This document includes needs and demands in order to secure further development of the local community, business and industry. Local authorities use land-use planning to manage land development within their jurisdictions and to prevent conflicts of interest. The plan lays down rules universally applicable in a given area, which are the basis for issuing administrative decisions, including hydrogen technologies.
6. Zone prohibitions/permitting requirements – during this long-term and multi-stage process, it is being checked whether the planned investment complies with the applicable standards, legal requirements (eg minimum distance between a potential source of danger and an object, man, equipment or environment). Below list of required permits:
 - environmental (sewage disposal, waste generation or gas emissions to the atmosphere, SEA and EIA Directives),
 - building,
 - operational (Risk Assessments – SEVESO Directive, Health and Safety Requirements – ATEX Directive).

To sum up, there is no explicit prohibition for hydrogen facilities. However, lack of regulations concerning safe distance, maximal quantity in case of local storage for commercial purpose is a big barrier for popularization and development of hydrogen technologies.

7.3. Conclusions

Taking into account the permitting process (environmental, operational and building), Poland belongs to a group of countries where legal and administrative procedures are missing. There are no instructions defining in detail the process and recommendations that should be followed. Currently, Poland has only a set of standards that provide guidelines on the technical aspects related to the usage and safety of hydrogen as a fuel (energy carrier). Unfortunately, according to the current law, their use is voluntary.

7.4. Policy Recommendations

- Develop guidelines for specific requirements and zone prohibitions for installations with hydrogen storages.
- Shorten the duration to receive the permits, and if a maximum response time is set, take measures to meet this target.
- Incorporate H₂-specific (H₂ storage-specific) rules into the existing, relevant legislation like national Seveso legislation; government level land use plan zone definitions.
- Adapt national and local regulation and administrative practice to ensure that the storage of hydrogen, in the quantities in which it is required should be allowed in the same zones where the application consuming the hydrogen is or can be located
- (national/local authorities with the support of pre-normative or normative organisations)



