HyLaw - EU-level activities, conclusions and European Framework.

Nicolas Brahy

November 2018

HyLaw National Workshop – Paris, France

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Grant Agreement No 737977

Legal & administrative processes hamper the uptake of FCH technologies

Today: Increasing deployment and appetite for fuel cells and hydrogen (FCH) technologies across Europe: more products better performance, reduced cost.

BUT :

- Existing regulatory legal framework e.g. planning, safety, installation, operation – often only reflect conventional technology and is therefore insufficient
- Non adapted measures - additional costs and time, resource intensive… For ex. lengthy and costly permitting requirements to install a hydrogen refuelling station in most European countries

This represents a barrier to scale up fuel cell and hydrogen deployment

HyLaw Objectives

Policy	Market
Identify regulatory barriers (and best practices) and advocate for better regulation to support the uptake of fuel cell and hydrogen technologies	**Describe legal and administrative processes** which apply when deploying key Hydrogen technologies (coherent, user friendly, online database)

Analytical documents
Policy Papers (Recommendations)

User friendly database

Scope

- 55 Legal and administrative processes
- 20 hydrogen applications
- 8 categories

Categories of applications
1. Production of hydrogen
2. Storage of hydrogen
3. Transport and distribution of hydrogen
4. Hydrogen as a fuel and refueling infrastructure for mobility purposes
5. Vehicles
6. Electricity grid issues
7. Gas grid issues
8. Stationary power; fuel cells (other issues than gas grid and electricity)

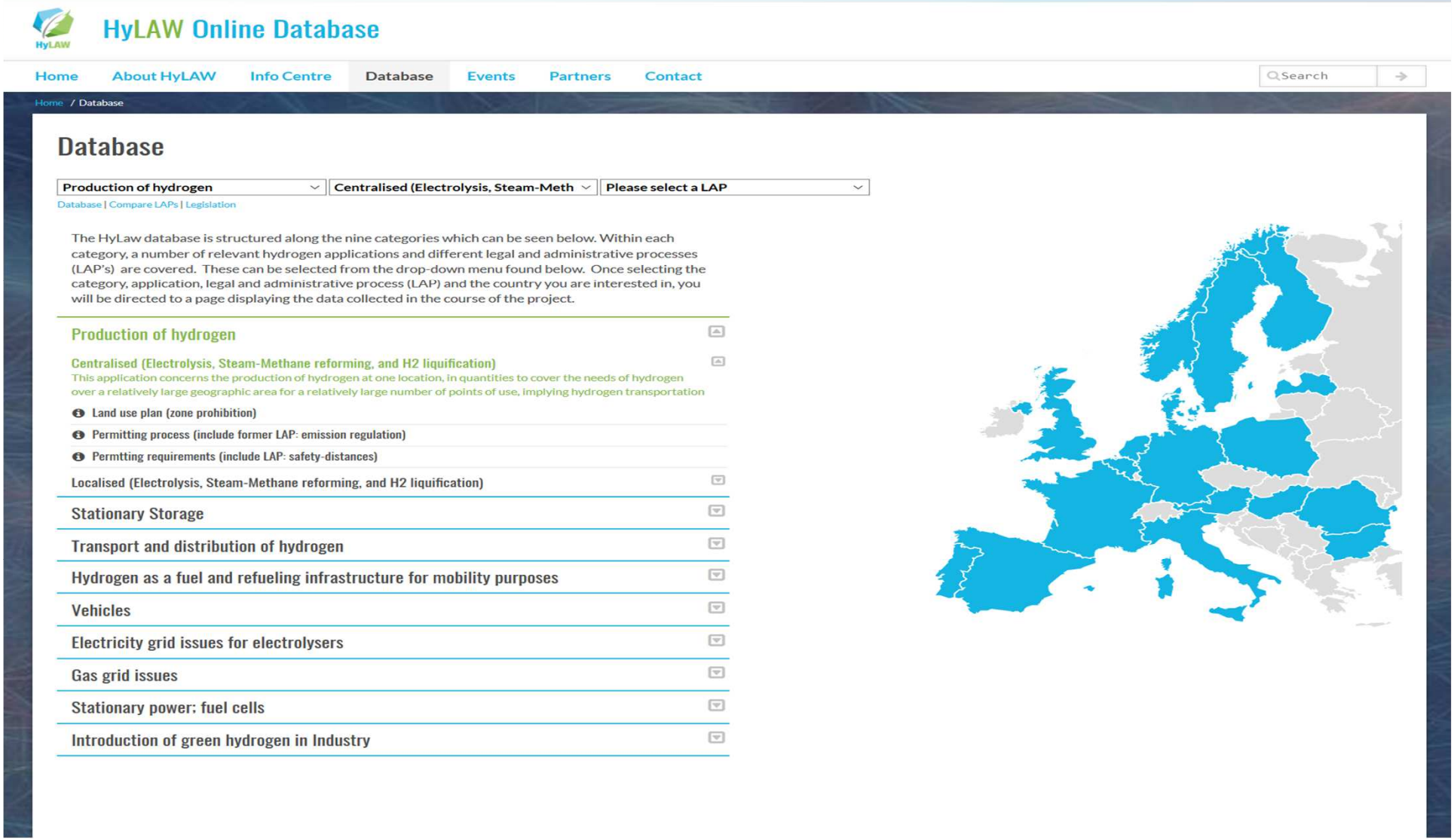
Geographical coverage

- HyLaw's covered 17 EU Countries + Norway.

- 23 Partners contributed to the work, providing details on the legal and administrative processes applicable in their countries

HyLaw – Online Database preview

- Database is online on www.hylaw.eu/database



HyLaw – Online Database preview

HyLAW Online Database

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Home / Database / Production of hydrogen / Centralised (Electrolysis, Steam-Methane reforming, and H2 liquification) / Land use plan (zone prohibition)

Land use plan (zone prohibition)

Production of hydrogen | Centralised (Electrolysis, Steam-Meth | Land use plan (zone prohibition)

Database | Compare LAPs | Legislation

Land use plan (zone prohibition)

This LAP refers to the land use plan and analyses the legal requirements for building a centralised 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.

Germany

Expand all answers

a - What are the main regulations/requirements regarding land use plans for building a hydrogen production facility (e.g. permitting regime, agreement)?

b - Are there specific requirements or zone prohibitions for building a hydrogen production facility in the land use plans?

Which is the authority responsible for delivering the land use permit ?

The preparatory and legally binding land use plans are developed and adopted by the municipalities in the framework of national legislation.)

Is there a uniform permit process at local level throughout a country? (uniform interpretation?)

If needed, what is required and how much time does it take to change the land use plan?

Is it a barrier?	No
Assessment Severity	0
Assessment	The LAP is important for identifying the types of land use plans and their requirements resp. prohibitions for building of an industrial hydrogen production plant.

Show National legislation

Show EU legislation

Show Glossary

Show Pan-European Assessment

View Legislation Table

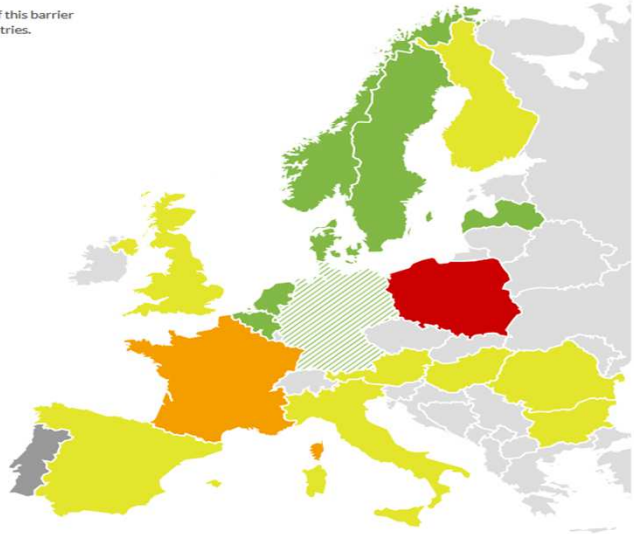
PDF Export | Excel Export

The information is correct | There are errors ...

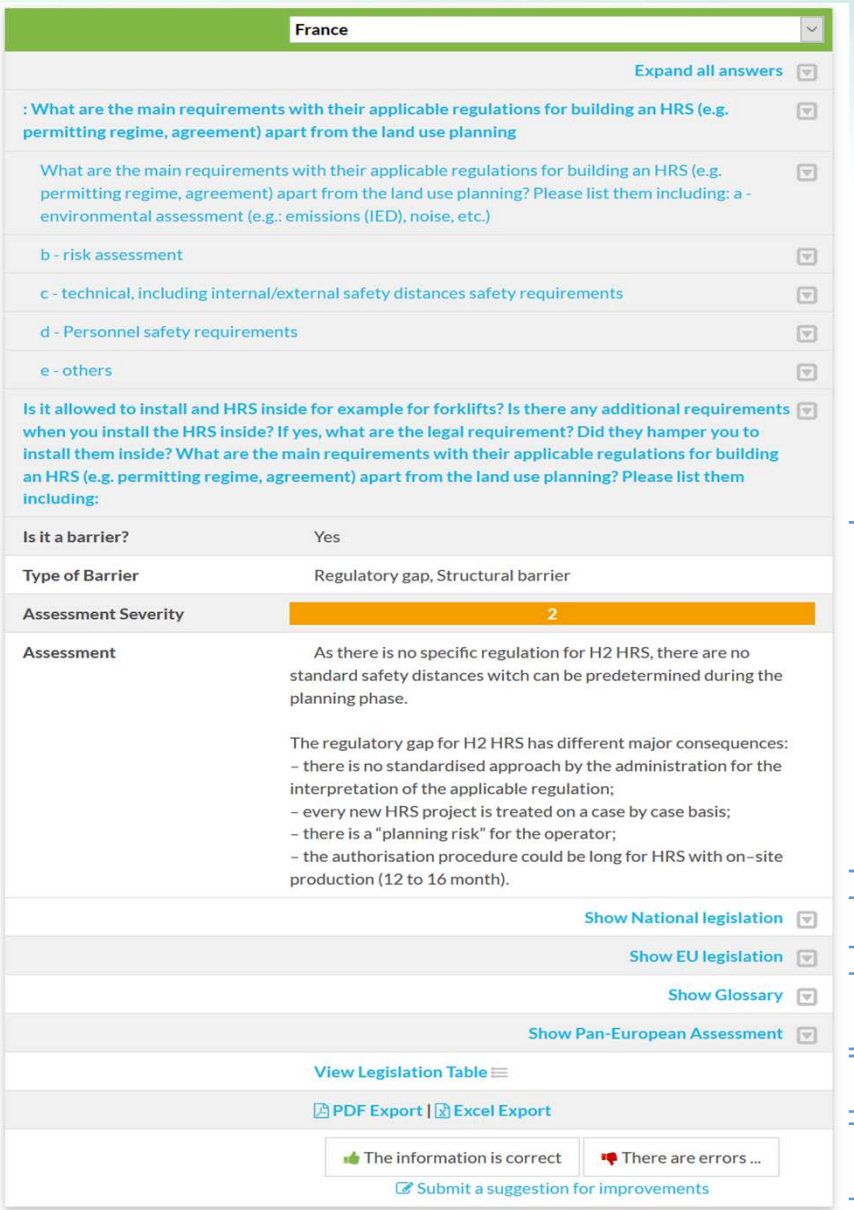
Submit a suggestion for improvements

This map depicts the severity of this barrier across the HyLaw Partner countries.

- No barrier
- Low
- Medium
- High
- Data not available
- Selected countries



HyLaw – Online Database preview



Questions and Answers:

- A starting point to understand the process and requirements
- Future work (possible follow-up) could go deeper or answer additional questions

Assessment:

- Project partners *tried* to assess whether the process represents a barrier for industry
- Somewhat subjective, but reasoning is explained for each country and on pan-European level (see below)

Applicable Legislation (National and EU, incl. standards) as well as links to the legal acts where available

Glossary (to explain terms used) and **Pan European Assessment** (to explain the severity of assessment)

Export and other display functionalities

Stakeholder feedback (multiple functionalities, including editing)

HyLAW: Analytical Reports

- D4.1: Detailed **cross-country analysis:** For each process
    - Presentation of the problem
    - Assessment of root causes
    - Recommendations
- D 4.2: **List of legal barriers**, prioritized by degree of severity (Estimated November)
- D 4.4. **List of the most relevant EU legislation**

www.hylaw.eu/info-centre

HyLAW: Policy Papers

- **Policy papers:** Key messages and recommendations
  - National Policy Papers for each country
  - Horizontal (for each application) policy papers (estimated November)
  - EU Policy paper (Estimated November)

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The HyLaw consortium has analysed the applicable legal and administrative processes in all the countries covered and has produced a set of analytical reports which seek to shed more light on the sources of regulatory barriers and the impact they have on the timely delivery of hydrogen technologies. We are happy to make them publicly available below:

National policy papers

Building on the content of the database, National policy present the state of play of the Hydrogen Regulatory environment in each country and detail country specific recommendations.

Austria	Germany	Poland
Belgium	Hungary (HU)	Portugal
Bulgaria	Italy	Romania
Denmark (EN) (DK)	Latvia	Spain (EN) (ES)
Finland	Netherlands	Sweden
France	Norway	United Kingdom

EU policy paper

Analytical reports and other deliverables

D4.1 - Cross-country analysis -

- For each category
  - each application
    - each legal and administrative process

- The report
  1. Assesses the situation and whether there is a barrier

  2. Identifies the nature of the barriers and the impact of the barriers
     - Structural barrier
     - Operational barrier
     - Economic barrier
     - Regulatory gap
  3. Compares systematically European countries identifying good .. and less good practices
  4. Identifies sources of the sources of the problem
     - EU regulation/directive
     - National rules/ national transposition of EU directive
     - Implementation by local authorities
  5. Makes recommendations

D4.1 - Cross-country analysis - examples

1. **Assesses the situation and whether there is a barrier**
2. **Identifies nature of the barriers and impact**

Example HRS safety distances HRS

Problem:

- Currently, there is no clear set of safety requirements, (including distances, permits, assessments) defined specifically for Hydrogen Refueling stations in most European countries.
- In practice, case-by-case risk assessments and (very) cautious estimations by local authorities. In this sense, a regulatory gap and, to a certain extent, a structural barrier can be observed.

Impact:

The regulatory gap for safety requirements specific to HRS has several major consequences:

- HRS operators face uncertainty
- Unreasonably high requirements
- Duplication of efforts
- Disincentive HRS with on-site production

- The administrative practice and existing rules in some countries (e.g. France, Finland, Latvia, Romania) impose **very high safety distances** for Hydrogen Storage, this is **seen as a structural barrier**, as imposing unreasonable safety distances prevents the adaptation of conventional refuelling stations to include hydrogen refuelling within existing locations, therefore **resulting in a major barrier for the accelerated uptake of hydrogen mobility**.

D4.1 - Cross-country analysis - examples

3. Compare systematically European countries identifying good .. and less good practices

Example: permitting process for HRS

When considering the process of permitting the construction and operation of a HRS, there are very few countries where the regulations are specifically designed to regulate HRSs, the most advanced being Germany, Denmark, the UK and the Netherlands. Specific Regulations (AMPG) in France are also under development

Where explicit requirements exist, they invariably require a risk assessment to be carried out covering safety risks associated with fire and explosion, health risks and environmental risks. The risk assessments should also identify the control measures to be put in place to provide an adequate level of public safety for the proposed installations. The risk assessment should include an assessment of major accident hazards presented by the delivery, storage and dispensing of hydrogen at the site and identify controls and contingency plans.

Where specific regulations for hydrogen fuelling stations don't exist, it is expected that authorities will draw on both the permitting process of conventional refuelling stations as well as the regulations applicable for (industrial) H2 storage and for H2 production. This method of working generates requirements well beyond those applicable to conventional stations and the permitting process carries some "regulatory risks" for the operator, as the interpretation and demands from the regional administrative authority can be different from one region to another. By contrast, the requirements for conventional fuel storage at refuelling station are very similar in all EU countries. The lack of experience for potential HRS operators as well as public authorities coupled with the lack of guidelines and instructions for local authorities can cause delays and extra costs and may lead to divergent interpretations from case-to-case, further complicating the obligations of HRS operators.

D4.1 - Cross-country analysis - examples

3. Identifies good practices and even sources of inspiration

Example for HRS permitting process

- Specific rules for HRS (DE, UK, NL, DK, …. And soon FR?)
- Step by step guidelines in Germany (and later UK and NL)

Example for safety distance for HRS and mutlifuel stations

- UK blue book on multifuel stations.
- Standard distances for CNG/LPG stations

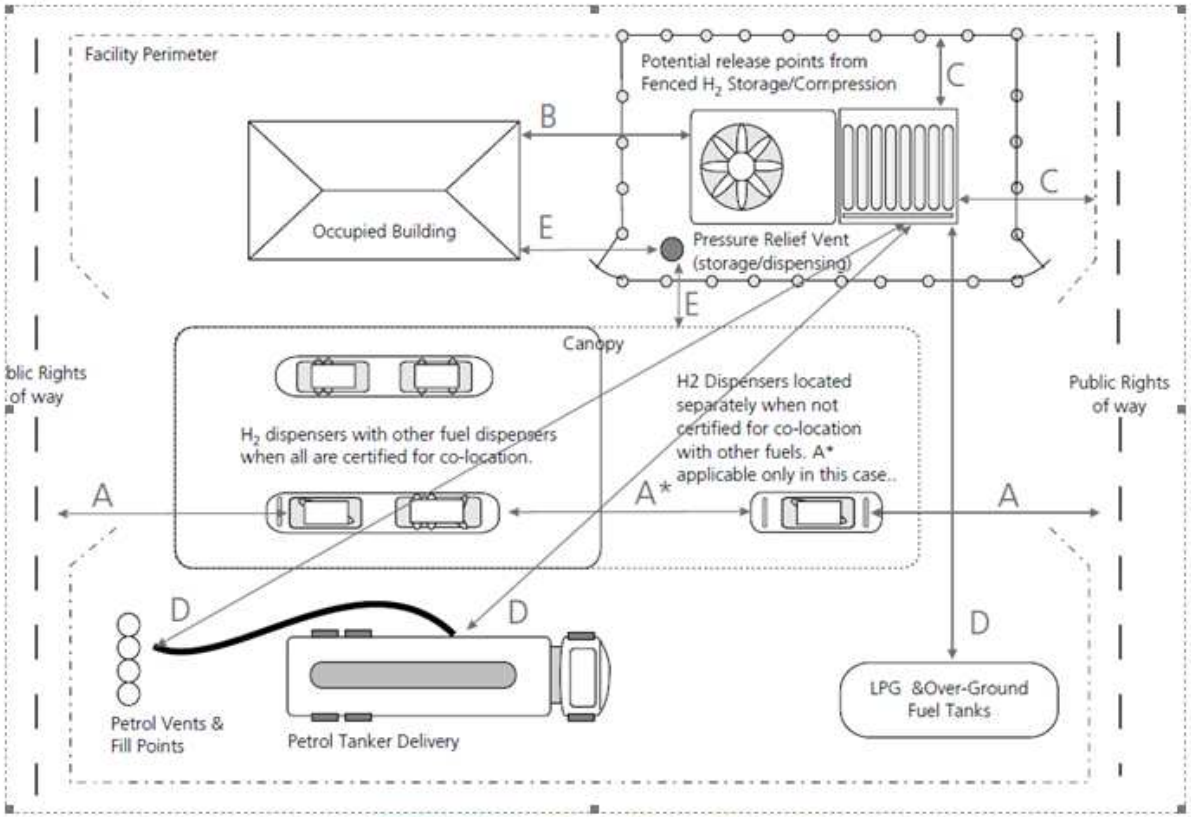
D4.1 - Cross-country analysis - examples

3. Identifies good practices and even sources of inspiration

Example for safety distance for HRS including mutlifuel stations

- UK blue book on multifuel stations.

Figure 1, Example hydrogen and other fuels separation distances (Source: UK Guidance on hydrogen delivery stations for refuelling of motor vehicles, co-located with petrol fuelling stations (APEA, BC GA, EI guidance))[76]



D4.1 - Cross-country analysis - examples

3. Compare systematically European countries identifying good .. and less good practices

Example of incentives on vehicles

Table 9: Comparative list of incentives on hydrogen cars / buses in the partner countries

	Access to specific lanes	Free/ reduced fee parking	Tax incentives	Registration fee reduction	Toll charges exemption	Public proc. Rules	Others
Austria	✗	✗	✓	✗	✗	✗	✗
Belgium	✗	✗	✓	✓	✓	✗	✓
Bulgaria	✓	✓	✓	✓	✗	✓	✗ (✓)
Denmark	✗	✓	✓	✓	✗	✓	✗
Finland	✗	✓	✗ (✓)	✗	✗	✗	✗
France	✓	✓	✓	✓	✓	✓	✗
Germany	✓	✓	✓	✗	✗	✓	✓
Hungary	✗	✗	✗	✗	✗	✗	✗
Italy	✗	✗	✗	✗	✗	✗	✗
Latvia	✓	✓	✓	✓	✗	✗	✗
Netherlands	✗	✗	✓	✗	✗	✗	✗
Norway	✓	✓	✓	✓	✓	✗ (✓)	✓
Poland	✗	✗	✗	✗	✗	✗	✗
Portugal	✗	✓	✓	✗	✗	✗	✗
Romania	✗	✗	✗	✗	✗	✓	✗ (✓)
Spain	✓	✗ (✓)	✓	✓	✓	✗	✓
Sweden	✗	✗	✓	✗	✗	✗	✓
UK	✗ (✓)	✗ (✓)	?	✓	✓	✓	✓

4. Identifies sources of the sources of the problem

- **EU regulation/directive**
- National rules/ national transposition of EU directive
- Implementation by local authorities

Example HRS permitting requirements

Although it may not be evident, given that permitting is under the competence of local or regional authorities, based on national legislation, the **permitting requirements applicable to HRSs draw heavily on obligations established at EU level**. In this sense, the relevant Directives which affect the permitting requirements for HRSs are the SEA[68] and EIA Directives, (including Directive 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment[69] as well as Directive 2012/18/EU (SEVESO Directive)[70], Directive 2010/75/EU on industrial emissions[71] and the ATEX Directive (Directive 2014/34/EU)[72]. These Directives have been designed to regulate large scale, chemical, emission emitting industrial processes but end up applying also to small scale, non-emitting processes.

As also discussed in section 4.4.1, the scope of these Directives includes the production of hydrogen, irrespective of the production method. As a result, the production of hydrogen via electrolysis (which, depending on the methods of production of electricity, causes no direct emissions) is subject to the same requirements as industrial processes which have a strong environmental footprint. Furthermore, the threshold for production (i.e. *industrial scale* according to the IED) is unclear and places high burdens on low volume production sites (e.g. an HRS with on-site production. Finally, although the threshold for application of lower tier requirements of the SEVESO Directive (over 5 tons) appears to be rather clear, Member States appear to have "gold-plated" transposition acts by establishing requirements for storage sites below 5 tons.

As an unintended effect, the obligations prescribed in these Directives (i) severely inhibit the deployment of HRSs with on-site production (despite their potential to reduce overall carbon emissions and low environmental risk) and (ii) increase the overall costs and time required for development of HRSs (with or without on-site production) through the imposition of complex obligations even when hydrogen is stored (and produced) in small quantities.

4. Identifies sources of the sources of the problem

- EU regulation/directive
- National rules/ national transposition of EU directive
- Implementation by local authorities

Example HRS permitting requirements

Risk assessments for HRS are required in all partner countries, in accordance with general industrial health and safety regulations applicable in each country. The origin of this obligation stems for EU legislation, however the process and requirements differ to quite a large extent. In most countries, the HRS owner would be responsible to conduct such an assessment, however, in Belgium, the risk assessment must have been done by an accredited external expert

In all partner countries an environmental assessment is required for HRS permitting, although in some countries , the scope of such an assessment would depend on a) the amount of drogen stored on site and b) on whether hydrogen production takes place on site or not.

In at least five countries (Hungary, Belgium, Germany, Latvia, UK), an environmental Impact Assessment would not typically be required in case of a (small) HRS, due to the relatively high threshold for hydrogen storage (10.000 m3 storage capacity in Hungary, over 30 tons in Belgium; over 3 tones in Germany; 600 kg in Latvia).

5. Makes recommendation

Example: land use rules for HRS

- issue:
  - Different zones for different activities
  - No explicit qualification of H2 local production
  - Authorities search for a qualification
    - In EU texts (IED, EIA, SEA, …)
    - In classification of activities (NACE code or Nomenclature des Activités Économiques dans la Communauté Européenne)
      - code: *20.11 - Manufacture of industrial gases*
      - *Or Code 20.13 - Manufacture of other inorganic basic chemicals*
- Problem
  - H2 local production ends up being treated as industrial activitity and HRS are limited to industrial zone.
- Recommendations:
  - In land use: treat HRS explicitly as conventional fuel stations
  - In NACE code treat HRS as conventional fuel stations
    - *Code 47.30 - Retail sale of automotive fuel.*

HyLaw Workshops: Disseminating results and recommendations

- All planned events: www.HyLaw.eu/events
- Contact organizer if interested in participating, you are welcome!

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EU Workshop

A HyLaw EU workshop is scheduled to take place in Brussels on the **6th of December 2018** – for details, contact Alexandru Floristean: a.floristean@hydrogeneurope.eu.

Country	City	Location	Date	Contact Person	Contact Email
EU	Brussels	Hydrogen Europe, Avenue de la Toison d' Or 56- 60	06/12/2018	Alexandru Floristean	a.floristean@hydrogeneurope.eu

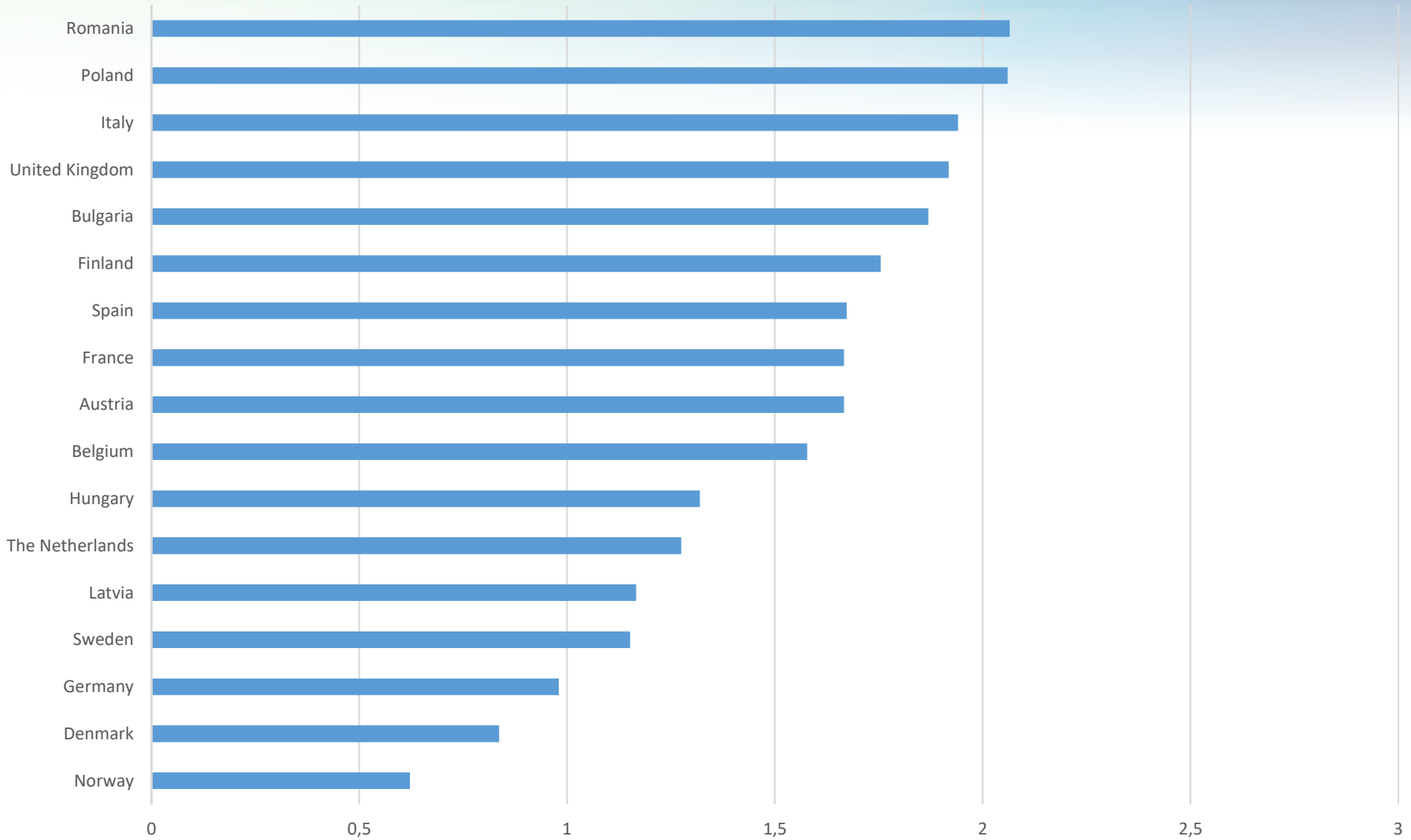
National Workshops

A key national workshop will be organised in each country to present the results of the HyLaw project . Please check below for a schedule of events.

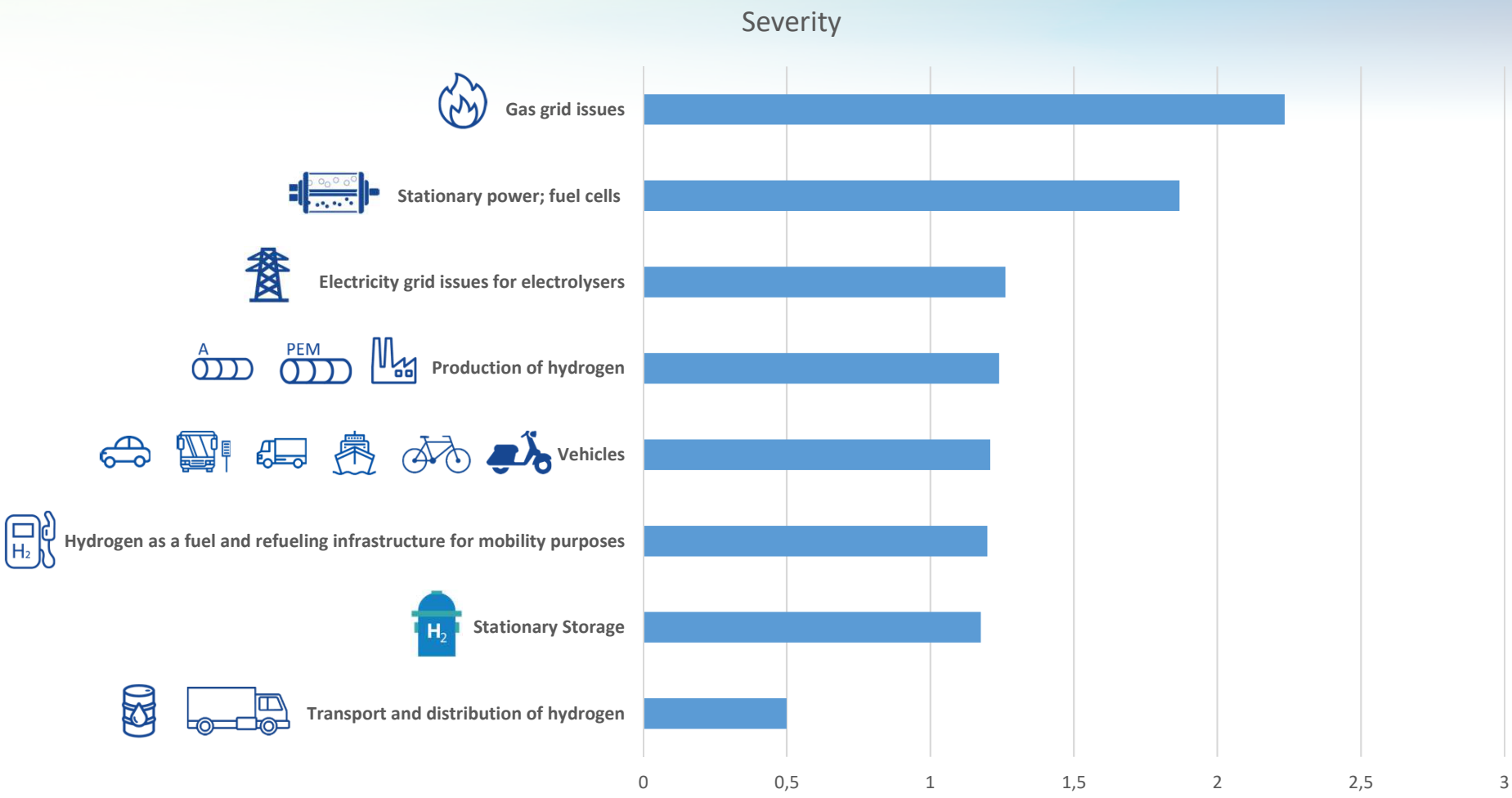
Country	City	Location	Date	Contact Person	Contact Email
AT	Vienna	AEA Executive Committee	06/11/2018	Alfred Schuch	Alfred.Schuch@energyagency.at
BE	Brussels	Avenue de la Toison d' Or 56- 60	23/10/2018	Isabel Francois	isabel.francois@waterstofnet.eu
BG	Sofia	Sofia	06/11/2018	Daria Vladikova	d.vladikova@bas.bg
DK	Copenhagen	Danish Energy Association	25/09/2018	Chris Holst Preuss	TLJ@brintbranchen.dk
FI	Espoo	Dedicated Hydrogen Seminar	07/11/2018	Mikko Kotisaari	mikko.kotisaari@vtt.fi
FR	Paris	To be announced	06/11/2018	Christelle Werquin	Christelle.werquin@afhypac.org
DE	Berlin	Dedicated Workshop	08/11/2018	Dennitsa Nozharova	dennitsa.nozharova@encon-europe.de
HU	Budapest	MTA TTK building, XI.district Budapest, Magyar Tudósok krt. 2.	27/09/2018	Mayer Zoltan	mayer.zoltan@hfc-hungary.org
IT	Milan	National Forum on FC&H technologies, 2018	25/10/2018	Viviana Cigolotti	viviana.cigolotti@enea.it
LV	Riga	The Environment and Energy trade fair	19-21/10/2018	Dainis Boss	dainis@h2lv.eu
NL	The Hague	Dedicated HyLaw Workshop	09/11/2018	Remco Perotti	remco.perotti@nen.nl
NO	Oslo	Citybox, Prinsens gate 6	11/10/2018	Heidi Bull-Berg	Heidi.bull-berg@sintef.no
PL	Warshaw	HyLaw National Workshop	21/11/2018	Marcin Blesznowski	marcin.blesznowski@ien.com.pl
RO	Băile Govora, Vâlcea	Energy Storage Symposium	24-26/10/2018	Ioan Iordache	office@h2romania.ro
ES	Madrid	CDTI (Centro para el Desarrollo Tecnológico Industrial)	18/09/2018	Miguel Zarzuela	mzarzuela@hidrogenoaragon.org
SE	Stockholm	Tändstickspalatset, Västra Trädgårdsgatan 15, Stockholm	20/11/2018	Bjorn Aronsson	bjorn.aronsson@vatgas.se
UK	London	London City Hall	08/11/2018	Emma Fenton	Emma.Fenton@london.gov.uk

- ADDITIONAL SLIDES

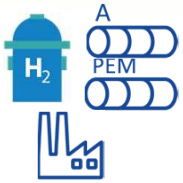
Overall assessment across countries



Severity of barriers in each category



HyLaw: Horizontal Findings – an overview



Directives designed to regulate large scale emitting chemical processes end up applying also to small scale, non-emitting processes / national permitting processes

Standards for compressed hydrogen receptacles (e.g. trailers) would need to be adapted to world with a higher demand for Hydrogen

- A guarantee of origin system for green and low carbon hydrogen at European level is essential;
- Infrastructure development encouraged at EU level / Common standards and definitions;
- Consumption of hydrogen (as a fuel) encouraged at EU level

Type approval and registration of hydrogen road vehicles appears to be quite clear and well regulated

However, maritime applications faces significant regulatory barriers

HyLaw: General Findings

There is no clear and unequivocal legal position for P2G facilities recognized across both e-grid and gas grid networks

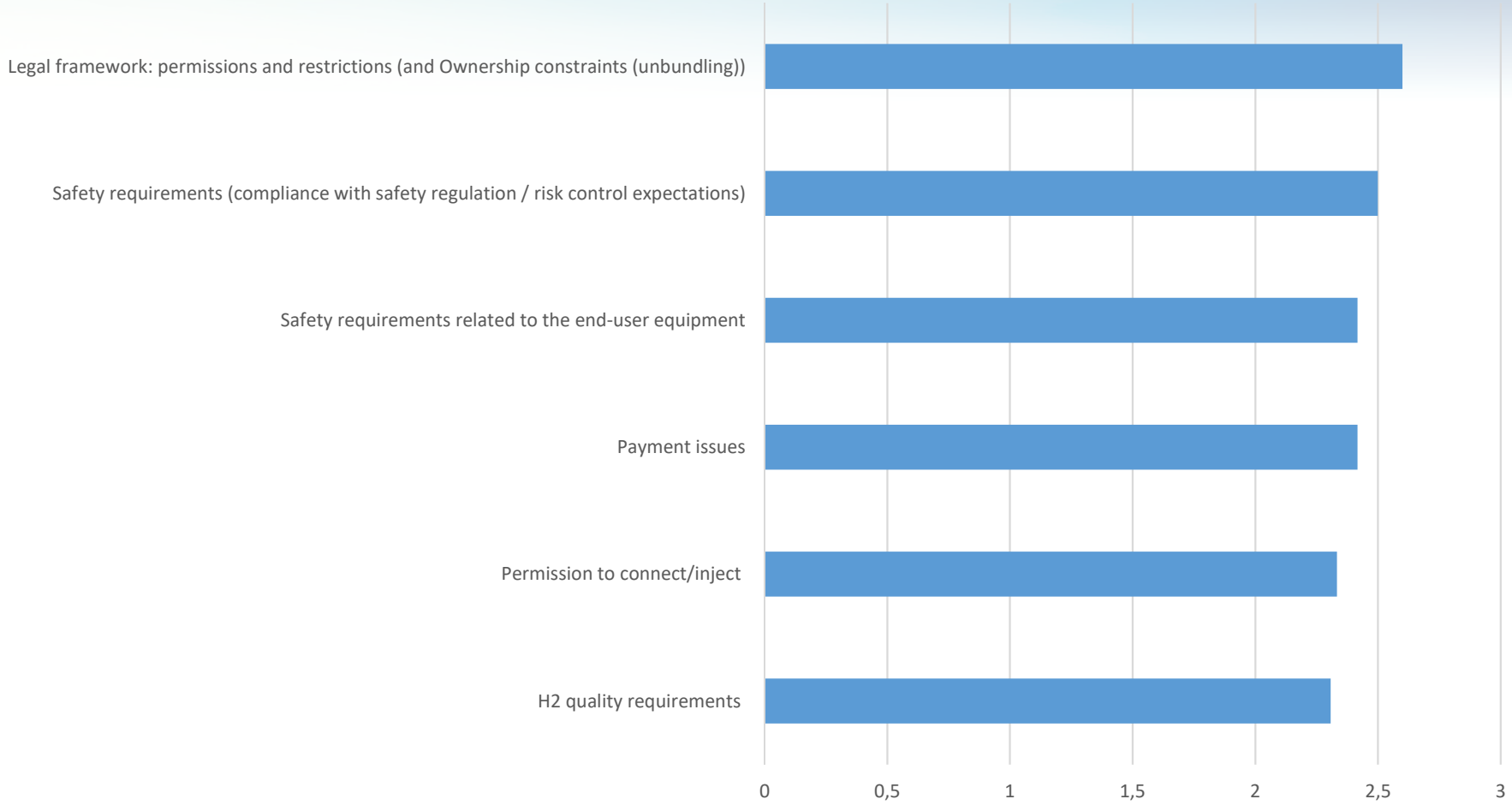
There are fundamental barriers severely constrain or prevent H2 injection in EU Gas Grids

The framework for permitting Power to Gas (P2G) plant and grid connection / injection requirements between the hydrogen supplier and the gas grid operators **should be included within relevant EU regulatory frameworks** to ensure comparable treatment across the EU.

There is no common EU framework for installation of FC micro-CHP units, however, no significant operational barriers were identified

Large Scale (industrial) stationary power fuel cells not covered by HyLaw, however, would the EU ETS apply to Solid Oxide Fuel Cells producing over 20 MW of power?

Gas Grid Issues
Severity of barriers



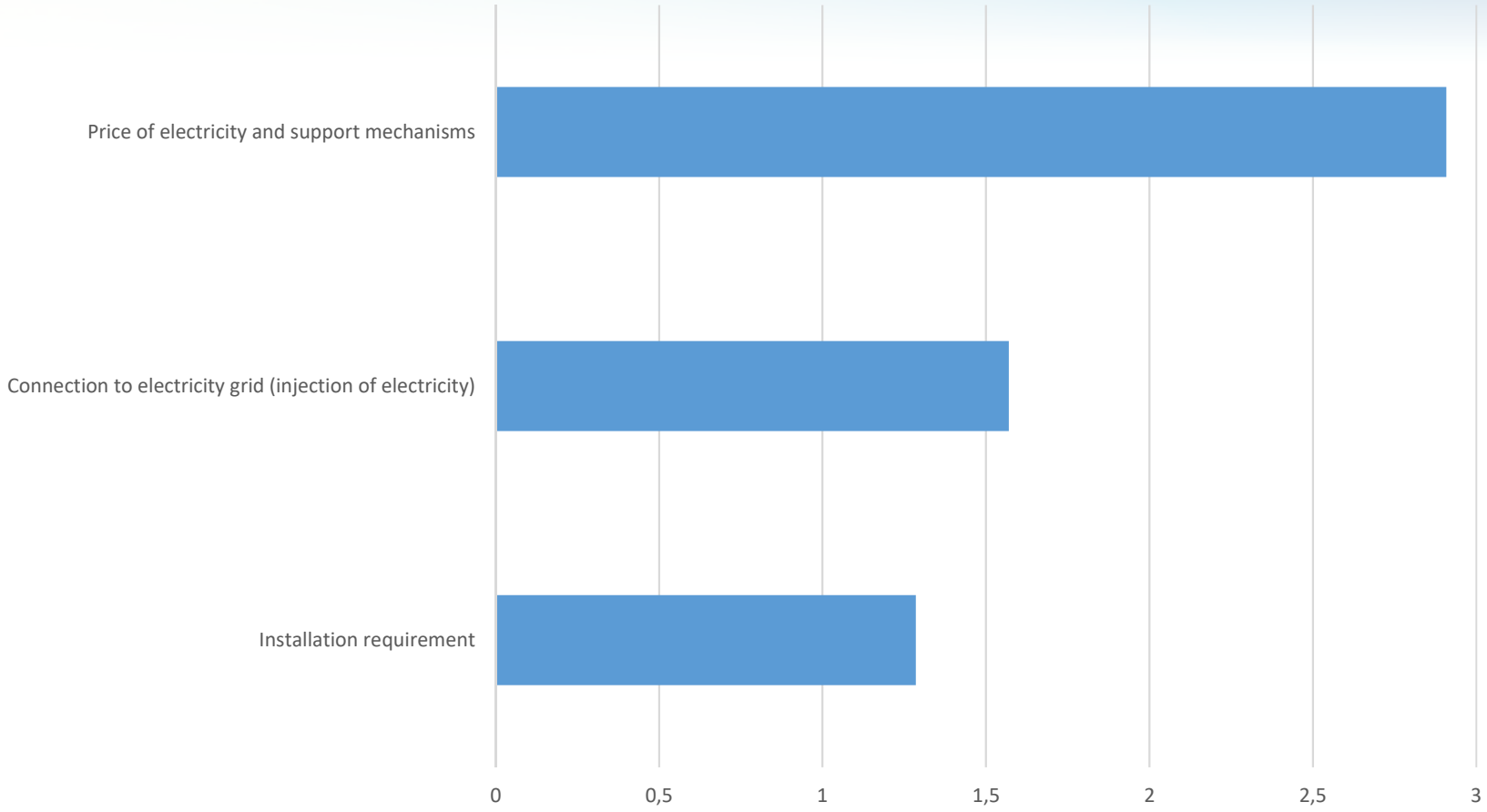
Gas Grid Issues
EU level Considerations

There are fundamental legal barriers which severely constrain or prevent H2 injection in EU Gas Grids

- Diverging H2 concentration levels in the gas grid
- Diverging H2 concentration levels at injection level (pre-mixing or not)
- Arrangements based on calorific value / Wobbe Index
- No remuneration / payment frameworks

The framework for permitting Power to Gas (P2G) plant and grid connection / injection requirements between the hydrogen supplier and the gas grid operators **should be included within relevant EU regulatory frameworks** to ensure comparable treatment across the EU.

Stationary Power
Severity of barriers



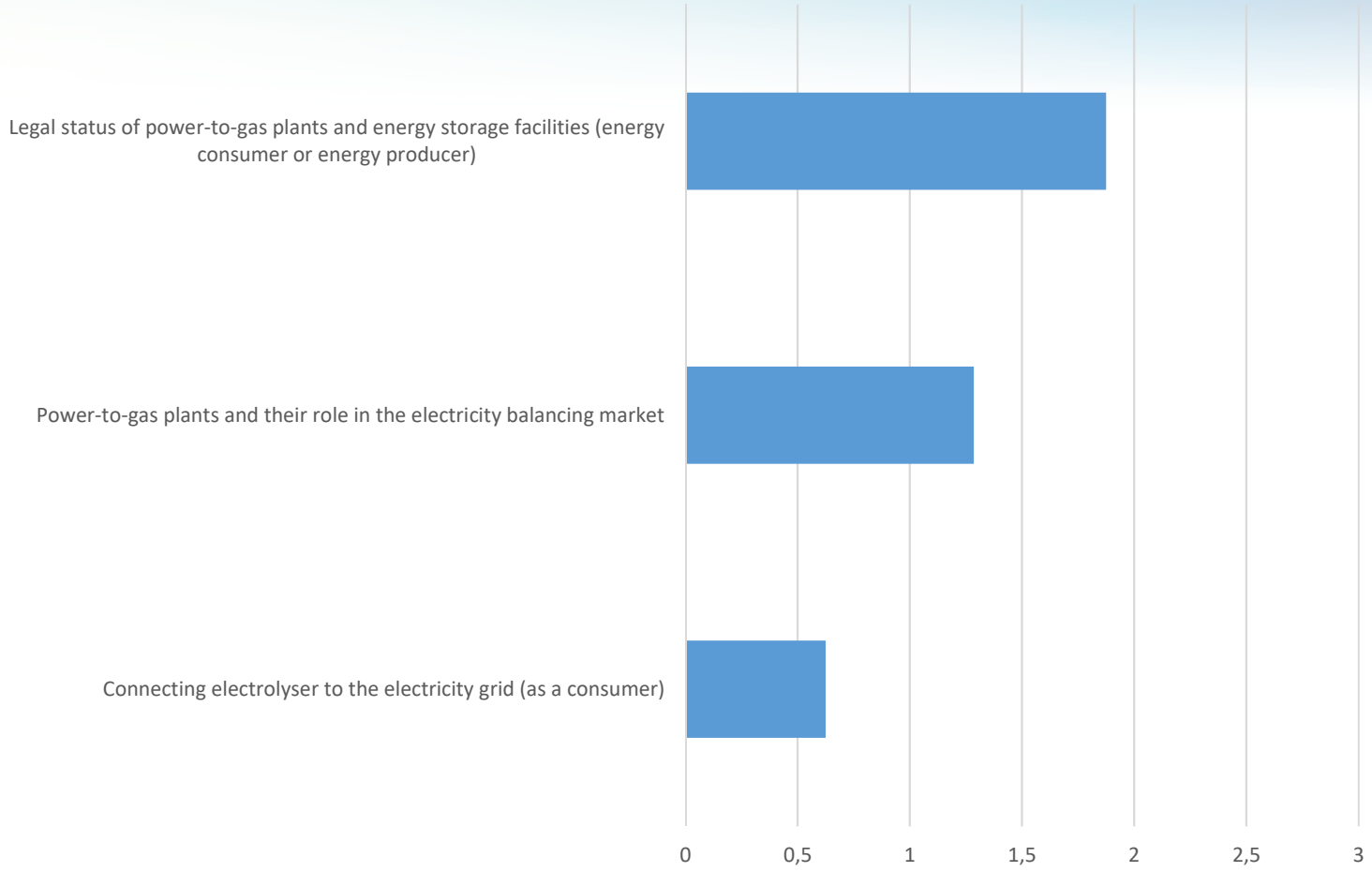
Stationary Power
EU level Considerations

There is no common EU framework for installation of FC micro-CHP units, however, no significant legal barriers were identified

- Stationary fuel cells enjoy the same treatment as any other heating appliances working on gas in regards to gas network connection.
  - Regulation (EU) 2016/426
- Large Scale (industrial) stationary power fuel cells not covered by HyLaw, however, would the EU ETS apply to Solid Oxide Fuel Cells producing over 20 MW of power?

Very few support mechanisms for FC-micro CHP systems. Existing measures unlikely to contribute substantially to mass deployment

Electricity Grid for Electrolizers and P2G facilities
Severity of barriers



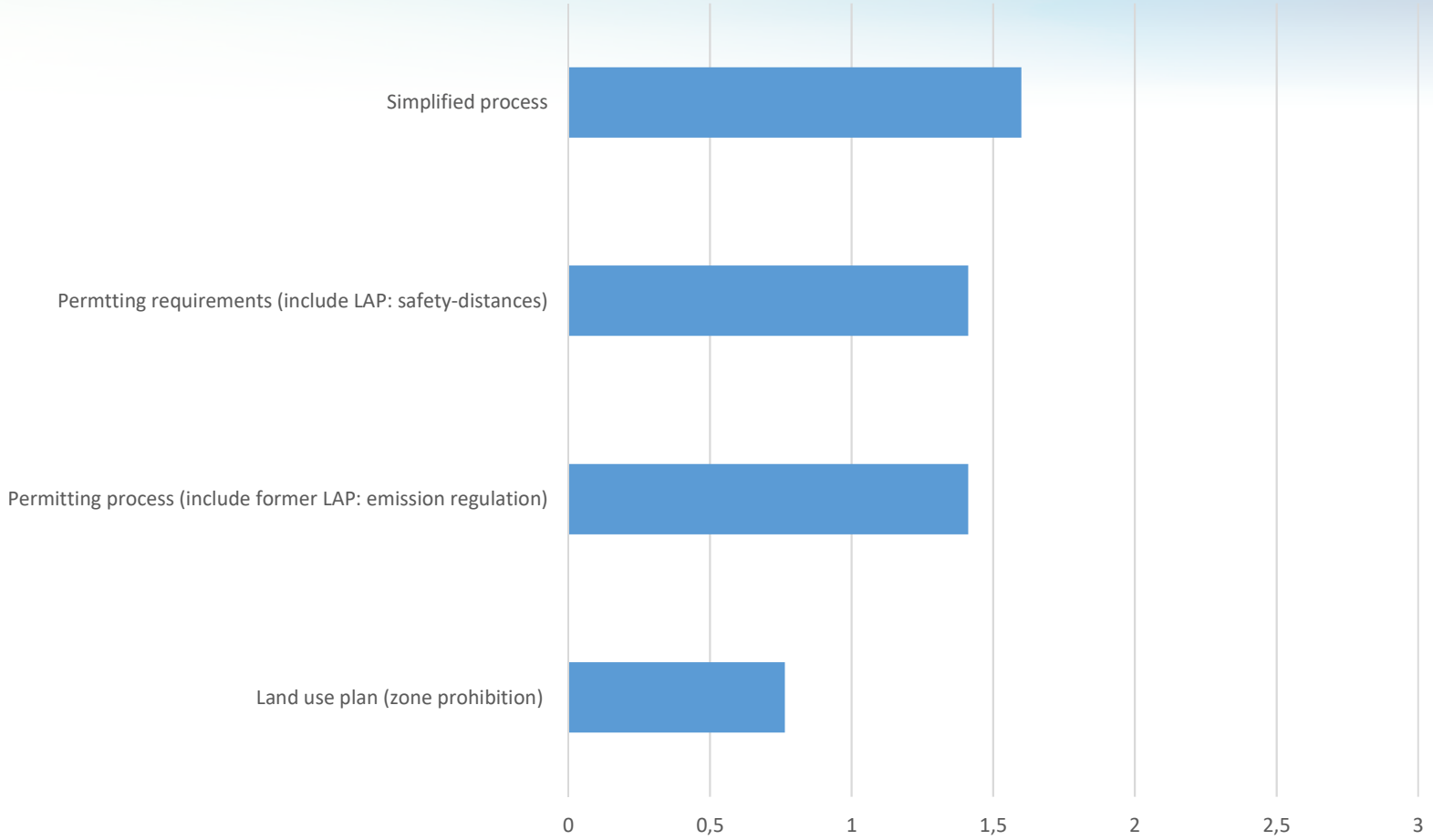
Electricity Grid for Electrolizers and P2G facilities
EU level Considerations

There is no clear and unequivocal legal position for P2G facilities recognized across both e-grid and gas grid networks

The **electricity grid** regulatory framework is generally supportive of hydrogen production from grid connected electrolyser systems*

- However, no provision for P2G systems under either e-grid or gas grid common rules. No MS has an established and coherent regulatory approach to P2G systems.
- P2G operate 'by exception' or under a delineated / time specified demonstration programme (unique set of arrangements and negotiations across multiple regulatory and safety agencies

Production and Storage of Hydrogen
Severity of barriers



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PEM

Production and Storage of Hydrogen
EU level Considerations (1)

- Production and Storage of Hydrogen – obligations set by **EU legislation**:
  - Risk Assessments (SEVESO Directive).
  - Health and Safety requirements and conformity assessment procedures, (ATEX Directive).
  - Integrated Environmental obligations, (IED)
  - Environmental Impact Assessment procedures, (SEA and EIA Directives).
  - Others
- Transposed into national law.
  - Large room for discretion in application (do they apply or not / under what conditions)
  - Differences in efficiency of procedures.

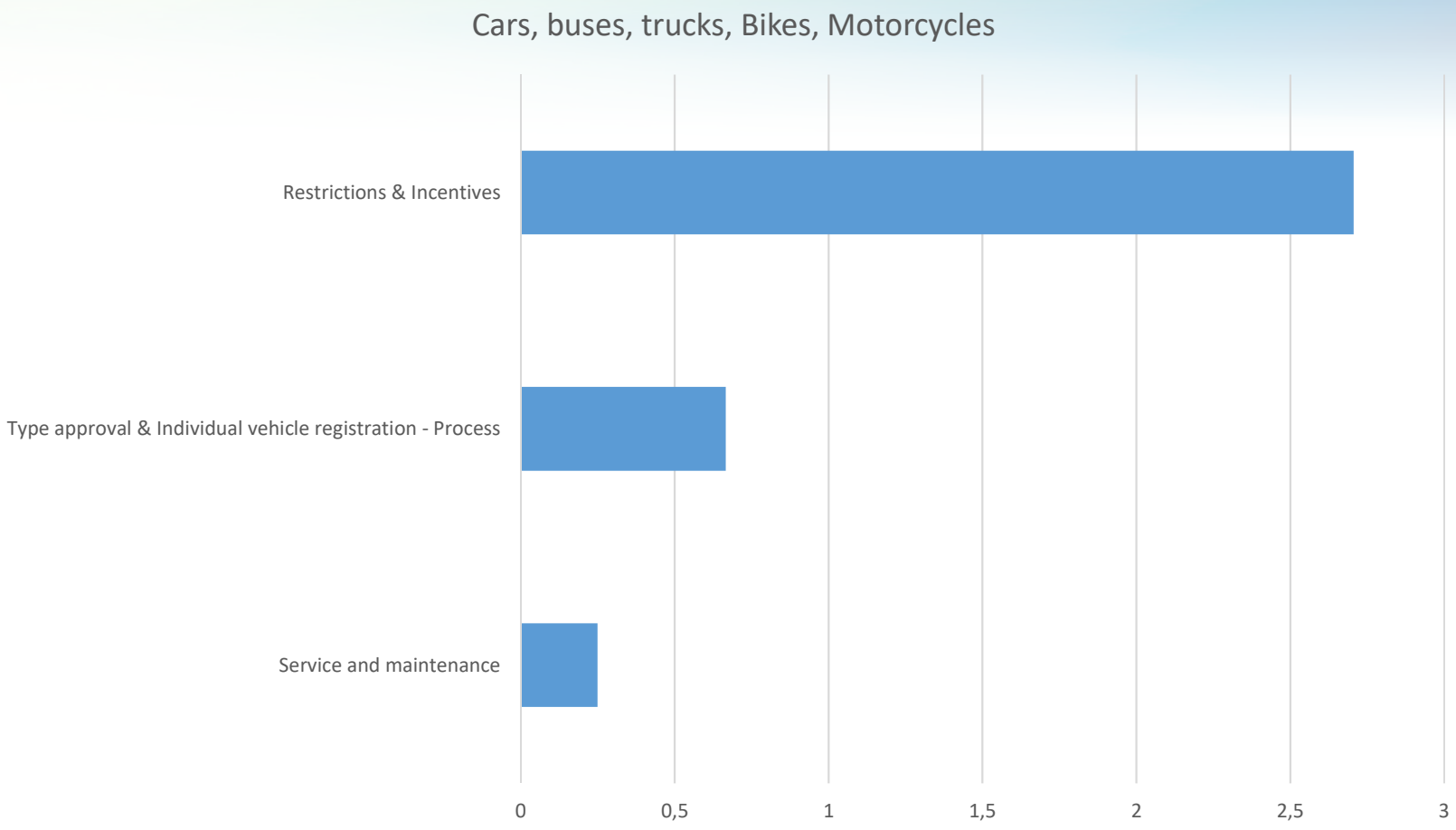
Production and Storage of Hydrogen
EU level Considerations (2)

- Horizontal (EU) problem:
  - Hydrogen production: same obligations irrespective of production method
  - SEA/EIA and IED obligations – (interpretation of industrial scale) – possible effect on small scale production (is it relevant?)

Directives designed to regulate large scale, chemical, emission emitting industrial processes but end up applying also to small scale, non-emitting processes.

- National level problem (each MS):
  - Permitting process is long, costly and its outcome is uncertain

Hydrogen Vehicles
Severity of barriers



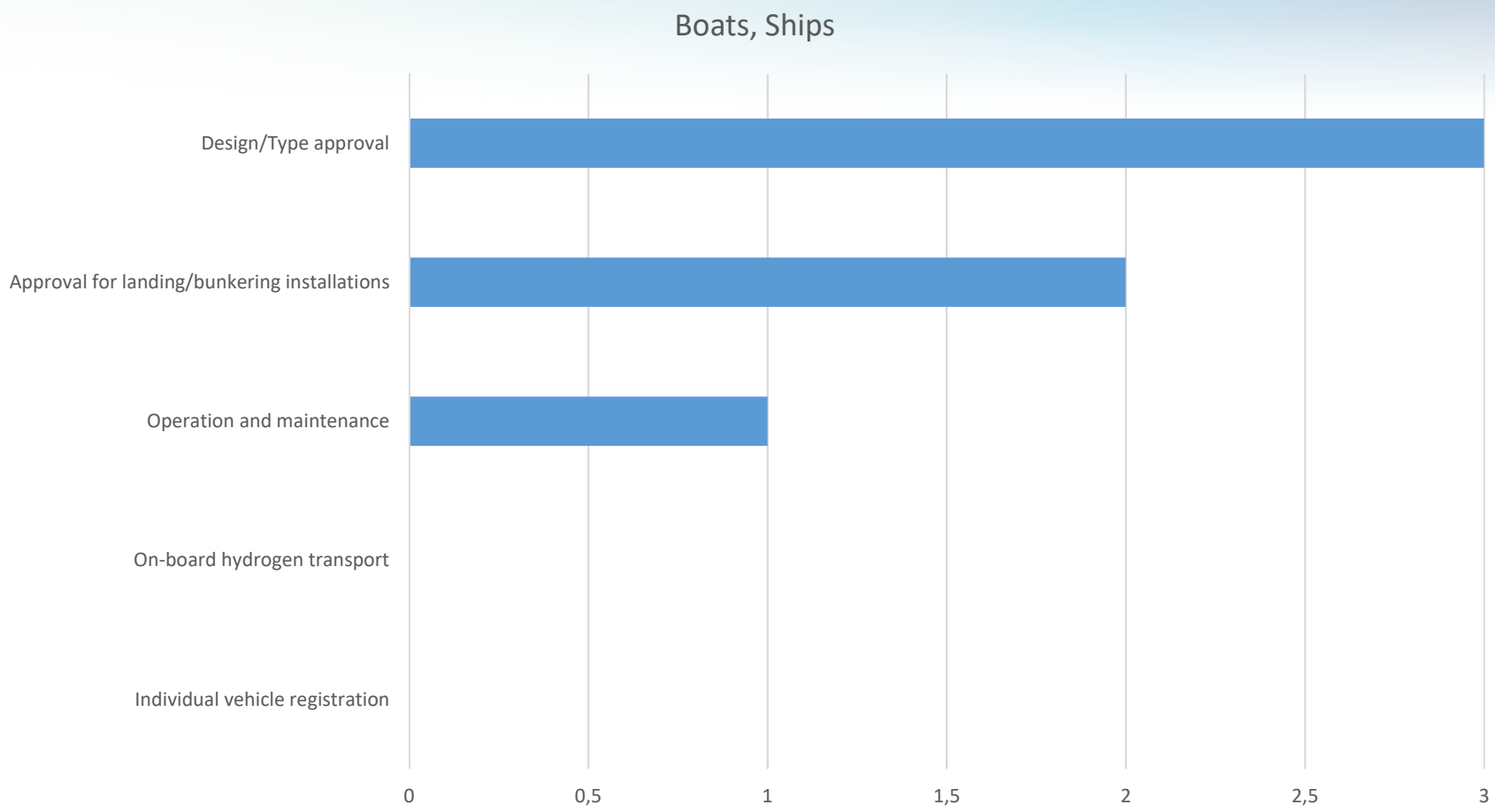
Hydrogen Vehicles
EU level Considerations

Type approval and registration of hydrogen road vehicles appears to be quite clear and well regulated

- Classes M (passenger cars and busses), N (trucks), O (trailers),
  - Type approval:
    - Directive 2007/46 (Framework Directive)
    - Regulation 79/2009 (Harmonized safety requirements for hydrogen-powered vehicles)
    - Regulation 692 / 2008 revised by Regulation 630/2012
    - Regulation (EU) No 406/2010 (technical specifications and test procedures);
  - Registration
    - Directive 1999/37/EC on the registration documents of vehicles, amended by Directive 2003/127/EC

Support mechanisms insufficient and sometimes favor other zero / low emissions alternatives

Hydrogen Vehicles
Severity of barriers

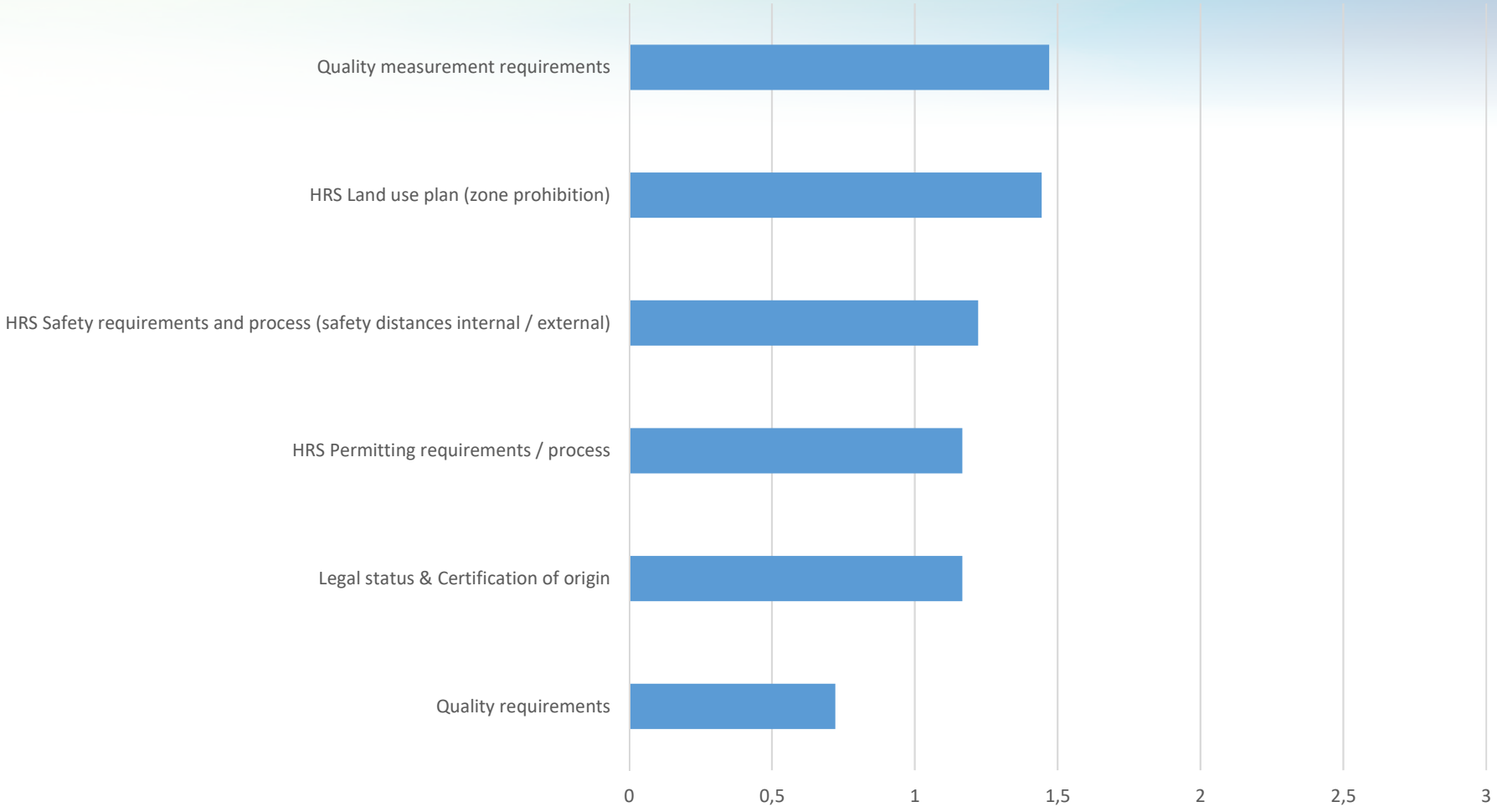


Hydrogen Vehicles
Horizontal (International) considerations

"Type approval" of Hydrogen fuel cell vessels is highly complicated due to the absence of rules

- Maritime (sea-going) vessels
  - International code for safety of ships using gases or other low-flash point fuels (**IGF Code)**
  - Type approval based on Alternative Design Assessment regulated by the convention of life at Sea (SOLAS II)
- Inland Vessels:
  - Directive 2016/1629/EU empowers CESNI (Comité Européen pour l'Élaboration de Standards dans le Domaine de Navigation Intérieure – CESNI) to develop standards in the field of inland navigation

Hydrogen as Fuel and HRS
Severity of Barriers



Hydrogen as Fuel and HRS
EU level Considerations (1)

A guarantee of origin system for green and low carbon hydrogen at European level is essential

- CertifHy : EU-wide guarantee of origin (GoO) scheme for low-carbon and renewable (green) hydrogen.
  - Separate the renewable character of the hydrogen (proven by the GoO) from the movement of the actual molecules
    - Allowed under the RED II subject to conditions

Hydrogen as Fuel and HRS
EU level Considerations (2)

Infrastructure development encouraged at EU level
Common standards and definitions under development

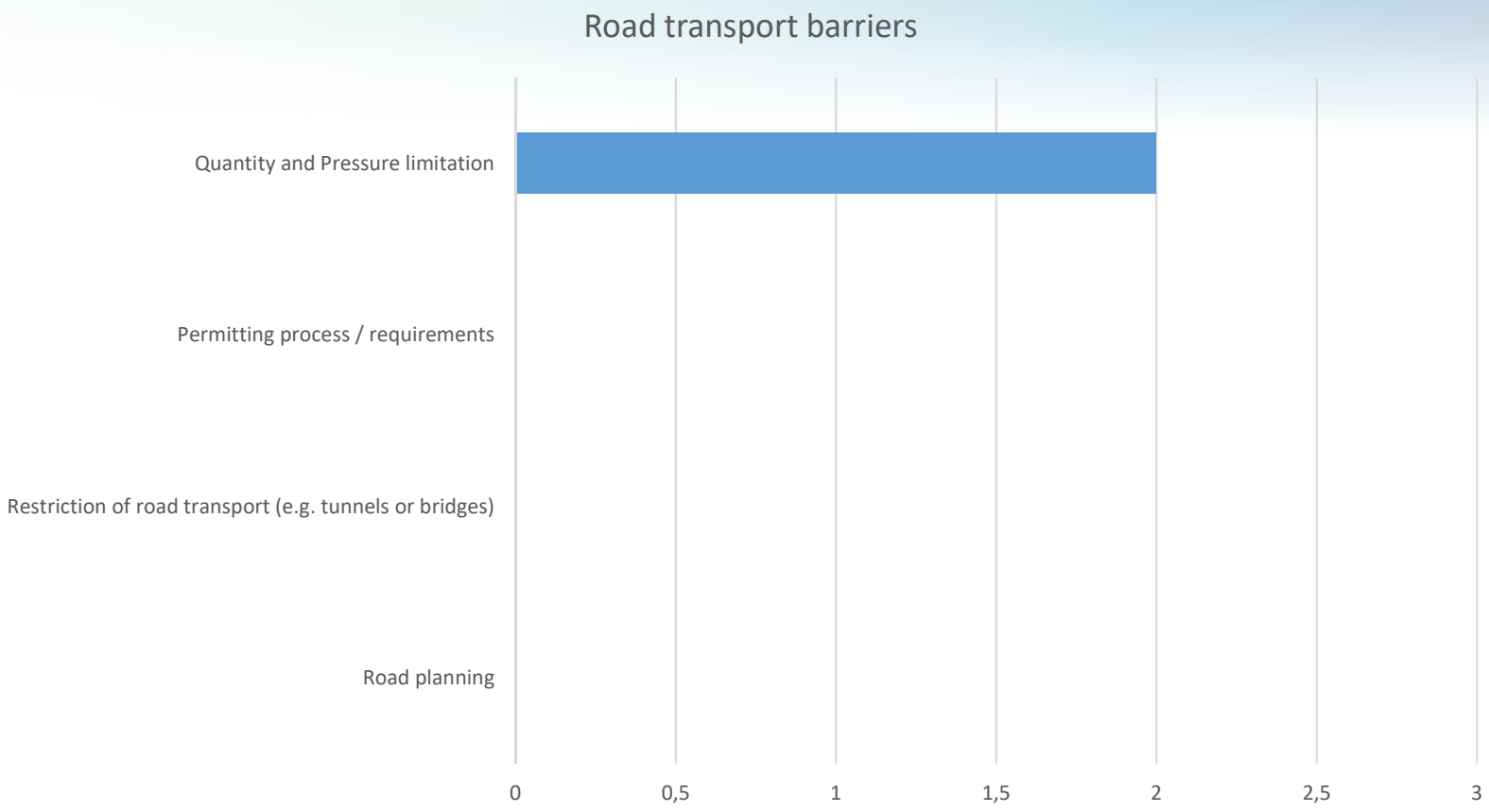
- Alternative Fuels Directive (Directive 2014/94/EU)
  - Minimum requirements for the building-up of alternative fuels infrastructure (HRS are optional for MS)
    - Mandatory in AFID 2?
  - Technical specifications for hydrogen refuelling points
    - Reference to existing standards
      - ISO/TS 20100 - Gaseous Hydrogen Fuelling
      - ISO 14687-2 – Hydrogen Fuel
      - ISO/DIS 17268 - Gaseous hydrogen motor vehicle refuelling connection devices
- Fuels Quality Directive
  - Defines renewable transport fuels (Definition also in RED II)

Hydrogen as Fuel and HRS
EU level Considerations (3)

Consumption of hydrogen (as a fuel) encouraged at EU level

- Mandatory targets for the overall share of energy from renewable sources: Renewable Energy Directive (RED)
  - RED II: Gross final consumption 32% renewable by 2030
  - RED II: Transport sector 14% renewable by 2030
    - Renewable liquid and gaseous transport fuels of non-biological origin (RFNBO) **taken into account when used as intermediate product for the production of conventional fuels.**
    - Additionality: new (renewable) hydrogen production capacity needed for calculating the target under conditions

Transport and Distribution of Hydrogen
Severity of Barriers



Transport and Distribution of Hydrogen
EU level Considerations

Apart from some local restrictions, no major, EU wide issues

Relevant Legislation:

- European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)
  - Directive 2008/68/EC on the inland transport of dangerous goods.
- Directive 2010/35/EU of 16 June 2010 on transportable pressure equipment
- REACH Regulation (Regulation (EU) No 453/2010)

But… standards for compressed hydrogen receptacles would need to be adapted to world with a higher demand for Hydrogen

Thank you for your attention

Questions?

HyLAW
Hydrogen law

Grant Agreement No 737977