

A photograph of a modern university building with large windows and a concrete base. In the foreground, there is a paved area with many bicycles parked in a rack. A concrete wall separates the bike area from a grassy area where two people are sitting. A row of trees lines the left side of the path. A blue semi-transparent box is overlaid on the right side of the image, containing the title and author information.

# Energy System Integration and Sector Coupling: Technology, **Regulatory** and Security Approaches

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# The EU Hydrogen Strategy

- “In the integrated energy system of the future hydrogen will play a role, alongside renewable electrification and a more efficient and circular use of resources” (p. 2)



Brussels, 8.7.2020  
COM(2020) 301 final

- Hydrogen as cornerstone of EDG and recovery from the COVID-19 crisis

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

A hydrogen strategy for a climate-neutral Europe

- Potential to bridge the decarbonisation gap by 2050
- Priority set on renewable hydrogen

# Key Regulatory Challenges for the Creation of an EU Hydrogen Economy

- No dedicated hydrogen act
- Regulatory requirements spread over various areas of EU energy aquis

*Key Regulatory Challenges for the Creation of an EU Hydrogen Economy*

Internal Market	New lead markets	Infrastructure
Unbundling	Industry application (EU Emissions Trading Scheme ('ETS'), Carbon Border Adjustment Mechanism ('CBAM'), Energy Taxation Directive, Carbon Contracts for Difference)	Ten-E
Third Party Access	Transport	Ten-T
Distribution and Transmission Tariffs		

# Towards an internal market for hydrogen

FIGURE 1

Mature European Hydrogen Backbone can be created by 2040

- H<sub>2</sub> pipelines by conversion of existing natural gas pipelines (repurposed)
- Newly constructed H<sub>2</sub> pipelines
- Export/Import H<sub>2</sub> pipelines (repurposed)
- Subsea H<sub>2</sub> pipelines (repurposed or new)
- Countries within scope of study
- Countries beyond scope of study
- ▲ Potential H<sub>2</sub> storage: Salt cavern
- Potential H<sub>2</sub> storage: Aquifer
- ◆ Potential H<sub>2</sub> storage: Depleted field
- Energy island for offshore H<sub>2</sub> production
- City, for orientation purposes



<https://gasforclimate2050.eu/publications/>

# Towards New Lead Markets



Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit (BMU)

Entwurf Stand: 21.04.2021

**Eckpunkte für eine Förderrichtlinie Klimaschutzverträge zur Umsetzung des Pilotprogramms „Carbon Contracts for Difference“**

# A dedicated Hydrogen Act?

- Using existing anchoring hooks to ensure that technology can be effectively and successfully deployed
- Regulatory challenges to the development of the “hydrogen economy” envisaged by the EU’s Green Deal
  - Upstream: need for financial and regulatory support for hydrogen production
  - Midstream: infrastructure and policy action needed to accelerate investments and avoid MS divergences

**DIRECTIVE 2009/31/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL**

**of 23 April 2009**

**on the geological storage of carbon dioxide and amending Council Directive 85/337/EEC, European Parliament and Council Directives 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC, 2008/1/EC and Regulation (EC) No 1013/2006**

**(Text with EEA relevance)**

**INSTRUMENT NEEDED**

- **Methods: regulatory sandboxes? – currently not foreseen at EU level**

# A dedicated Hydrogen Act?

- Other questions:
  - Addressing international and cross-border issues, such as hydrogen gas quality, safety, engineering standards, public procurement, planning, building and operating standards;
  - Certification of the carbon performance of hydrogen, i.e. guaranteeing that hydrogen imported into the EU import is not from fossil origin? (guarantees of origin/ global measuring of products with verification)



## Governing New Technologies in the Energy Transition – The Hydrogen Strategy to the Rescue?

open-access

Gökçe Mete, Leonie Reins

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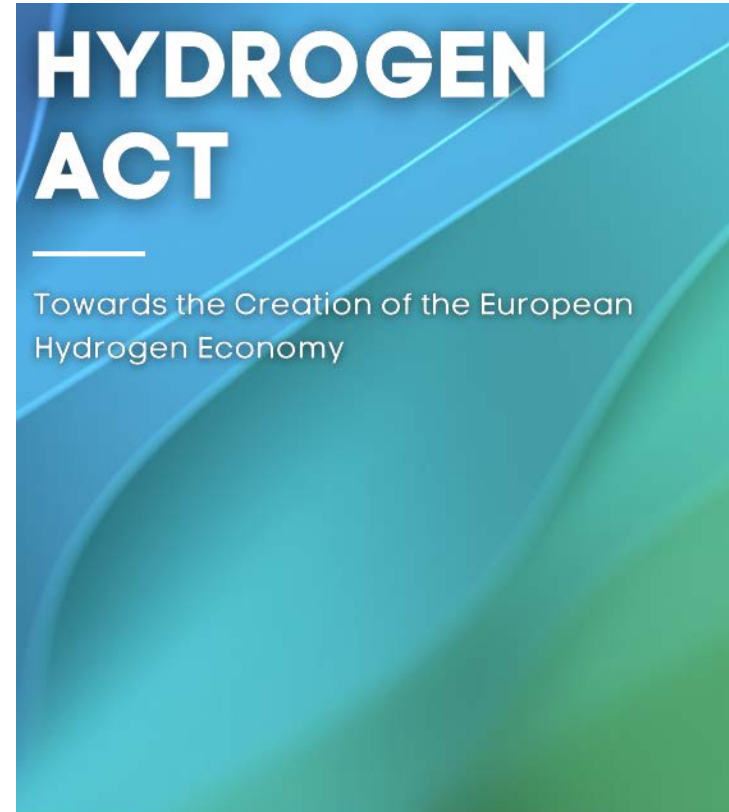
Full Text (PDF)

Full Text (HTML)

Abstract

Author Info

This article analyses the European Commission's Hydrogen Strategy with a focus on its broader implications for EU energy law. Given the specificities of the technology itself, existing regulatory instruments are not always apt to accommodate the wide-scale introduction of hydrogen into the energy mix. Indeed, from a legal perspective, hydrogen faces a vast number of challenges, which can be clustered into three main categories, namely challenges related to (1) the creation of an internal market for hydrogen, (2) the creation of new lead markets for hydrogen, and (3) infrastructure for hydrogen. The aim is to answer the question to what extent the regulatory challenges are already acknowledged and covered by the Hydrogen Strategy, and to the extent they are not, how the future steps in the hydrogen-related policy making process can effectively address them.



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Hydrogen Europe