



European  
Commission

JRC PORTFOLIO 03

## CLEAN HYDROGEN AND OTHER DECARBONISED GASES

In some high-energy demand sectors (such as parts of transport and industry) it is hard to decarbonise energy consumption by direct electrification. For these sectors, decarbonised gases and liquids can do the job, with renewable and possibly low-carbon hydrogen playing a pivotal role as feedstock and fuel. However, markets for decarbonised gases are not fully developed and there are policy and technology-related challenges including questions on energy efficiency, environmental impacts, and the possible intensification of water stress. The transition towards a mature infrastructure supplying decarbonised gases and liquids to users is complex and should take into account the need to guarantee security of energy supply. A coherent approach based on sound technical assessments can support the best solutions and can ensure the fulfilment of the 'energy efficiency first' principle.



### The portfolio aims to:

Provide a coordinated, harmonised approach to address sustainable production, transport, storage and use of hydrogen and decarbonised molecules including hydrogen-derived liquid fuels

Assess market arrangements, research and innovation and standardisation, circularity options, infrastructure and security of supply of decarbonised gases and liquid fuels

Develop methods for the assessment and certification of green-house gas emissions and environmental footprint, as well as benchmarks against other options for decarbonisation

## Delivering on anticipation, integration and impact of EU policies

- ▶ harmonising methods for assessing competitiveness, sustainability and ‘energy efficiency first’ principle of renewable and low carbon hydrogen and hydrogen-derived liquid fuels production and use,
- ▶ assessing the best options for the transport and storage of hydrogen in terms of safety, sustainability, energy and economic efficiency,
- ▶ analysing the effects of adding decarbonised gases to new and repurposed gas networks, possible associated market fragmentation and impacts on energy security,
- ▶ providing a coordinated approach to address the security of renewable and low-carbon hydrogen supply,
- ▶ monitoring and assessment of technological progress, including material criticality and water availability aspects.

## Time frame

The portfolio supports the EU policy goals in the field, with a **time horizon of 2030** for those captured under the REPower EU plan and a **mid-decade perspective** for the goals put forward by the Directive and Regulation on decarbonised gases and the Regulation on Security of Gas Supply.

## Main partners

### Partner DGs

CLIMA, COMP, EEAS, ENER, ENV, GROW, INTPA, MARE, MOVE, REFORM, RTD

### Selected stakeholders

ACER, Clean Hydrogen Joint Undertaking, Hydrogen Europe, CEN, CENELEC, IEC, IEA, IPHE, ISO

Hydrogen

Greenhouse gas emission

Decarbonised gases

Renewable energy sources

Hydrogen and nuclear

Decarbonised transport

Decarbonised industry

Harmonised gas markets

Technology progress

Energy security

Energy efficiency

Low carbon hydrogen production

Transport of hydrogen

Storage of hydrogen

Critical raw materials and circularity

## Find out more



### CLEAN HYDROGEN AND OTHER DECARBONISED GASES

<https://joint-research-centre.ec.europa.eu/jrc-research-portfolios/hydrogen>

## Science for policy

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