
Environment
Agency

Hydrogen: Environmental regulations and permits

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28th April 2025

HyDEX Summer School 2025

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Content

1. Background & Introduction
2. Hydrogen Value Chain
3. Hydrogen Regulatory approaches & requirements

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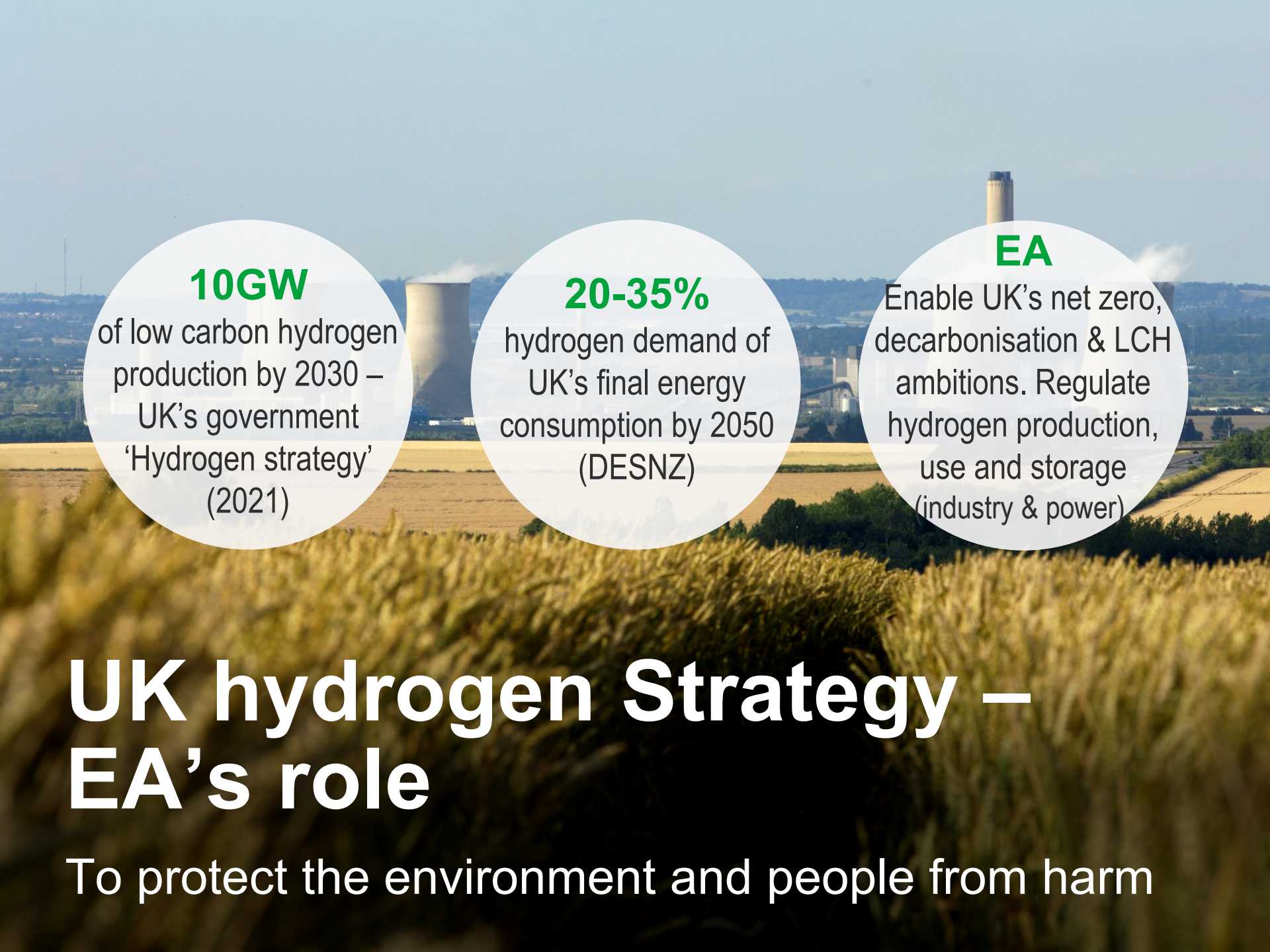
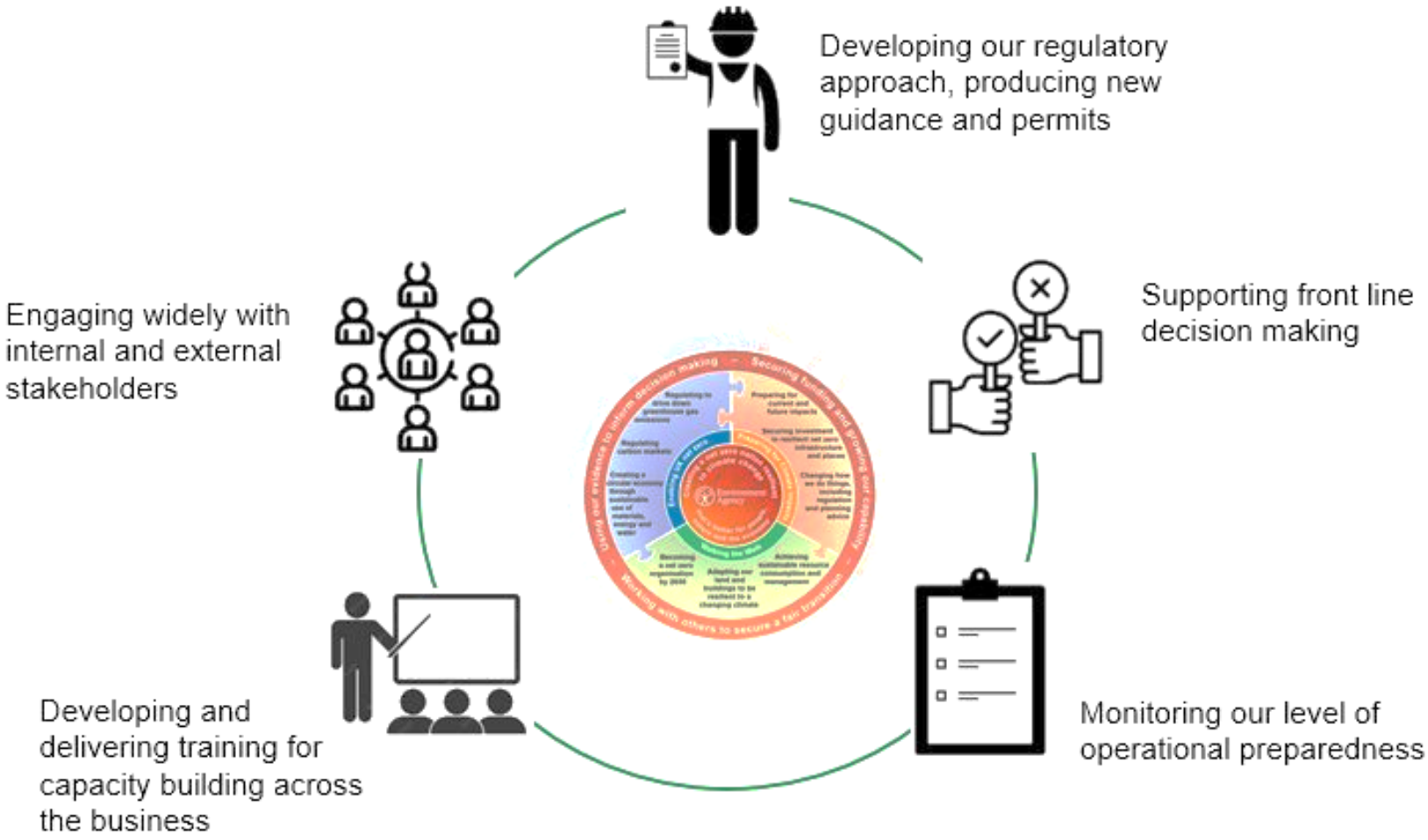


UK hydrogen Strategy – EA's role

To protect the environment and people from harm

EA's HCCUS Programme



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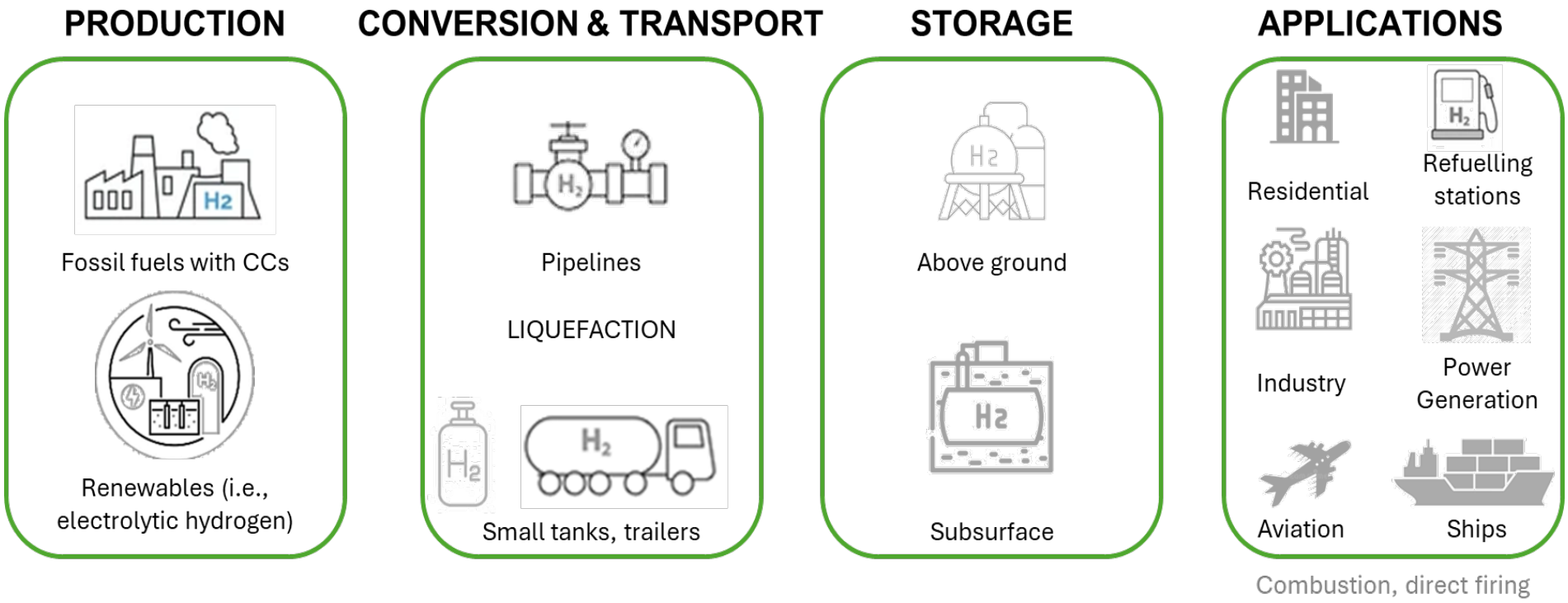
Hydrogen value chain



- Different requirements: technical and regulatory challenges. For example:
- Low Carbon hydrogen Standard (LCHS) for hydrogen producers to report GHG emissions; it defines what it constitutes ‘low carbon hydrogen’ up to the production point.
- Collaboration with DESNZ Hydrogen Fugitive Emissions teams as hydrogen indirect green house gas (GHG).

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Regulatory approaches

Best Available Techniques (BAT) &
Guidance for Emerging Techniques (GET)

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BAT

Best Available Techniques

Most effective and advanced stage in the development of activities and their methods of operation.

Practical.

Provide the basis for emission limit values and other permit conditions.

Prevent and, where that is not practicable, reduce emissions and the impact on the environment as a whole.

BAT
Best Available Techniques

Most effective and advanced stage in the development of activities and their methods of operation.

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GET
Guidance for Emerging Techniques

Emerging techniques: novel techniques for an industrial activity with potential higher level of protection to the environment or at least the same level but higher cost savings than BAT.

When there are no relevant BAT, BAT Reference documents (BRefs) or UK BAT documents, Environmental Regulators work with industry stakeholders to produce GET.

GET developed into BAT

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EA's Guidance (GET) for Hydrogen Production

Guidance

Hydrogen production with carbon capture: emerging techniques

Emerging techniques on how to prevent or minimise the environmental impacts of industrial hydrogen production from methane or refinery fuel gas with carbon capture for storage.

From: Environment Agency
Published 3 February 2023

Contents

Hydrogen production with carbon capture: emerging techniques - GOV.UK (www.gov.uk)

Guidance

Hydrogen production by electrolysis of water: emerging techniques

Emerging techniques on how to prevent or minimise the environmental impacts of hydrogen production by electrolysis of water.

From: Environment Agency
Published 28 March 2024

Contents

Hydrogen production by electrolysis of water: emerging techniques - GOV.UK (www.gov.uk)

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Regulatory requirements

Permits

COMAH

Air

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Hydrogen Regulatory

Production, Use and Storage

Relevant to electrolysis

E P R

Environmental Permitting Regime

COMAH

Control Of Major Accidents Hazards

WATER

Water Abstraction Licences

WATER

Discharges to water

PUBLIC CONSULTATION

Aarhus Convention FoI and EIR

PLANNING CONSULTEES

HSC, Pipelines Developments Advisory

EMISSIONS

UK Emissions Trading Scheme (CO_2)

DO NOT Regulate: pipelines, vehicles, standalone hydrogen storage (EPR), domestic use

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Regulatory guidance and technology development

Innovation projects

How to know if you need an environmental permit?

Control of Major Accident Hazards Regulations: COMAH

When the research and development exemption for installations applies

The Environmental Permitting Regulations contain an exemption for installations or plant "used solely for research, development or testing of new products or processes".

The Environment Agency considers that at existing installations, this will apply to stand-alone research and development activities.

This exemption for research or trial activity does not apply to:

- trials that are more closely associated or integrated with permitted activities
- waste incineration plants or waste co-incineration plants
- mobile plants carrying out Part B activities

If you are not sure whether the exemption applies to you, or if you do not operate a permitted installation, please contact the Environment Agency.

Also consider that other regulations may apply. For example, the Control of Major Accident Hazards (COMAH) Regulations and hazardous waste controls.

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Regulatory guidance and technology development

Innovation projects (cont.) – Air implications

Carbon Capture and Storage

- Post-combustion carbon dioxide capture: emerging techniques

Hydrogen Production and Use

- Inorganic chemicals sector: additional guidance
- Hydrogen production with carbon capture guidance for emerging techniques.
- Hydrogen production by electrolysis of water: emerging techniques

We are in the process of developing other guidance to support hydrogen production and use. Please refer to

- Technical guidance for regulated industry sectors: environmental permitting for our latest publications.

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Regulatory guidance and technology development

Innovation projects (cont.) – Air implications

Gasification	• Gasification, liquefaction and refining installations: guidance
Anaerobic Digestion (AD)	• Regulation | Anaerobic Digestion (biogas-info.co.uk)
Emissions to Air	• Air quality in planning • Emissions Trading Scheme (ETS)

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Why is important to know regulations as researchers?

R&D projects are working towards development.

Knowing regulatory requirements provides you with:

- Sense of awareness for technology deployment
- Think about what regulatory parameters the technology should comply with
- Allow you to identify further gaps (i.e., capable and existent measurement devices, etc.)

- Opportunity to identify well-established technology (BAT), technology being developed (GET).
- Consider challenges for technology deployment & implementation.
- Identify needs for the sector.
- Think about the full picture.

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Thank you

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