

HYDROGEN – an innovative solution for carbon neutrality?

CONTEXT & WHAT WE KNOW

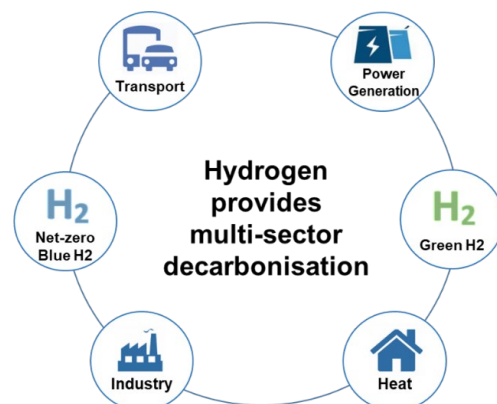
Results from UNECE Pathways to Sustainable Energy Project show:

- Current climate pledges do not meet the 2°C target.
- ECE countries must cut/capture at least 90Gt of CO2 by 2050 to meet 2°C.
- Attaining carbon neutrality is the first milestone on the pathway to sustainable energy.
- Hydrogen's role in achieving carbon neutrality needs to be assessed.

UNECE has launched a project on carbon neutrality to understand the implications and opportunities to inform decision makers about effective policy and technology options. Hydrogen could play a critical role in decarbonising otherwise hard-to-abate sectors.

OPPORTUNITIES & IMPACT AREAS

Existing gas infrastructure is key for hydrogen to emerge as a new fuel. In the UNECE region there is large potential to enhance the interplay between renewable energy and natural gas as renewable energy sources are abundant and gas infrastructure is well developed. Countries seek to develop flexible systems in which decarbonised gases will be a key component. Many integrated energy models suggest that the future energy system will rely on efficient interplay between electrons (electricity) and molecules (gas). It is important to identify potential opportunities for sector coupling and integration to better understand how and where hydrogen can be produced cost-effectively.



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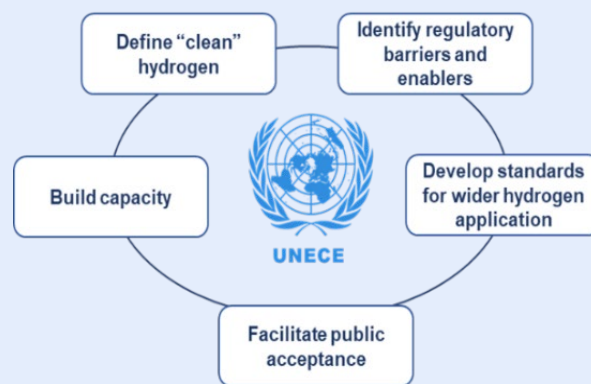
INHOUSE TOOLS & STRATEGIC PARTNERSHIPS

UNECE has created a Task Force on Hydrogen under the auspices of its Groups of Experts on Gas and on Renewable Energy. The Task Force will advise the Committee on Sustainable Energy on how to help the UNECE member States meet their international commitments in decarbonising energy systems by harnessing hydrogen and other decarbonized gases. In addition, UNECE's network of experts is complemented by strategic partnerships with relevant international organizations and initiatives (such as partnerships and collaboration with the World Energy Council under the Council's initiative Hydrogen Global, Hydrogen Europe, ISO, IEA, and so forth).

Modelling infrastructure developed for UNECE's project on Pathways to Sustainable Energy provides a unique scientific and technology-agnostic approach to analyse the potential for hydrogen under various scenarios.

IMPACT ACTIVITIES & EXPECTED RESULTS

UNECE recently co-hosted an online workshop focussed on the implications of hydrogen for regulatory enablers and technical standards. The dialogue convened more than 70 policymakers and business leaders, with representation of the whole energy system value chain and adjacent non-energy sectors.



The following focus areas were identified for the UNECE activity on hydrogen forward:

- **Define 'clean' hydrogen** – clarify the options for a range of green and blue hydrogen-based fuels/production pathways based on life-cycle analysis. Interactions between electricity and gas could create the foundation for a hydrogen economy, but it will be necessary to develop policy recommendations on how to leverage existing gas infrastructure to accept an increased fraction of hydrogen.
- **Identify barriers and enablers.** Deployment of hydrogen depends on policies toward existing gas and electric infrastructure. Regulations need to be revisited to allow wider network development planning, and a regional regulatory strategy is required until a hydrogen market becomes viable.
- **Develop standards for wider application of hydrogen,** including notably the range of market segments: i) hydrogen as energy for domestic use; ii) transportation of hydrogen (transmission and distribution); and iii) process industries for raw materials.
- **Harmonisation** is needed between different authorities UNECE, ISO, IMO and countries.
- **Facilitate public acceptance.** Exchange international and cross-sector strategic knowledge of the potential of a hydrogen economy for the region. Undertake a social awareness campaign to bring hydrogen closer to people in all segments.
- **Build capacity.** As part of a capacity building and outreach strategy, UNECE is planning to deliver a series of Workshops at the UNECE Committee on Sustainable Energy in Geneva in 2020 and 2021, 2021 Energy Week in Nur-Sultan, Kazakhstan, the 25th World Energy Congress (WEC) in St Petersburg, Russia, etc.

