UNECE Workshop:
Attaining Carbon Neutrality: The Role of Hydrogen

ENERGY

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REPORTING FROM BREAKOUT GROUPS

PRODUCTION

TRANSPORT/STORAGE

USE

UNECE

KEY TAKEAWAYS

The Group of experts on **Production** of Hydrogen agreed that:

1. All low-carbon technologies have to be considered on their own merits to produce clean hydrogen;
2. Focus needs to be on efficient emission reduction with a technology neutral approach;
3. Promoting research and innovation in all hydrogen technologies is crucial;
4. Policies shall focus on life-cycle carbon footprint and CO_2 abatement cost;
5. Fast emission reduction is cost efficient achievable with other fossil fuel replacement by natural gas;
6. Natural gas plays an important role and will continue to play a role with more intermittent renewables in the system;
7. There are lots of technical and resources limitations for electrification and renewables deployment to meet all future demand.

KEY TAKEAWAYS

The Group of experts on **Production** of Hydrogen recommends**:**

- **Policy**: Design and implement supportive mechanisms like Guarantees of Origins across UNECE regions to address initial green premium before learning-by-doing and scale effects ensure a further cost reduction for clean hydrogen projects
- **Finance**: Elaborate and implement innovative risk sharing schemes between public and private investors to finance clean hydrogen production projects
- **Industry**: Ensure and contract long-term offtake commitments for clean hydrogen produced for industrial, transportation, heating and e-fuels projects
- Cross-border cooperation must be strengthened with UNECE support;
- Strategies containing realistic targets should be developed at global, regional and national level;
- New policies would have to consider existing and future infrastructure needs.

KEY TAKEAWAYS

The Group of experts on **Transport and Storage** of Hydrogen agreed that:

1. All technological and financial options for hydrogen transmission and storage should be considered taking a technologically-neutral stance and discussed from a level playing field perspective. The full value chain should be performed considering both cost-effective solution and footprint impact based on a LCA approach;
2. The transition to a future hydrogen economy needs to be achieved in a cost-effective way;
3. The retrofitting and repurposing existing natural gas infrastructure would accelerate the hydrogen transition. Blending is a not regret option. This will also minimise the NIMBY issue when new infrastructure is built;
4. ECE member States are encouraged to use the gas infrastructure as a cost-effective entry point for developing low-carbon alternatives, such as hydrogen;
5. Gas DSOs are able to bring renewable and decarbonised gases to millions of local end consumers.

KEY TAKEAWAYS

The Group of experts on **Transport and Storage** also agreed that:

6. The role of storages is essential for the energy system for SoS, modulation, seasonal storage. The Global H2 demand growth will increase demand of high-capacity and deliverability of storage services;
7. There is a need for adoption of high-level regulatory principles based on the current regulatory framework for gas (i.e.. Mirroring);
8. There is a need of large projects connecting hydrogen production areas to consumption areas (i.e. from the south of Europe to north) to scale-up the deployment of hydrogen economy;
9. UNECE has a relevant role to play in addressing the inherent Hydrogen international dimension, especially by providing information and recommendations which facilitate the connection of production centres with the consumption centres, frequently located in different countries or worldwide regions.

KEY TAKEAWAYS

The Group of experts on the **Use** of hydrogen agreed that:

1. Clean hydrogen (RE H2 and FF w CCS) has the potential to cut 45-60% of global anthropogenic emissions and decarbonize hard-to-abate sectors – long-haul transport, steel and chemicals production, heating, ammonia, and long-term power storage;

2. Signals show push for hydrogen on the road by 2030 across US and Western Europe – ca. 9 million FCEVs (small compared to the potential need) and should be encouraged by policy and incentives in order to massively scale up;

3. Current major industrial hydrogen uses include refining, ammonia and methanol.

KEY TAKEAWAYS

The Group of experts on **Use** of hydrogen also agreed that:

4. Industry is the main early adopter. Existing and new hydrogen applications can be a catalyst for early deployment. Industrial applications for steel, cement and high-temperature applications should be supported and incentivised;

5. Salt cavern storage - feasible and flexible solution for hydrogen storage;

6. Integration is the key for hydrogen deployment and experts call for integrated cross-sector approaches ;

7. The full carbon footprint must be immediately assessed and brought to net-zero in a zero-carbon future.