

## **Invest in hydrogen for robust, resilient and sustainable growth as a response to the COVID-19 pandemic**

*The Hydrogen Council, a global coalition of 90+ CEOs working to enable the energy transition through hydrogen, calls on governments around the world to invest in hydrogen as part of their COVID-19 recovery plans. Hydrogen technologies can empower a more robust, resilient and sustainable economy; however, urgent action and global collaboration is required to deliver on their unique potential.*

### **What is at stake**

The COVID-19 pandemic has caused a massive contraction in many industries, in addition to the devastating global health impact. The response to this unprecedented economic and societal shock will be a defining moment for the energy transition and international efforts to combat the climate crisis.

To limit global warming to 1.5 degrees Celsius and prevent the most serious potential impacts of climate change, including increased vulnerability to pandemics<sup>1</sup>, we need long-term thinking and massive investments in game-changing, systemic solutions such as hydrogen.

Governments are increasingly recognizing hydrogen's ability to decarbonize sectors that are otherwise impossible or difficult to abate – such as intensive personal or collective transport, freight logistics, industrial heating and industry feedstock – and its role in improving energy security. Meanwhile, industry leaders across the automotive, chemicals, oil and gas, and heating sectors look to low-carbon hydrogen as a serious alternative to reach their increasingly ambitious sustainability objectives.

### **What we recommend**

The Hydrogen Council joins the International Energy Agency and other leading organisations in a call to accelerate clean energy innovation and firmly place the energy transition at the heart of all recovery measures<sup>2</sup>.

As a global advisory body, we stand ready to share the Council's extensive knowledge and expertise and serve as a partner to governments working to design economic recovery plans with hydrogen as part of their strategy.

We fully acknowledge that different countries have their own unique set of circumstances, priorities and approaches. However, the following principles can serve as general guidance world-wide:

1. As a basis, we recommend that hydrogen be part of any national or international recovery efforts and stimulus measures, as its systemic role will be key to completing the massive transformation required to deliver a truly sustainable, secure and resilient energy system.
2. Economic recovery measures should support large scale initiatives that can accelerate cost competitiveness of hydrogen with a focus on the 18 applications identified in the "Roadmap to Hydrogen Competitiveness"<sup>3</sup>.

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<sup>1</sup> (Belova, et al., 2017)

<sup>2</sup> [Special Report on Sustainable Recovery, IEA, 18 June 2020](#)

<sup>3</sup> [Roadmap to Hydrogen Competitiveness, Hydrogen Council, 2020](#)

3. All renewable and low-carbon hydrogen production pathways should be considered and supported, as this will enable a competitive market between technologies and ensure that existing assets are used and converted to increase system resilience.
4. Transport is responsible for a quarter of direct global CO<sub>2</sub> emissions from fuel combustion. Investment to scale up hydrogen used in transport-related applications is needed to reduce costs and ensure there is sufficient downstream infrastructure available. Along with direct electrification, hydrogen solutions (such as fuel cell vehicles and hydrogen-derived e-fuels) will be needed to fully decarbonise the transport sector.
5. Renewable and/or low-carbon hydrogen can contribute to decarbonisation of industry now and should be supported by a mix of low-carbon hydrogen value support schemes and dedicated support for scale projects for the use of hydrogen as a new fuel or feedstock for hard-to-abate sectors such as steel and chemicals.
6. Specific new support schemes are needed to overcome remaining challenges. These tools may include public-private partnerships to overcome market failure situations on the infrastructure side, contracts-for-difference or dedicated multi-annual mechanisms (such as grants and tax incentives) to offset the premium of renewable and/or low carbon hydrogen to end consumers.
7. Global collaboration is a key prerequisite to enabling a robust marketplace that spurs competition and innovation, especially when it comes to harmonisation of codes, standards and regulations. Similarly, seeing ambitious strategies put in place in a handful of leading geographies is encouraging; however, this may not be enough to scale hydrogen to the level needed to achieve our shared climate targets. A comprehensive global action is required.

The Hydrogen Council estimates that hydrogen could deliver 18% of global energy demand, abate 6 Gt of CO<sub>2</sub> annually and create 30 million jobs by mid-century. For many industry sectors, that is just one investment cycle away. By investing today, governments can stimulate employment throughout the value chain, from construction and utility workers, office support functions and highly skilled engineer and university resources to address the challenges that a complex sector build-up presents. Innovative small businesses through large multinational finance and energy companies are investing in this space, and government support to foster growth will ensure the benefits are felt throughout the value chain and the entire economy.

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#### **About Hydrogen Council**

*The Hydrogen Council is a CEO-led initiative that uses its global reach to promote collaboration between governments, industry and investors, and to provide guidance on accelerating the deployment of hydrogen solutions around the world. The Hydrogen Council acts as a business marketplace, building a comprehensive hydrogen economy and shifting the perception of hydrogen globally. In addition, the Hydrogen Council serves as a resource for safety standards and an interlocutor for the investment community, while identifying opportunities for regulatory advocacy in key geographies. The coalition of 92 members including large multinationals, innovative SMEs and investors collectively represents total revenues of over €18.9 trillion and over 6.5 million jobs around the world. To find out more visit [www.hydrogencouncil.com](http://www.hydrogencouncil.com) and follow us on Twitter @HydrogenCouncil.*

## ANNEX - COVID-19: Hydrogen in recovery plans around the world

The Hydrogen Council collaborates with partners around the world to enable hydrogen scale-up. The Council recently brought together its members together with hydrogen industry associations from Australia, China, Japan, South Korea, New Zealand, Europe, the USA, and Canada to assess what kinds of plans and measures governments are putting in place in the context of COVID recovery and whether and how hydrogen is a part of their thinking. As a contribution to the debate, the below data assembled by the Council in collaboration with partners in key markets, provides a factual overview of the situation as of early July 2020. It does not represent the Council's opinion.

### AUSTRALIA

- At this stage, there is no specific COVID-19 economic recovery support targeting hydrogen.
- However, Australia has put in place a National Hydrogen Strategy that provides a framework for hydrogen policy development although the document itself does not set specific targets.
- Aspiration target for 'H2 under 2' means that hydrogen would be able to be produced for less than AUD2 per kg at the point of production by 2030.
- Australia sees enormous potential for renewable energy exports of hydrogen but policy generally takes a 'technology agnostic' approach to production pathways.
- State governments are also developing hydrogen funding programmes and policy support (e.g. blending targets).
- Funding for hydrogen from the Australian Renewable Energy Agency (ARENA), AUD70m and Clean Energy Finance Corporation (CEFC), AUD300m. ARENA is grant funding, CEFC is low cost finance.

### CHINA

- China's COVID-19 recovery packages cover a wide range of areas including the energy transition and renewable energies, which includes hydrogen.
- China has defined hydrogen fuel cells as an important part of its national strategy for GHG abatement and has a long-term plan for hydrogen development covering the complete hydrogen value chain from production, storage, delivery and refuelling to end users both in mobility and stationary applications.
- China already provides various financial support for hydrogen development, both at the central and local government levels, including subsidies for FCEVs and hydrogen refuelling stations.
- China has chosen the balanced development of green, blue and grey hydrogen in short term, with the long-term commitment to green hydrogen.
- China is currently updating its Hydrogen Fuel Cell Vehicle Technology Roadmap 2.0 (2020-35), which will be released in the second half of this year. China released the first edition of its FCV Roadmap (2016-2030) in 2016.
- It is expected that China will release its updated national hydrogen policy soon, which will have significant impacts on China's energy and automotive sectors.

### JAPAN

- The Japanese Government does not have a clear recovery package to link hydrogen/climate change action based on COVID-19 recovery.
- However, the Japanese government has set hydrogen as one of the key elements of its sustainable energy policy and published "The Strategic Roadmap for Hydrogen and Fuel Cells" to realize a 'Hydrogen Society'. The Roadmap sets out the plan to develop commercial-scale and international hydrogen supply chain to procure 300,000 tons of hydrogen annually by around 2030.

### **SOUTH KOREA**

- The Korean government has already allocated budget (around 750 mil US\$) to promote hydrogen economy in 2020, covering all parts of the value chain (production, distribution, end-use).
- The third government supplementary budget bill – proposed to alleviate the negative economic impact from COVID-19 – includes approx. 3.72 mil US\$ for R&D of green hydrogen production and hydrogen storage technologies and 2.70 million US\$ for improving safety of hydrogen refuelling systems.
- On 14 June 2020, the Ministry of trade and industry announced that approximately 34 billion won will be established to accelerate Korea’s hydrogen plans. The estimated 34 billion won fund includes 28.9 billion won in existing indirect investment and at least 5.1 billion won in private and government funds.
- In addition, the government is planning to invest 337.3 million euro for Korea’s Green New Deal to be set up as a driving force of the economy post COVID-19. Hydrogen is included in this plan.

### **EUROPEAN UNION**

- The EU has proposed a COVID-19 recovery package of €750bn (€500 billion grants and €250 billion loans) that will run until 2024. The final amount and division between grants and loans are subject to final agreement by EU member states.
- Hydrogen (full value chain) is included in the recovery package but is pooled with other technologies e.g. 5G, artificial intelligence, offshore renewable energy.
- The funding could come in the form of grants or loans. To ensure consistency with the Green Deal (the EU’s growth strategy), recovery plans and investments will have to follow “the green oath to ‘do no harm’”.
- A standalone Hydrogen Strategy and a Strategy for Energy System Integration will be published on 8 July 2020. A dedicated legislative package will follow in June 2021.
- Legislative proposals are also planned for 2020 and 2021 on transport and energy infrastructure, which we expect to deal with hydrogen (among other technologies).

### **GERMANY**

- The German Government has agreed a €130 billion stimulus package in response to COVID19. The package foresees €7 billion EUR investments (in the form of investment grants or on the ‘carbon-contracts-for-difference’ approach) for hydrogen.
- The 7bn€ support measures include:
  - 5GW electrolyser capacity installed by 2030 and another 5GW by 2040.
  - Funding for CAPEX and support mechanisms OPEX of Green H2 projects based on a Carbon Contracts-for-difference approach.
  - Lowering of energy taxes/levies to provide “cheaper” electricity to electrolyser projects.
  - Increase of hydrogen refuelling stations for Heavy-Duty applications in mobility
  - Support for green hydrogen in aviation applications & further R&D on electric aviation (battery & fuel cells)
  - An extra €2 billion will also be used for Federal support for energy partnerships with countries that have low-cost access to RE, with hydrogen technologies “made in Germany” to export hydrogen back to the EU.

### **USA**

- To date, clean energy, including hydrogen, has not been addressed by US federal government stimulus or recovery measures.
- Legislative discussions on infrastructure and tax bills are ongoing that would include major investments and tax incentives for hydrogen infrastructure and zero emissions vehicles and could potentially be considered for an eventual stimulus package.

- A recent Transportation / Infrastructure package introduced in the U.S. House of Representatives would authorize \$350M per year for five years for both electric and hydrogen infrastructure.
- There may be a negotiation process this autumn between on an infrastructure package. Furthermore, there may be stimulus policies that come quickly to address increased job losses and the economic downturn and could include more energy related provisions.

**CALIFORNIA**

- California passed their state budget on 22 June 2020, including small amounts of funding for hydrogen infrastructure.
- California Air Resource Board (CARB) to approve Advanced Clean Truck (ACT) rule with ZEV mandates for 2024 on Thursday, 25 June to promote H2 fuel cell truck adoption.
- Funding shortfalls from Cap and Trade revenue at the state level will greatly reduce capital available for purchase incentives and infrastructure investments for H2 and Fuel Cell technology.

**CANADA**

- Post COVID-19 economic stimulus packages have not been announced yet. However, the federal government is preparing a “significant” stimulus package which will include hydrogen measures.
- It is expected there will be a pool for stimulus funding with a heavy emphasis on clean technologies. How it will be allocated is not clear yet. Similarly, provinces are also developing plans.
- In parallel, the federal government is developing a Hydrogen Strategy for Canada due to be published in Q3 2020. The government is also continuing work during the COVID-19 crisis to enact a Clean Fuel Standard, coming into effect in 2023 that will lower the carbon intensity of fuels.
- Infrastructure Canada has been mandated to support the purchase of 5,000 ZEV buses for transit by 2025 – including FCEB.