

# Mission Innovation “Renewable and Clean Hydrogen Challenge”

## HyENet Workshop

Brussels, 18 November 2019

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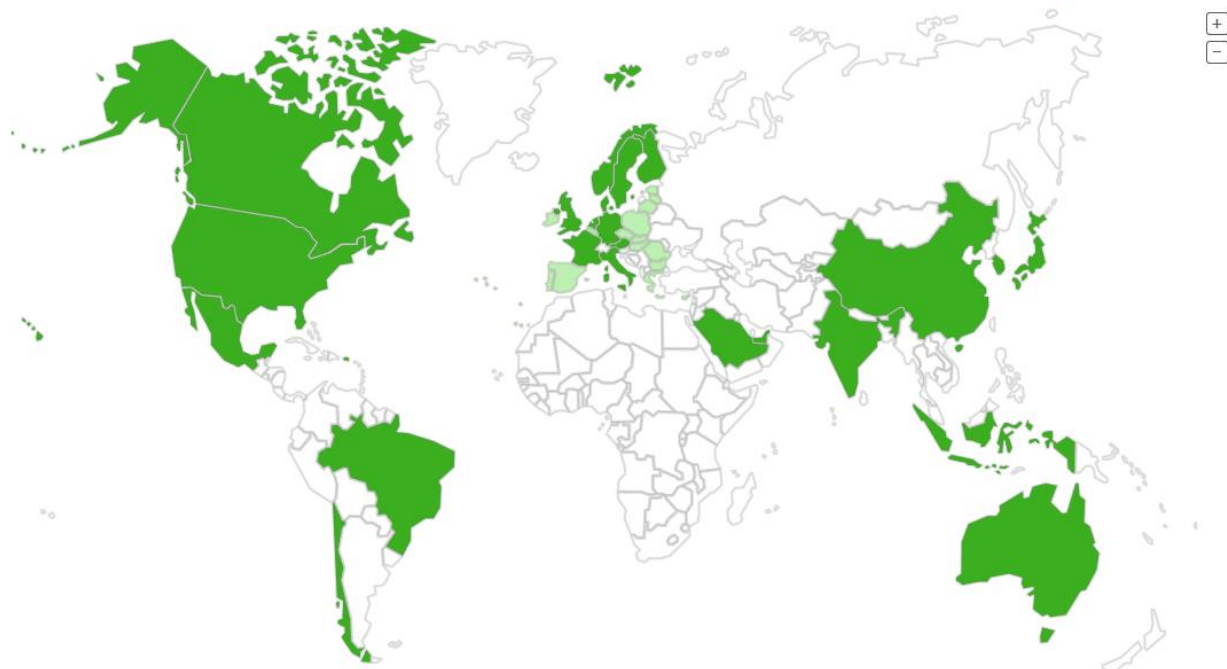
European Commission



**MISSION  
INNOVATION**

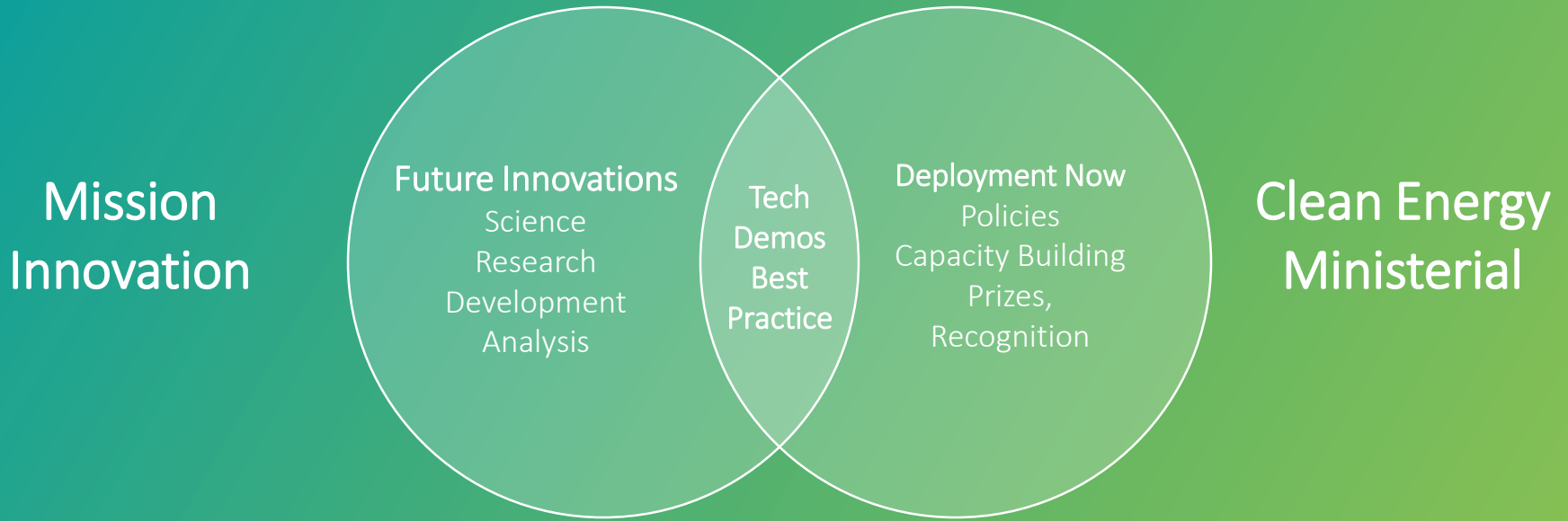
accelerating the clean energy revolution

# The Answer: Mission Innovation



- formed in 2015 to accelerate clean energy transition
- 23 countries + EU
- doubling R&I investment in clean energy by 2021
- facilitating greater private sector engagement in clean energy

# Mission Innovation ≠ Mission Regulation



# 8 Innovation Challenges

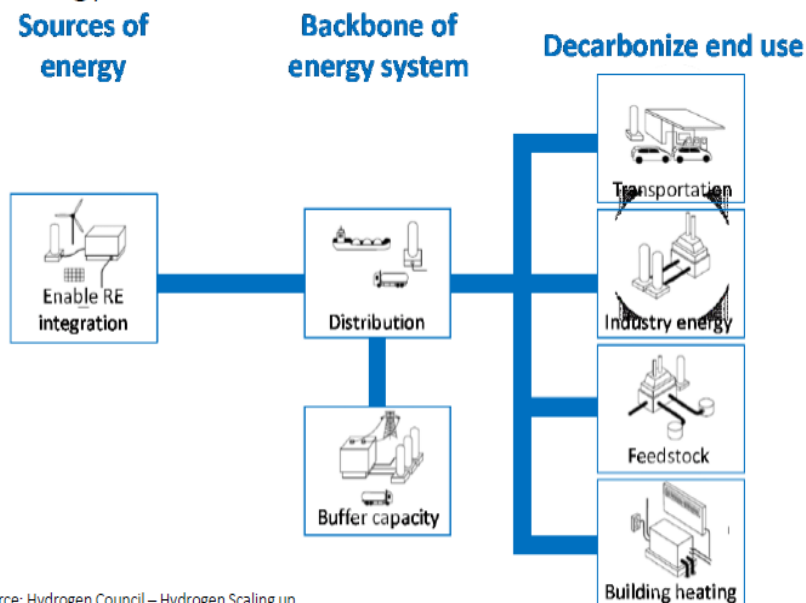
#1 Smart Grids	#2 Off Grid Access to Electricity	#3 Carbon Capture, Utilization, and Storage	#4 Sustainable Biofuels	#5 Converting Sunlight	#6 Clean Energy Materials	#7 Affordable Heating and Cooling of Buildings	<b>new</b> #8 Hydrogen
<p><b>Objective</b> Enable future grids powered by affordable, reliable, decentralised renewable electricity systems.</p> <p><b>Co-leads</b> CHINA INDIA ITALY</p>	<p><b>Objective</b> Develop systems that enable off-grid households and communities to access affordable, reliable renewable electricity.</p> <p><b>Co-leads</b> FRANCE INDIA</p>	<p><b>Objective</b> Enable near zero CO<sub>2</sub> emissions from power plants and carbon-intensive industries.</p> <p><b>Co-leads</b> SAUDI ARABIA MEXICO UNITED KINGDOM</p>	<p><b>Objective</b> Develop ways to produce at-scale widely affordable, advanced biofuels for transportation and industrial applications.</p> <p><b>Co-leads</b> BRAZIL CANADA CHINA INDIA</p>	<p><b>Objective</b> Discover affordable ways to convert sunlight into storable solar fuels.</p> <p><b>Co-leads</b> EUROPEAN COMMISSION GERMANY</p>	<p><b>Objective</b> Accelerate the exploration, discovery and use of new high-performance, low-cost clean energy materials.</p> <p><b>Co-leads</b> CANADA MEXICO</p>	<p><b>Objective</b> Make low-carbon heating and cooling affordable for everyone.</p> <p><b>Co-leads</b> EUROPEAN COMMISSION UNITED ARAB EMIRATES UNITED KINGDOM</p>	<p><b>Objective</b> Accelerate the development of a global hydrogen market by identifying and overcoming key technology barriers to the production, distribution, storage, and use of hydrogen at gigawatt scale.</p> <p><b>Co-leads</b> AUSTRALIA GERMANY EUROPEAN COMMISSION</p>
Top Accomplishments in 2017							
<ul style="list-style-type: none"> <li>India &amp; Australia launched <b>calls for proposals</b> in June to support effective collaboration among IC1 members.</li> <li><b>Collaboration agreements</b> (India, US, UK, Italy) were announced on Nov. 16-18.</li> <li>14 members contributed to the publication of the <b>2017 Country Report</b>.</li> </ul>	<ul style="list-style-type: none"> <li>India &amp; France launched <b>calls for proposals</b> in June/July and each selected 9 winning projects. Winners of the French competition focused on access to energy in African countries while winners of the Indian competition partnered with at least one MI country.</li> </ul>	<ul style="list-style-type: none"> <li>A <b>CCUS experts workshop</b> was held in Houston with 257 academic and industry participants from 22 countries and across 13 panels to establish the current state of CCUS technology.</li> <li>The <b>workshop report</b> will serve as an important signpost for future R&amp;D activities in carbon capture, utilization, and storage technologies.</li> </ul>	<ul style="list-style-type: none"> <li>Launched <b>survey</b> in partnership with Biofutures Platform and IEA to better understand the landscape of biofuels technology and identify research gaps, priorities, and collaboration activities.</li> <li>India launched a <b>funding call</b> worth USD \$5 million, which can be replicated in other MI countries.</li> </ul>	<ul style="list-style-type: none"> <li>The EC launched an <b>inducement prize</b> called "Fuel from the Sun" to produce useful fuels using artificial photosynthesis.</li> </ul>	<ul style="list-style-type: none"> <li>Mexico hosted the <b>inaugural workshop</b> in September, which catalyzed subsequent workshops hosted by Canada and laid the foundations for a <b>collaborative research project</b> to accelerate the discovery of clean energy materials.</li> </ul>	<ul style="list-style-type: none"> <li>An <b>Extreme Efficiency Cooling Prize</b> is being developed in conjunction with the Rocky Mountain Institute.</li> <li>A <b>collaborative research project</b> with the IEA is underway to develop an integrated heating, cooling, and power system for buildings.</li> </ul>	<p><b>Current Status</b></p> <ul style="list-style-type: none"> <li>Launched at the third Mission Innovation Ministerial in May 2018.</li> <li>A <b>deep-dive workshop</b> is planned for October 2018.</li> </ul>

Renewable and Clean Hydrogen Challenge (IC#8)  
launched at MI-3 (Malmö, 23-24 May 2018)

# Renewable and Clean Hydrogen Challenge (IC#8)

## The approach

Recognizes hydrogen as a key technology for the energy transition



Source: Hydrogen Council – Hydrogen Scaling up



## The objective

to accelerate the development of a global hydrogen market by identifying and overcoming key technology barriers to the production, distribution, storage and use of hydrogen at gigawatt scale:

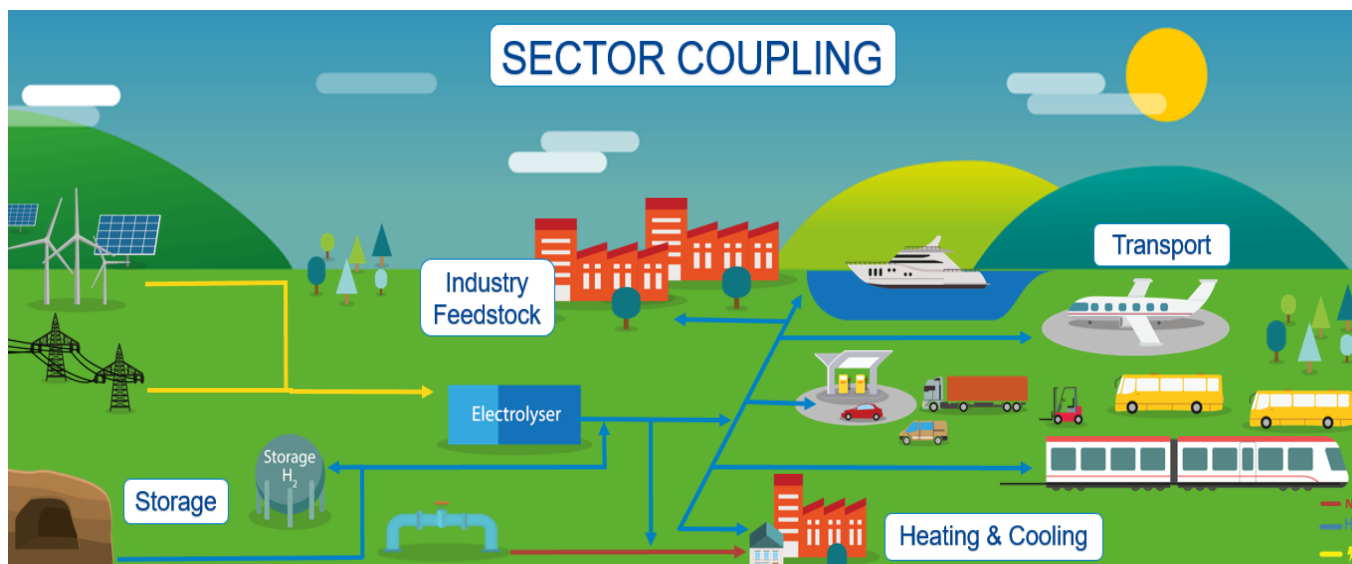
- initiate R&D
- enable large scale projects
- information sharing platform

# IC#8: Where are we? (1)

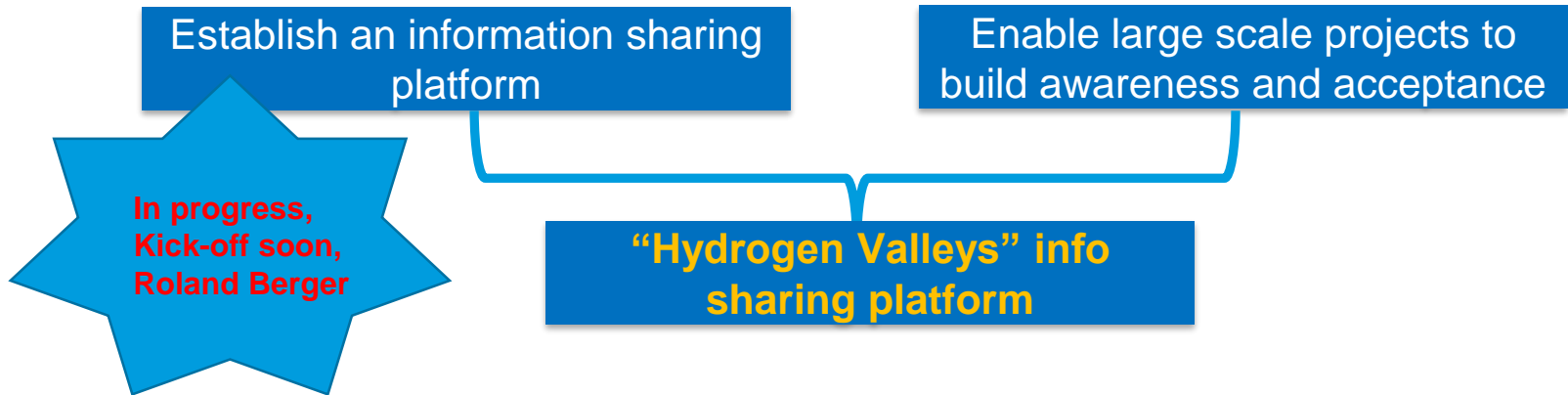


# “Hydrogen Valleys”:

A “**Hydrogen Valley**” can be defined as a geographical area - city, region, island or industrial site - where **several hydrogen applications** are combined together into an **integrated hydrogen eco-system** that consumes a significant amount of hydrogen. A Hydrogen Valley should ideally cover the entire hydrogen value chain (production, storage, distribution and final use).



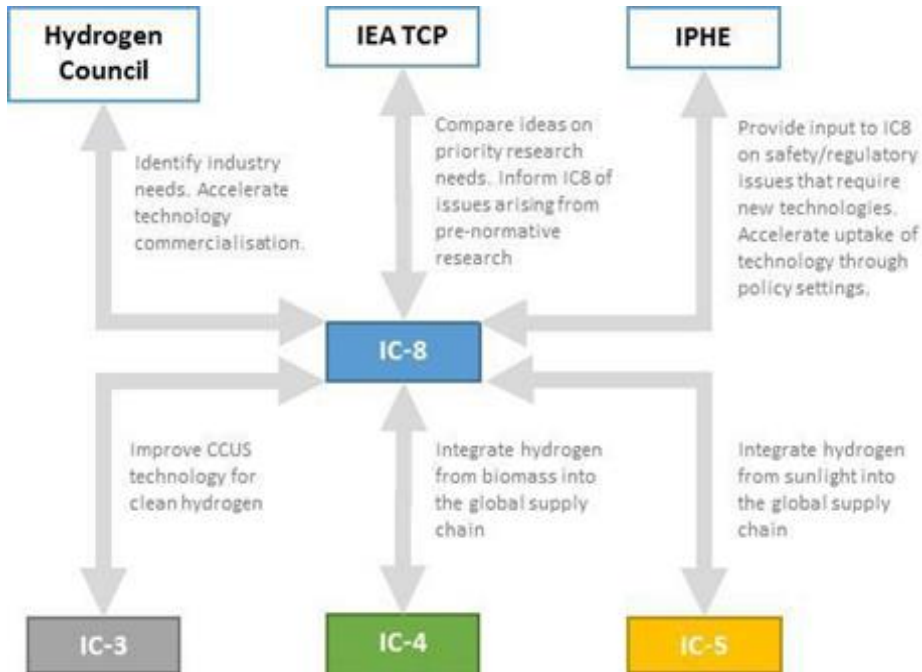
# “Hydrogen Valleys”:



- Many demonstration projects have successfully shown the maturity and benefits of individual hydrogen technologies (typically either in isolation or in limited size)
- The viability of hydrogen as a **systemic solution** has not yet been showcased at scale
- The objective of IC#8 information sharing platform is to consolidate the learnings of the first emerging “H2 Valley” projects from MI members in order to accelerate the shift towards large-scale multi-application hydrogen projects



# It is all about collaboration and coordination!



Mission Innovation IC#8 can provide a platform for coordination of stakeholders efforts' and for a high-level public-private dialogue.

Taking place back-to-back with Clean Energy Ministerial it is ideally placed to increase the awareness regarding the potential impact of hydrogen in the context of global CO2-reduction targets.

