



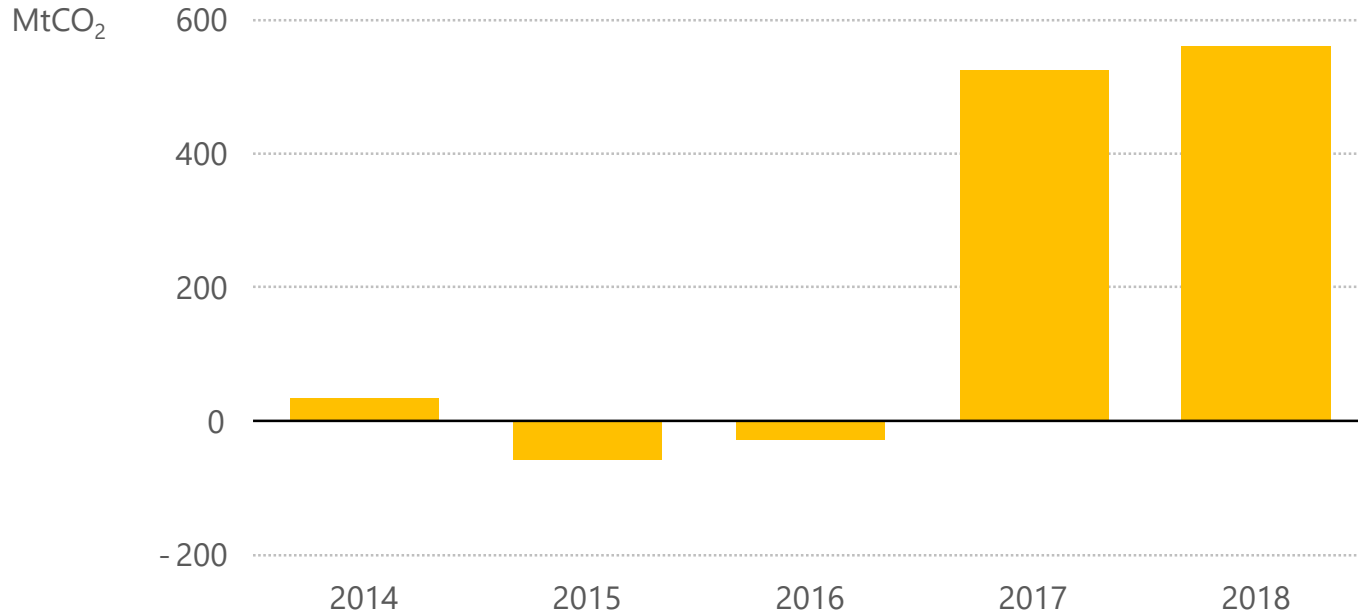
Hydrogen for energy policy

Simon Bennett, Co-lead, IEA hydrogen projects

MI Hydrogen Valleys workshop, Antwerpen, 26 February 2019

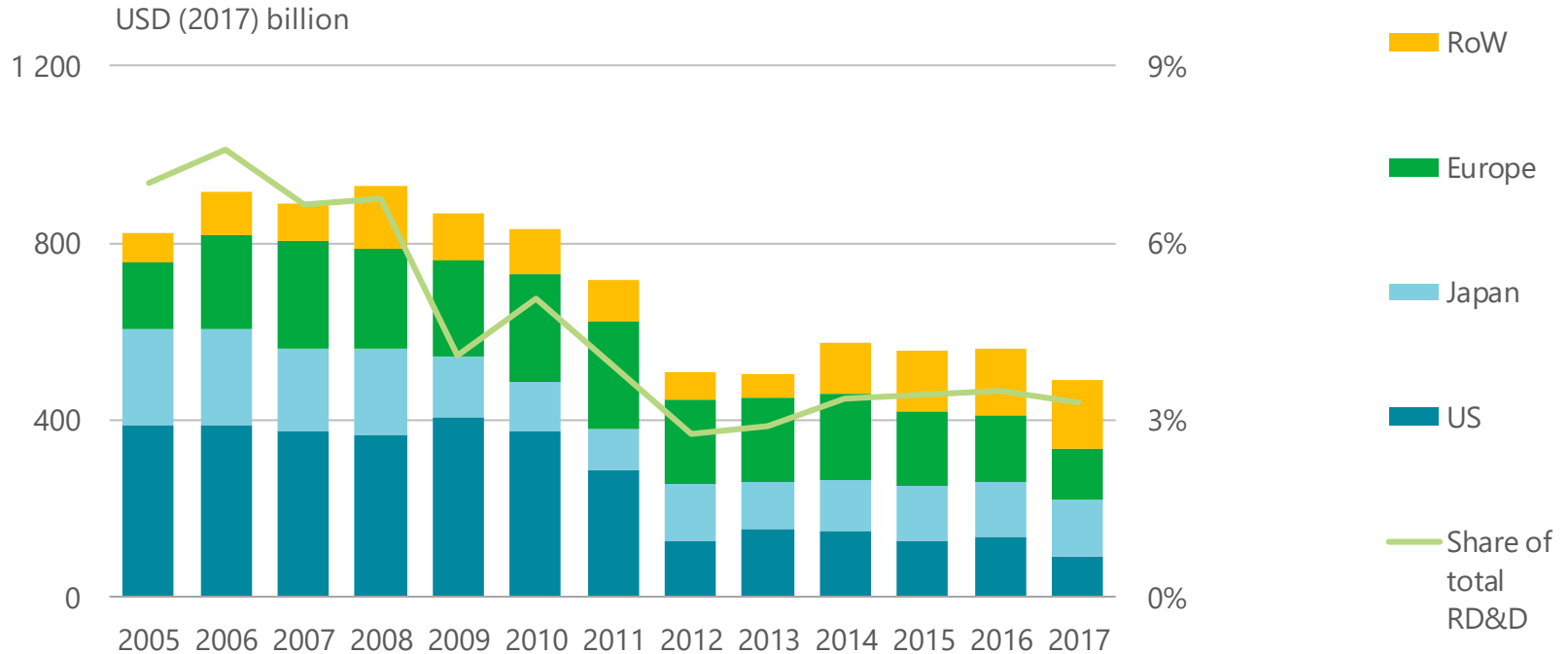


Annual change in global energy-related CO₂ emissions, 2014-2018



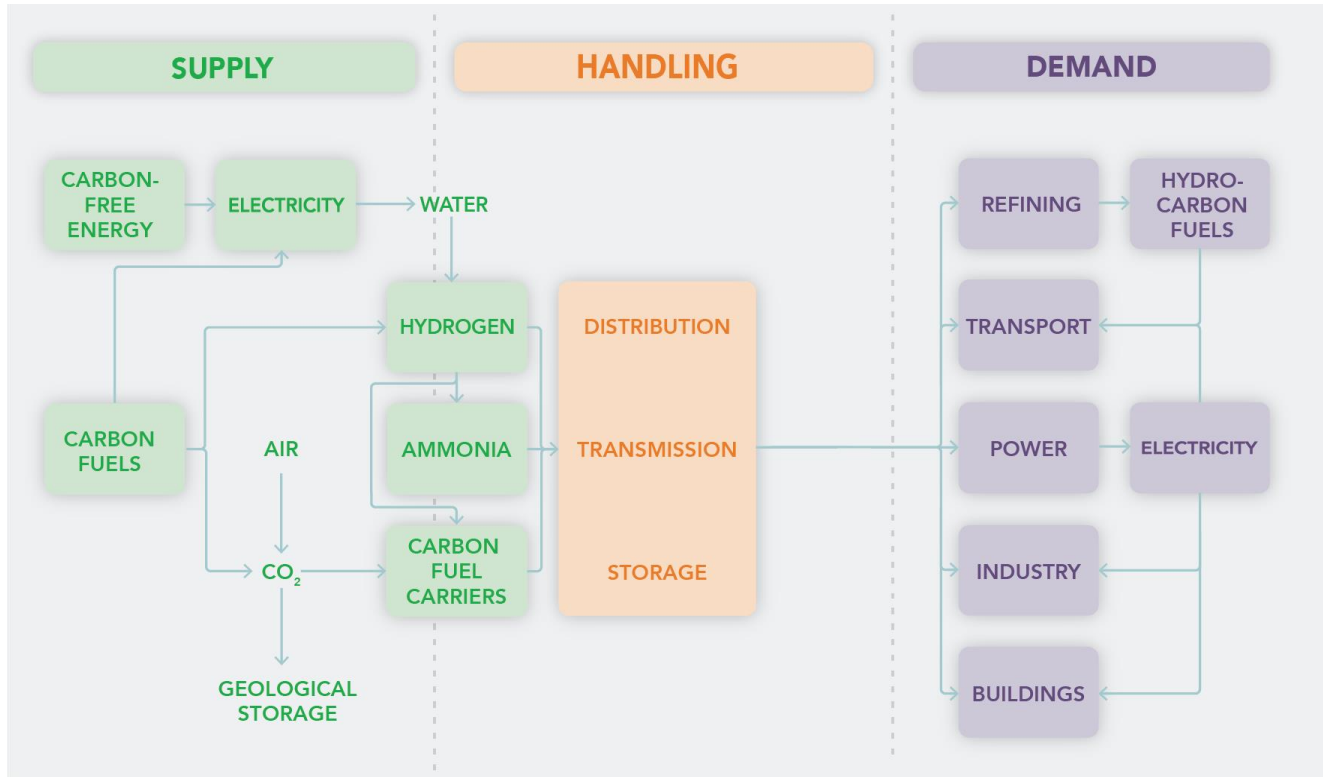
Higher demand for fossil fuels drove up global CO₂ emissions for a second year after a brief hiatus. Increases in efficiency, renewables, coal-to-gas switching and nuclear avoided 640 Mt of CO₂ emissions.

RD&D budget tracking



IEA tracks government RD&D budgets and supports Mission Innovation efforts. Data shows no significant uptick in spending on hydrogen. (Does not include EC €140M in 2017)

Hydrogen has many production sources and applications



Hydrogen can be produced from different sources & has multiple applications, including in transport, industry, buildings and power generation; when produced from fossil fuels, coupling with CCUS maximises CO₂ benefits

“All of IEA” effort on hydrogen in 2019



Reports / new hydrogen web portal



Technology Network



Convening Power / Business Network

Energy Business Council



Events



Joint workshop by the International Energy Agency and the European Commission

Electrofuels

Date: Monday 10 September 2018

Secretariat



IEA has been active on the analysis of hydrogen for many years; our work is expanding further, collaborating closely with our extensive technology and business networks

Mr. Noe van Hulst (Chair)	Hydrogen Envoy, Ministry of Economic Affairs & Climate Policy, Netherlands; former Chair of the IEA Governing Board
The Honourable Elisabeth Köstinger	Minister of Sustainability and Tourism, Austria
Mr. Ahmad O. Al-Khowaiter	Chief Technology Officer, Saudi Aramco
Dr. Alan Finkel	Australia's Chief Scientist, Office of the Chief Scientist
Mr. Mikio Kizaki	Chief Professional Engineer, Toyota Motor Corporation, Japan
Dr. Rebecca Maserumule	Chief Director of Hydrogen and Energy, Dept. of Science and Tech., South Africa
Dr. Ajay Mathur	Director General, TERI (The Energy and Resources Institute), India
Mr. Dominique Ristori	Director General Energy, European Commission
Dr. Sunita Satyapal	Director Fuel Cell Technologies Office, US Department of Energy, United States
Dr. Adnan Shihab-Eldin	Director General of the Kuwait Foundation for the Advancement of Sciences; former Secretary-General of OPEC, Kuwait

- Workshop brought together over 140 top experts and stakeholders:
 - From governments (40% of participants); industry (40%); and research/academia (20%)
 - 28 total countries plus EC:
 - 24 of 38 from IEA Family
 - 14 of G20 countries
 - Diverse companies (oil and gas, renewables, chemical, iron/steel, utilities, car, rail, etc.)
 - Chairs of 2 Technology Collaboration Programmes; representatives of CERT
- Workshop focussed on four sessions (which mirror IEA report):
 - The cases for hydrogen – motivations for an increasing focus on hydrogen
 - Expanding markets for hydrogen – near-term priorities
 - From early markets to...where? – Views on long-term potential for hydrogen
 - Getting the ball rolling – needed policies and next steps to scale up

“Hydrogen can be the ‘system glue’ that allows decarbonisation”

“Each of the key actors in hydrogen are touching one part of the elephant but not the whole”

“There are major opportunities that can only be realised by different sectors and actors working together to identify synergies”

“Will governments be able to set frameworks that enable cross-sectoral synergies to emerge?”

“The key role for governments will be to take on some of the risk of building the infrastructure, such as pipelines and fuelling stations.”

“Governments have a big role to play in harmonising standards and regulations across borders”

“The transition from today’s scale to a major industry requires governments and industry to collaborate in public-private partnerships that pick winners, like Airbus...”

“There are benefits to re-using existing assets, such as gas networks...but only around 1% hydrogen can be added (in energy terms) without investments in equipment upgrades.”

“Is hydrogen the boy who cried wolf....or is there something different this time around?”

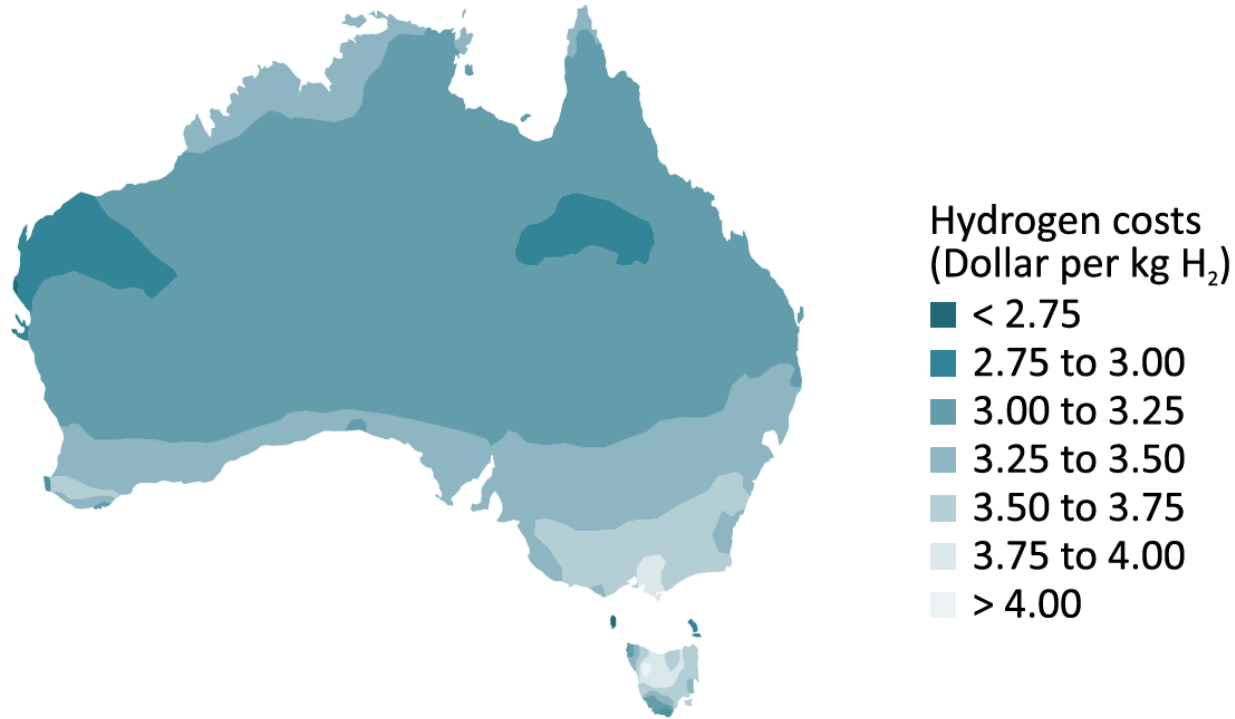
“Grey and blue hydrogen can be a stepping stone to green hydrogen
....CCUS and hydrogen can be a very powerful combination”

“Green hydrogen is available today”

“Near-term opportunities can build on existing clusters of hydrogen demand in industrial areas (US Gulf Coast and Netherlands) and vehicle refuelling for forklifts and freight”

“Hydrogen is a unifying theme among energy stakeholders”

“We would like IEA to identify pathways to scale”



Renewables costs, a broader set of policy objectives, more focus on hard-to-abate sectors, industrial policy and a stronger stakeholder alliance count in hydrogen's favour

- There are numerous sources for producing hydrogen and numerous applications, but technical & cost challenges still remain
- Government and industry commitments are crucial to facilitating and scaling-up investment in hydrogen
- There is a need to raise awareness, remove roadblocks and identify near-term markets for hydrogen for its long-term deployment
- The IEA is ready to support governments and industry, with data, analysis, an "All-Fuels-And-All-Technologies" approach & real-world solutions



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