Accelerating a Sustainable Recovery

Hydrogen Technologies

Make Every Molecule Matter
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Today’s agenda

01 Accelerating a Sustainable Recovery: Hydrogen Technologies
   ▪ Implications of COVID-19 for the hydrogen economy
   ▪ H₂: Rapidly-growing government support
   ▪ Hydrogen production technologies now
   ▪ Hydrogen in the future energy system

02 Hydrogen Sustainable Recovery Panel

03 Live Q&A with Our Panelists
Host

Nick Flinn
GM Decarbonisation
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Panelists

Andy Gosse
President
Shell Catalysts & Technologies

Paul Bogers
VP Hydrogen
Shell

Yunji Xu
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Implications of COVID-19 for the hydrogen economy

- Increased emphasis on cash preservation
- Disrupted R&D operations
- Impacted global supply chains
- Influenced adoption of hydrogen incentives by some governments

Shell sees great potential for the use of hydrogen in a range of sectors, from transport to industry. As governments, businesses and energy consumers continue to align on the need for net-zero emissions in the future, support for hydrogen is gathering pace.

Learn more: [Shell’s hydrogen mission on Shell.com](https://www.shell.com)
H₂: Rapidly-growing government support

**Challenge:** To support cost reduction and the matching of hydrogen supply with demand, immediate supportive policy is needed to enable investment.

**Germany**
- 5 GW by 2030
- €9 billion hydrogen stimulus

**Japan**
- 2017: Basic Hydrogen Strategy
- 2019: Renewed Strategic Roadmap for H₂ and Fuel Cells
- Target: 800,000 FCEVs by 2030

**Chile**
- Long-term Green Hydrogen Strategy
- 5 GW by 2025

**Australia**
- National Hydrogen Strategy (2019)
- 57 actions with AUD 370 million funding package

**Canada**
- 2050 Target: 30% of energy
- C$1.5 billion low-carbon fuel fund
Hydrogen production technologies now

01. ACCELERATING A SUSTAINABLE RECOVERY: HYDROGEN TECHNOLOGIES

Primary Energy Source → Conversion → Final Energy Carrier

- **Biogas or Biomethane**
- **Natural Gas**
- **Solar or Wind are used to produce electricity**

**Thermochemical Conversion**
Steam methane reform (SMR), when using natural gas or biogas, produces a reaction between methane and steam, forming a synthetic gas that consists predominantly of hydrogen.

**Electrolysis**
Through a process called electrolysis, electricity is used to split water.

Either of these processes produce hydrogen.
Hydrogen in the future energy system

Enable deep renewables penetration, distribution and system resilience

- Enabling large-scale renewables penetration and power generation
- Distribute energy across sectors and regions
- Act as a buffer or storage to increase system resilience
  Electrolysers as real-time sinks for an oversupplied renewable system

Decarbonise hard-to-abate end-uses

- Decarbonising transportation leveraging higher energy density uses
- Decarbonising industry energy use replacing coal and other fossil fuels
- Decarbonising building heat and power leveraging existing gas infrastructure
- Decarbonising grey H₂ use in fertiliser, refineries and chemical industries
Hydrogen Sustainable Recovery Panel
Live Q&A With our Panelists
Thank you for attending!

Accelerating a Sustainable Recovery: Hydrogen Technologies

Get involved by exploring the Make Every Molecule Matter initiative:
Explore Now →

Get connected with blue hydrogen experts:
Get Connected →