



# An International Update on CCUS from IEAGHG

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General Manager IEAGHG

DOE-NETL 2021 Carbon Storage Project Review Meeting

4 August 2020



## Who are we?

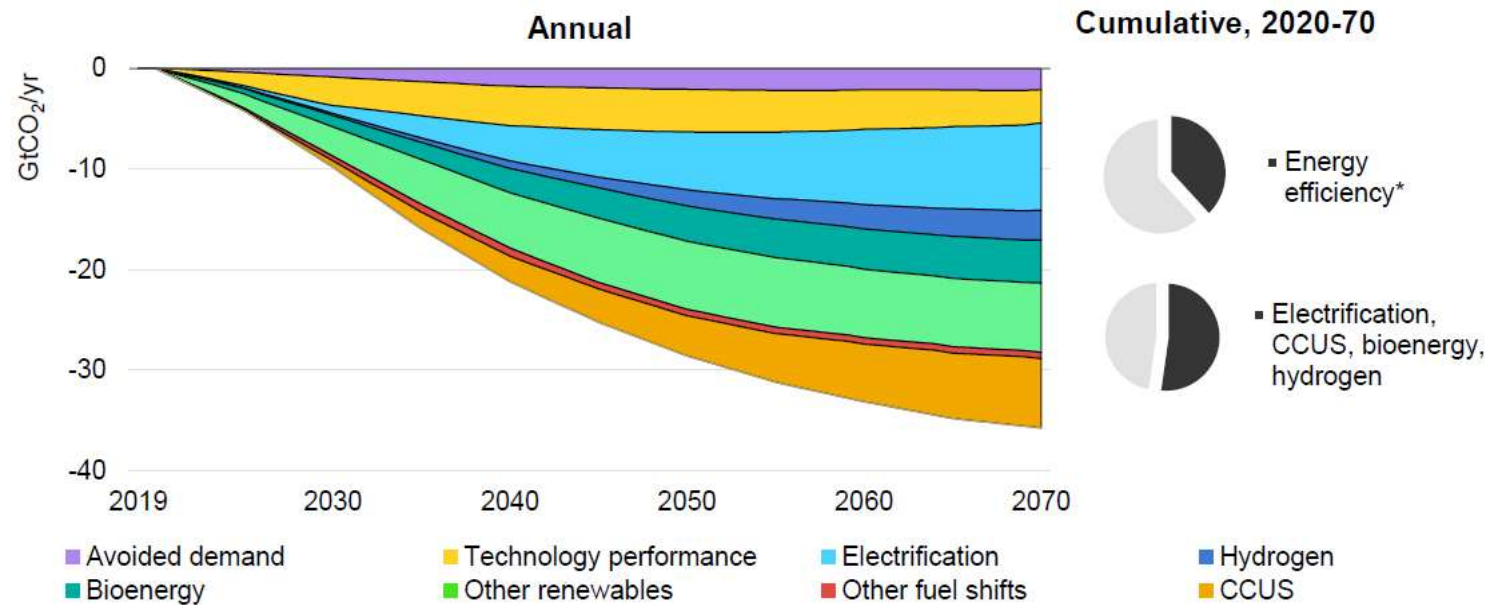
Our internationally recognised name is the IEA Greenhouse Gas R&D Programme (IEAGHG). We are a Technology Collaboration Programme (TCP) and are a part of the International Energy Agency's (IEA's) Energy Technology Network.

## Disclaimer

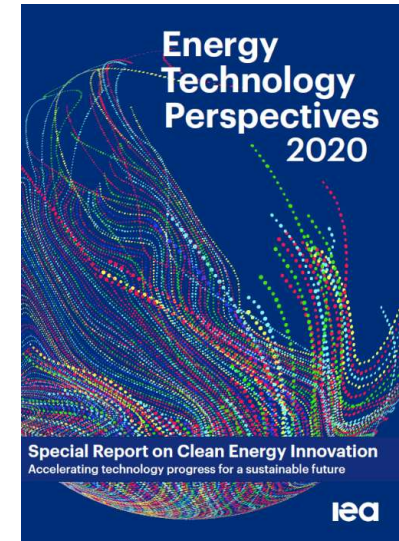
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# IEA ETP2020

Figure 2.2 Global energy sector CO<sub>2</sub> emissions reductions by measure in the Sustainable Development Scenario relative to the Stated Policies Scenario, 2019-70



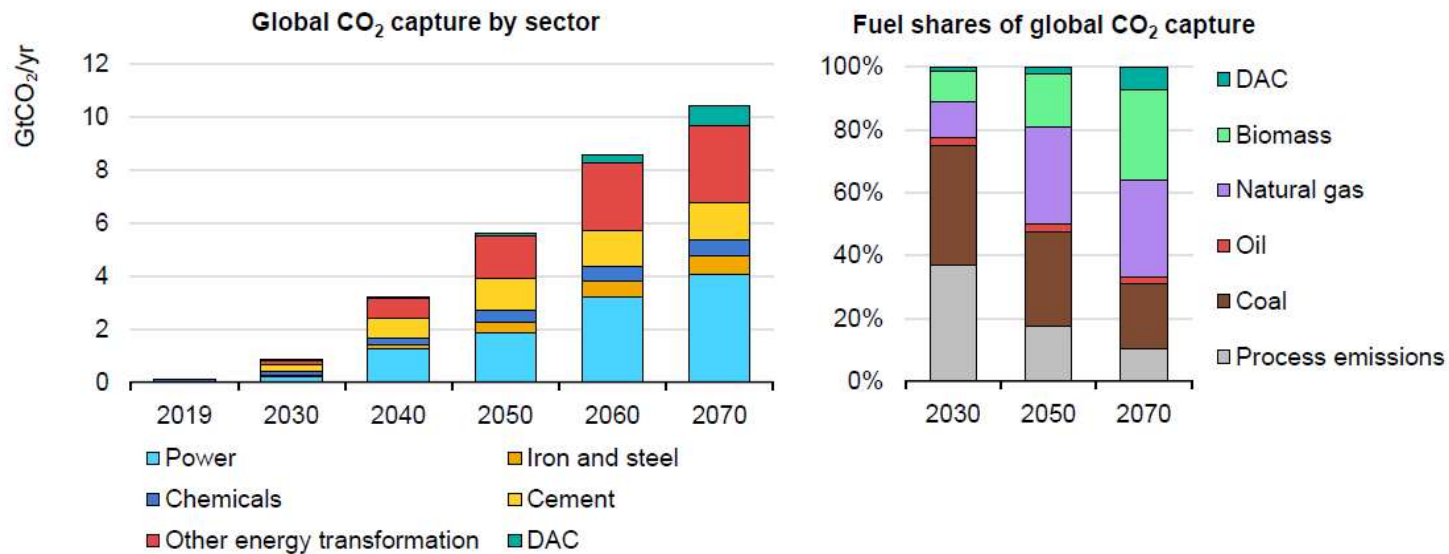
IEA 2020. All rights reserved



- CCUS role is 15% in Sustainable Development Scenario (net zero by 2070)
- CCUS role is 25% in Faster Innovation Case (net zero by 2050)

# IEA ETP2020

Figure 2.12 Growth in global CO<sub>2</sub> capture by sector and fuel in the Sustainable Development Scenario, 2019-70

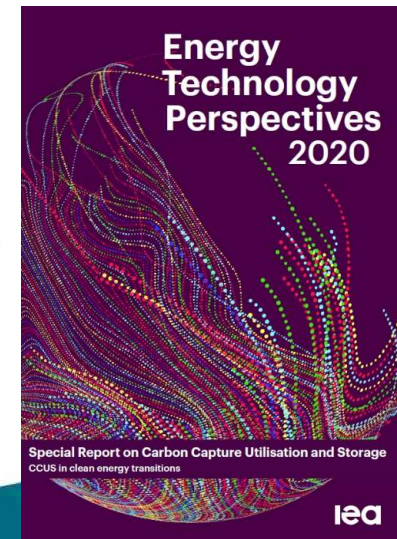
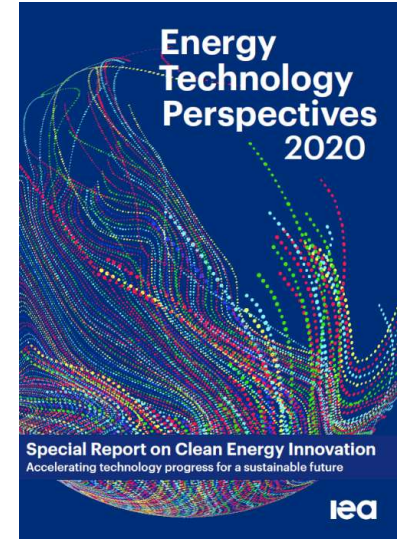


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## IEA SR CCUS

- Tackling emissions from existing energy assets;
- A solution for the most challenging emissions in sectors such as heavy industry & aviation;
- A platform for low-carbon hydrogen production;
- Removing carbon from the atmosphere

(IEA SR on CCUS 2020)



# IEA Net Zero by 2050 Roadmap

**Figure 4.1** ▶ Selected global milestones for policies, infrastructure and technology deployment in the NZE

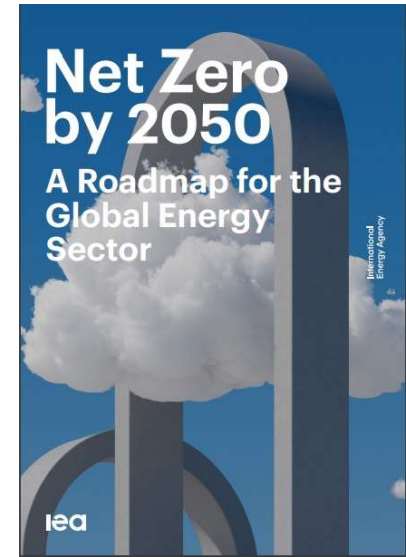
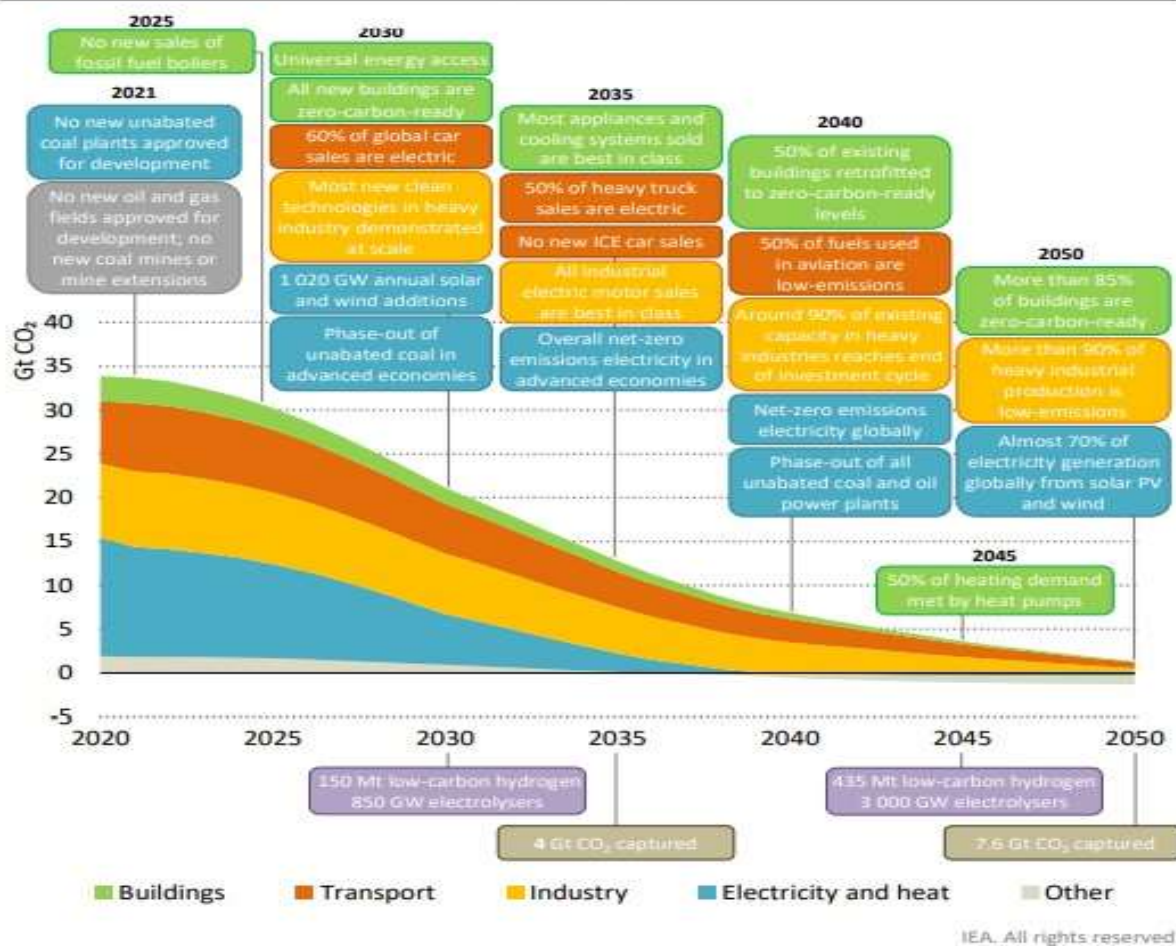
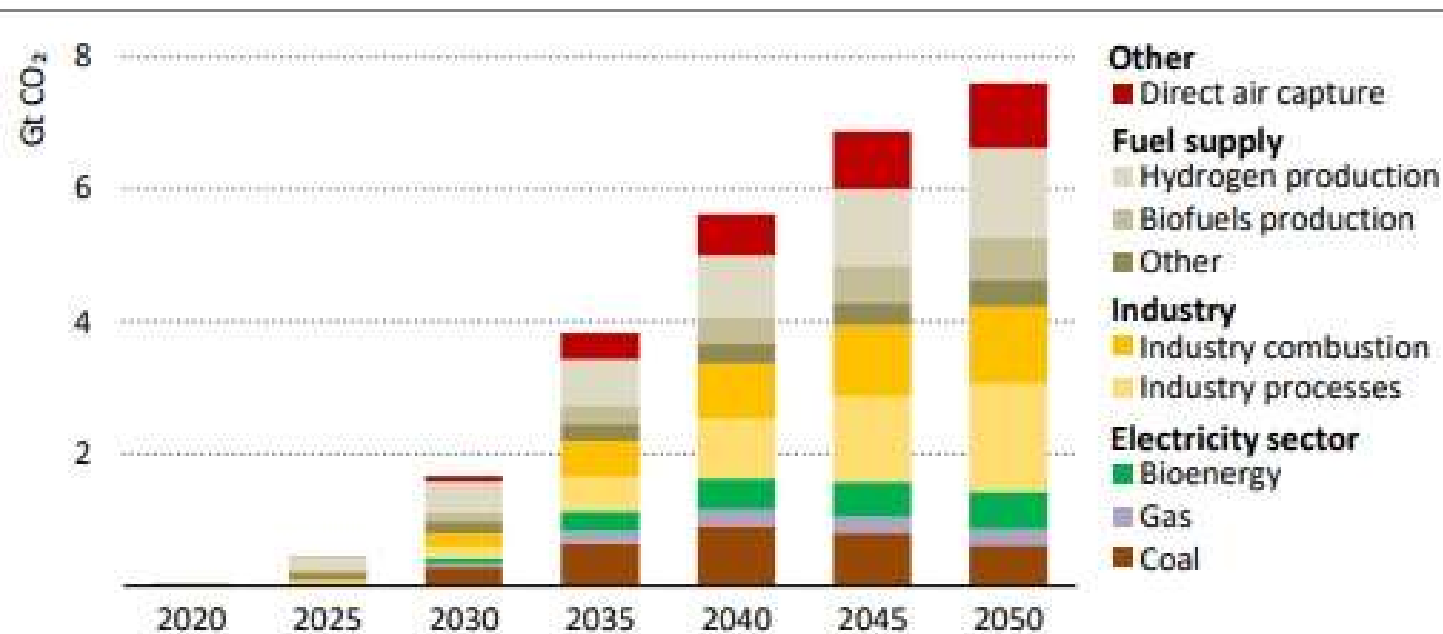


Fig 4.1. IEA NZE 2021

# IEA Net Zero by 2050 - role of CCS



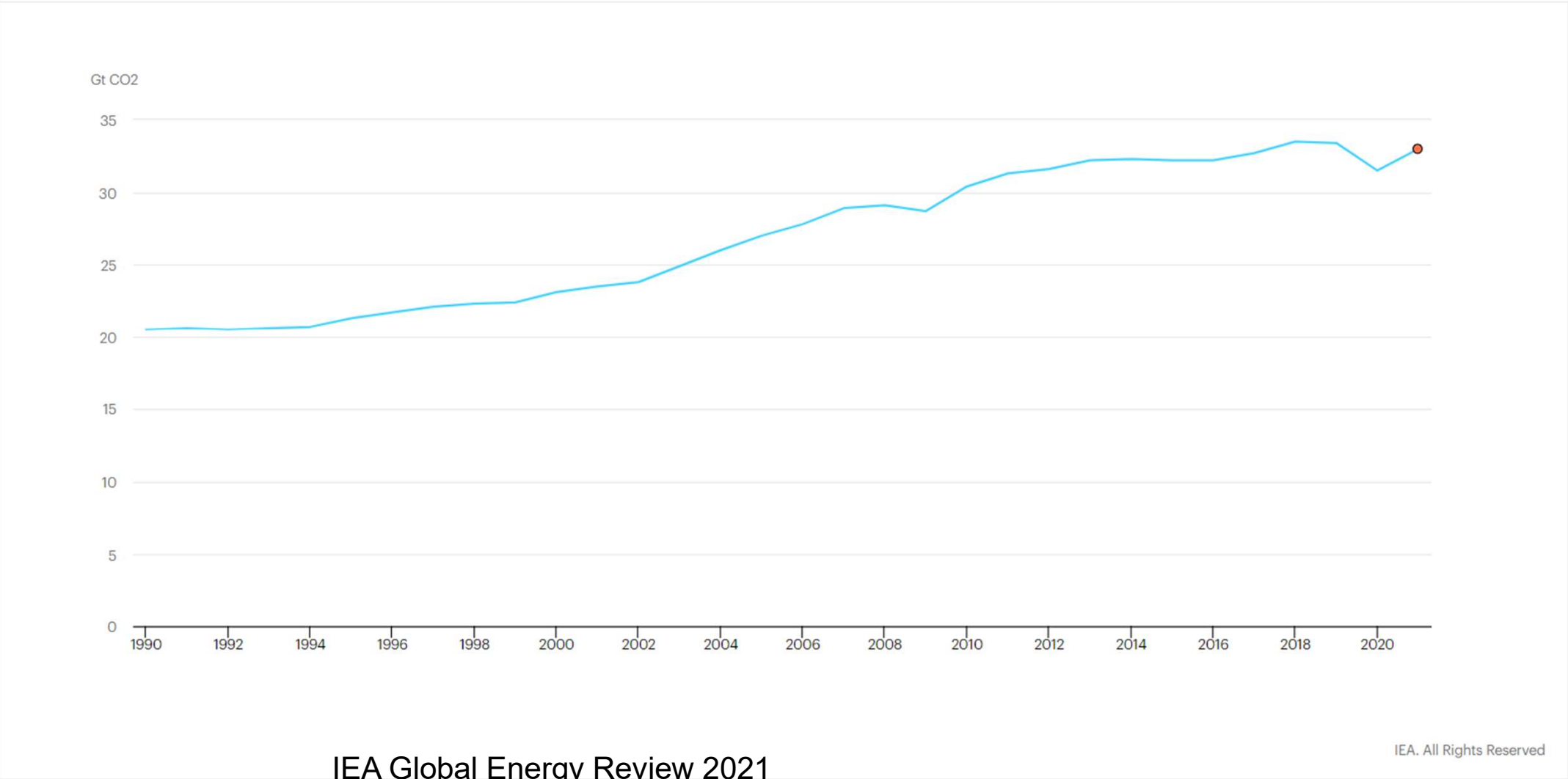
**Figure 2.21** ▶ Global CO<sub>2</sub> capture by source in the NZE



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Fig 2.21 IEA NZE 2021

# Global energy-related CO2 emissions, 1990-2021



# Global Climate Policy – increased momentum in 2021



- COVID impact and economic stimuli
- Net Zero Pledges including:
  - 2045 - Germany
  - 2050 – EU, UK, USA, Japan, Canada, Korea, South Africa
  - 2060 – China, Brazil, Indonesia
  - Multinationals – including Shell, Eni
- 2021 G7 – ‘Net Zero G7’, “Build Back Better”



- **UNFCCC**
- **Paris Agreement 2015**

- *"Well below 2C"*
- *"Pursue 1.5C"*
- *Net-zero - "in second half of century"*

- Nationally Determined Contributions - to be updated every 5 years, to *"represent a progression"*, first update in 2020 for COP26

- COP26, 31 Oct -12 Nov, Glasgow, UK



# UNFCCC Paris Agreement



## Nationally Determined Contributions (NDCs)

- 187 submitted ahead of COP-21 - 10 included CCS as a mitigation activity.
- Should be noted that these NDCs are short-term focussed and only to 2025 or 2030. Have to be updated every 5 years and to represent advancement.
- NDC's had to be updated in 2020 – as of 6<sup>th</sup> January 2021 **48** were submitted (one covering EU), only **5** include CCS (Norway, UAE, Australia, also UK and EU implicitly) (see IEAGHG Information Paper 2021-IP05 by J. Lipponen and T. Dixon).
- Important for access to multilateral climate finance.

## Low GHG emission development strategies

- Longer-term, the Paris Agreement invited Parties to communicate '*long term low GHG emission development strategies*' to the mid-century.
- As of 4<sup>th</sup> August 2021, **31** countries have submitted these, and **25** contain CCS as a mitigation activity, particularly for industrial emissions (USA, Canada, Germany, Mexico, France, Czech Republic, UK, Ukraine, Japan, Portugal, Slovak Republic, Singapore, South Africa, Finland, Norway, Latvia, Belgium, Spain, Sweden, Netherlands, Austria, Korea, Denmark, Switzerland, Indonesia)
- **Most submissions include CCS**

# COP26, 31 Oct -12 Nov, Glasgow, UK



## UK Presidency Goals:

- Countries to come forward with more ambitious 2030 emissions reductions targets that align with reaching net zero by 2050
- Developed countries make good on their promise to mobilise at least \$100bn in climate finance per year
- Finalise Article 6
  - 6.2 - Cooperative Approaches using Internationally Transferrable Mitigation Outcomes (ITMOs) (between countries)
  - 6.4 - Mechanism to encourage GHG mitigation (project-based)
  - 6.8 – Non-market approaches

# Regulatory Developments



## Australia

- Emission Reduction Fund – new method for CCS to earn tradable credits

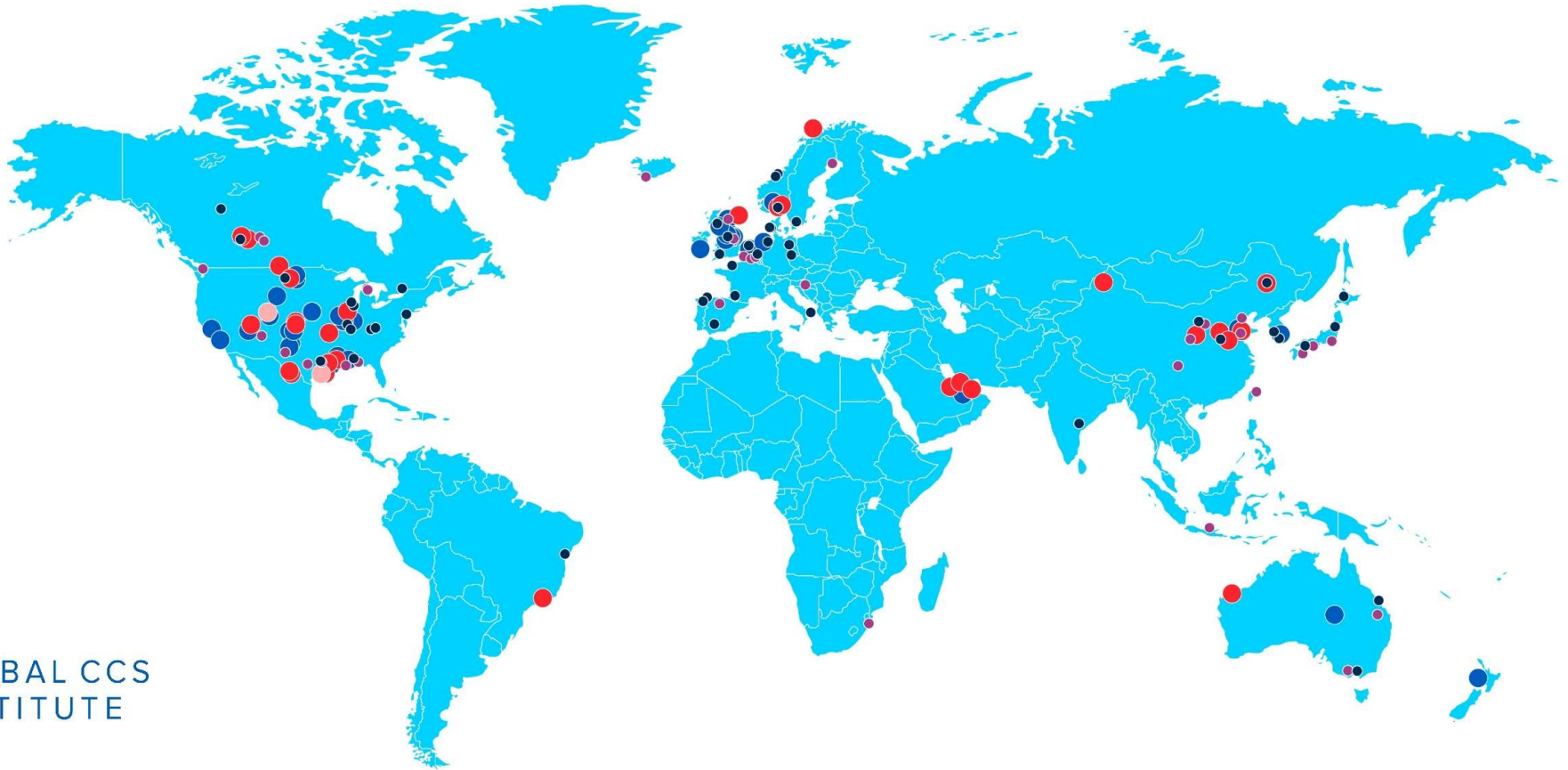
## Canada

- Federal carbon tax plan (C\$30 in 2020 to C\$170 in 2030)
- Clean Fuel Standard – proposed Quantification Method for CCS

# New Initiatives

- Asia CCUS Network



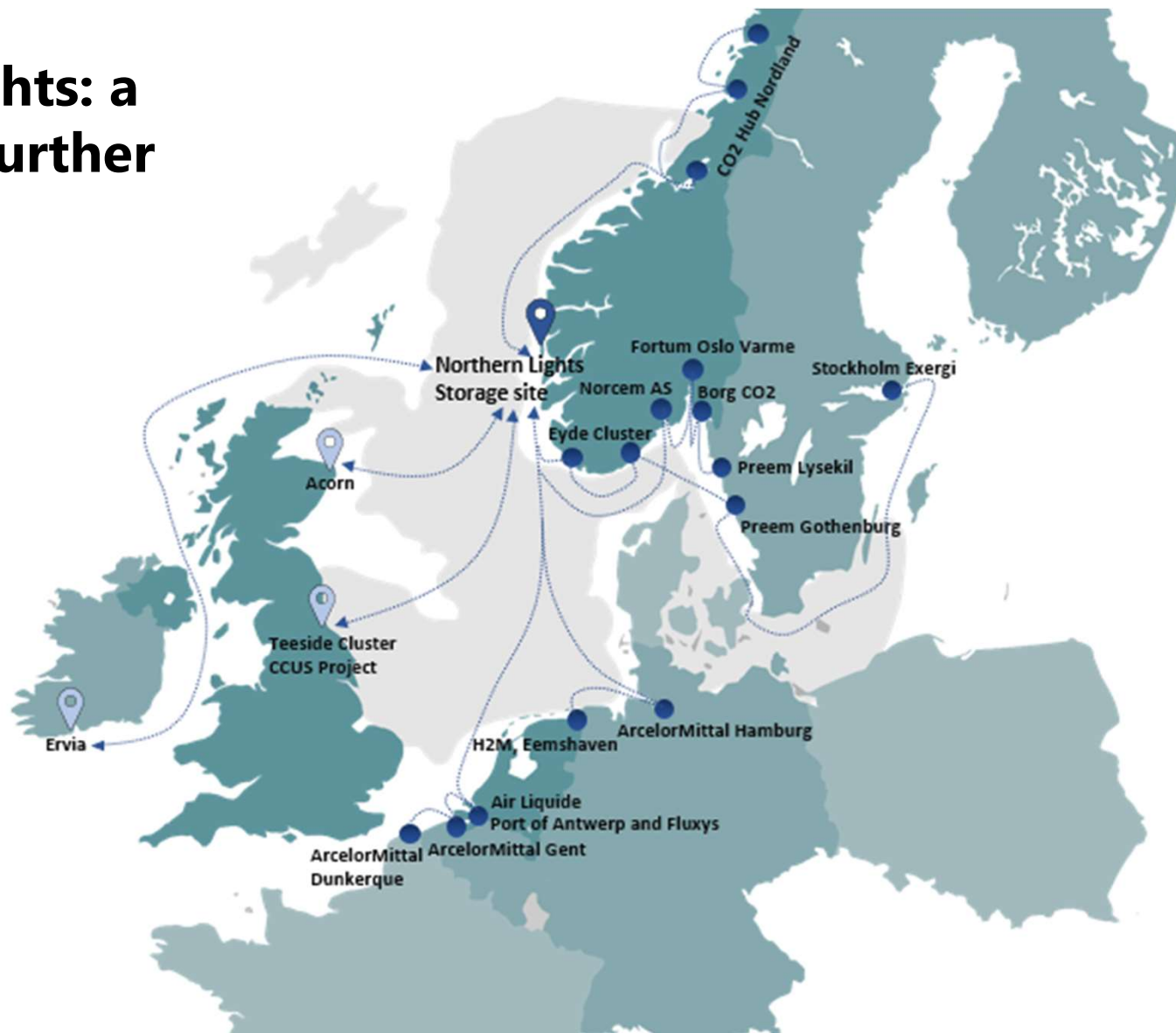


GLOBAL CCS  
INSTITUTE

2020

- COMMERCIAL CCS FACILITIES IN OPERATION & CONSTRUCTION
- COMMERCIAL CCS FACILITIES IN DEVELOPMENT
- OPERATION SUSPENDED
- PILOT & DEMONSTRATION FACILITIES IN OPERATION & DEVELOPMENT
- PILOT & DEMONSTRATION FACILITIES COMPLETED

# Northern Lights: a nucleus for further growth



Kilde: PCI-søknad fra Northern Lights (Equinor, Shell og Total)



## Hydrogen and CCUS

- Australia-Japan Hydrogen Energy Supply Chain
- Equinor H2H Saltend (UK)
- HyNet (UK)

## DACCS

- Northern Lights and ClimeWorks (Norway)
- Pale Blue Dot and Carbon Engineering (UK)
- Corporate Carbon Advisory (Australia)



# IEAGHG



- Flagship activities:
- **Technical Studies** >356 reports published on all aspects of CCS
- **International Expert Networks**
  - Risk Management - Meeting postponed from Jun 2020 to 2022
    - Webinar in Dec 2020
  - Monitoring - Webinars in Aug 2020, Jan 2021
  - Modelling
  - Environmental Research
  - High Temperature Solid Looping
  - Costs
- **GHGT conferences**
- **GHGT16 – 23-27 Oct 2022, Lyon France. Call for abstracts – Sep 2021**
- **PCCC conferences**
- **PCCC6, UKCCSRC, virtual, 19-21 Oct 2021**
- **Negative CO<sub>2</sub> Emissions conference – postponed**





Hosted by



## 15<sup>TH</sup> INTERNATIONAL VIRTUAL CONFERENCE ON GREENHOUSE GAS CONTROL TECHNOLOGIES

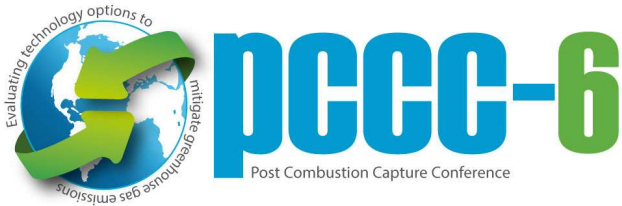
15 - 18 MARCH 2021

FULLY VIRTUAL  
EXPERIENCE

 [www.ghgt.info](http://www.ghgt.info)

- Fully virtual
- Over 500 presentations in 7 parallel sessions and posters
- 956 attendees from 41 countries
- Sponsors: TOTAL, OGCI, CCP, Equinor, Gassnova, Southern Company, MHI
- Papers published in SSRN (proceedings) and IJGGC
- GHGT-15 Summary report





**Fully Virtual**

# **IEAGHG 6<sup>th</sup> Post Combustion Capture Conference** **19-21 October 2021**

**15 technical sessions including keynotes & poster presentations:**  
**Applications, Cost Assessment, Demonstration Activities, Environmental Assessments, Process Modelling,**  
**Process Configuration, Separation technologies**

**Hosted by:**  **UKCCS** and  **ieaghg**  
RESEARCH CENTRE

**Sponsored by: Southern Company**    
NATIONAL CARBON CAPTURE CENTER

**Registration open: Early Bird rates until 31.8.2021 - £50 students; £150 Others**  
**-includes access to platform for 6 months post event.**

# International CCS Summer Schools



- 636 alumni, 58 countries
- 2020 in Bandung, Indonesia, hosted by ITB - **Postponed to 2022**
- CCS Virtual Course with ITB
- for ASEAN students – Nov 2020
- 82 students
- **CCS Virtual Course with ITB 2021**
- **26 Jul to 6 Aug 2021**





Input to WPFE and CCUS Unit



CSLF Technical Group  
GHG TCP inputs



CCUS Initiative  
GHG TCP inputs



London Convention:  
Regular updates on CCS:  
ROAD permit assessment, Offshore workshops  
CO<sub>2</sub> Export Resolution 2019 – Report 2021-TR02

# Knowledge Transfer



United Nations  
Framework Convention on  
Climate Change

CCS Side Events at COP22,  
COP23, COP24, COP25



Expert Reviewers,  
Accredited Observer  
1.5SR, AR6 reviews



ISO Technical Committee  
on CCS, TC-265  
4 ISO standards & 4 technical reports  
GHG TCP inputs





# ieaghg





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