

GLOBAL STATUS OF CCS 2021

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JAPAN-ASIA CCUS FORUM

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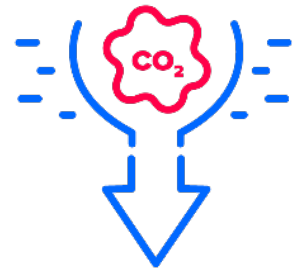
GLOBAL STATUS OF **CCS 2021**

CCS ACCELERATING TO NET ZERO

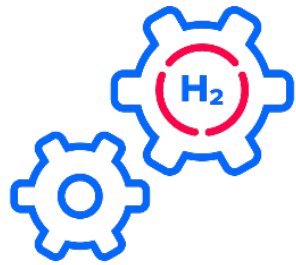


GLOBAL CCS
INSTITUTE

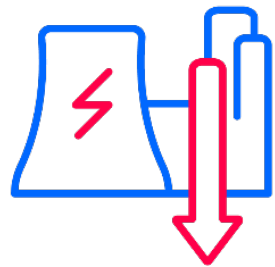
CCS: REACHING NET-ZERO AND DRIVING THE LOW-CARBON ECONOMY



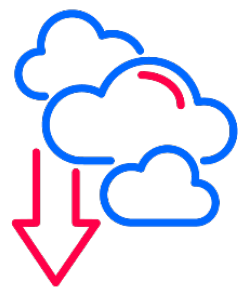
Achieving deep decarbonisation in hard-to-abate industry.



Enabling the production of low-carbon hydrogen at scale.



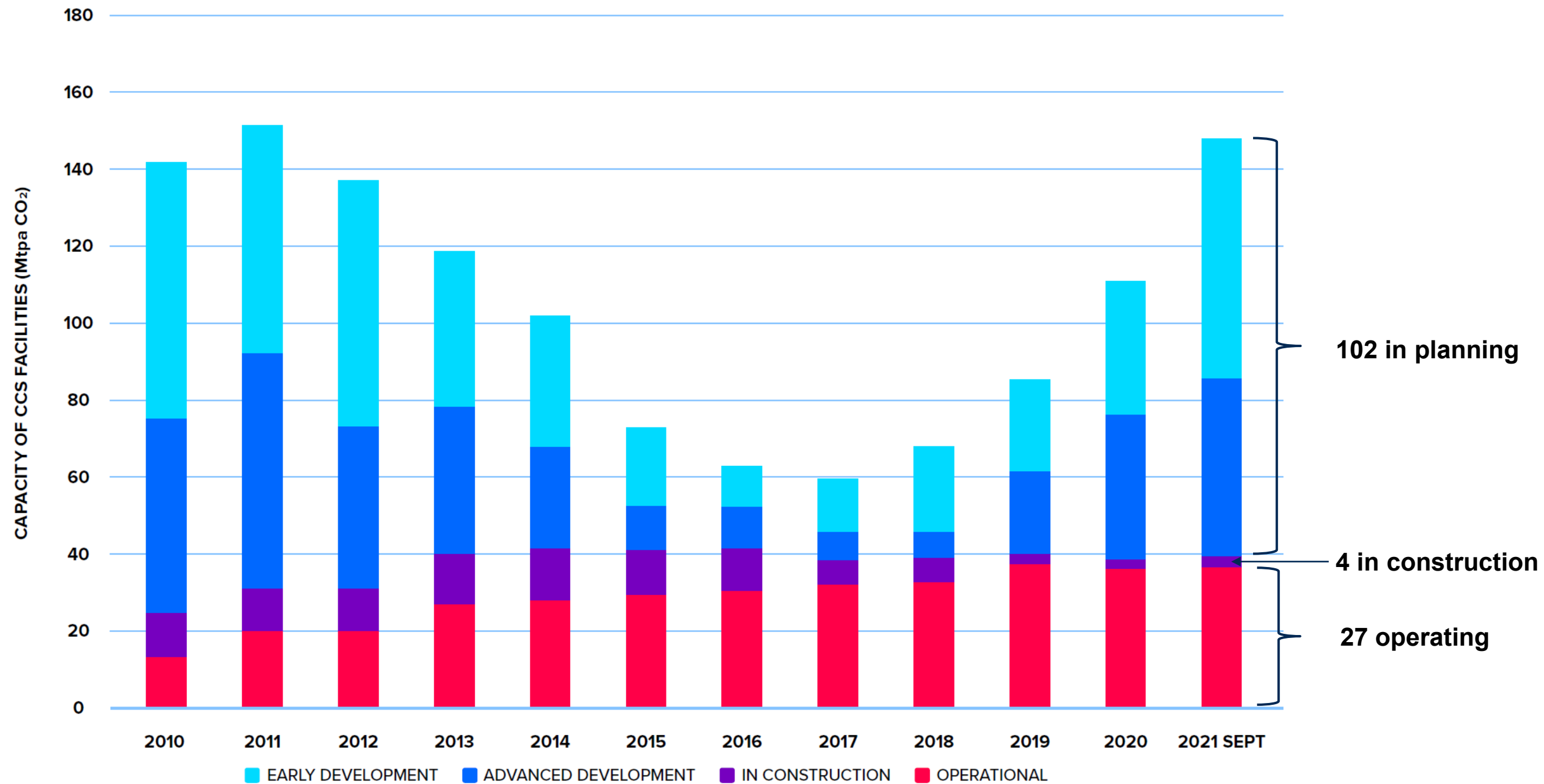
Providing low carbon dispatchable power.



Delivering negative emissions.

THE GLOBAL STATUS OF CCS IN 2021

FOUR YEARS OF GROWTH IN THE PROJECT PIPELINE.



+71
NEW
FACILITIES

+32%
CAPACITY

135
FACILITIES
TOTAL

* 135 total includes 2 facilities that have suspended operations – not shown on the chart

71 NEW FACILITIES ADDED IN 2021

- 41 new commercial facilities added in North America (31 of these part of the Summit Network), 35 in Europe and 5 across the rest of the world.
- First commercial facilities in Belgium, Denmark, Hungary, Indonesia, Italy, Malaysia and Sweden.
- First CCS applications in LNG liquefaction, first commercial DACCS project in Europe. First commercial cement CCS facility under construction. Several power CCS projects around the world.

DRIVERS OF CCS MOMENTUM IN 2021



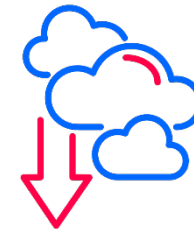
Strengthening policy support for CCS



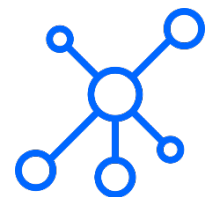
Blue Hydrogen Projects



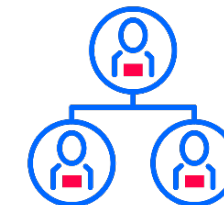
Net Zero Commitments from countries and companies



Technology-based Carbon Removal



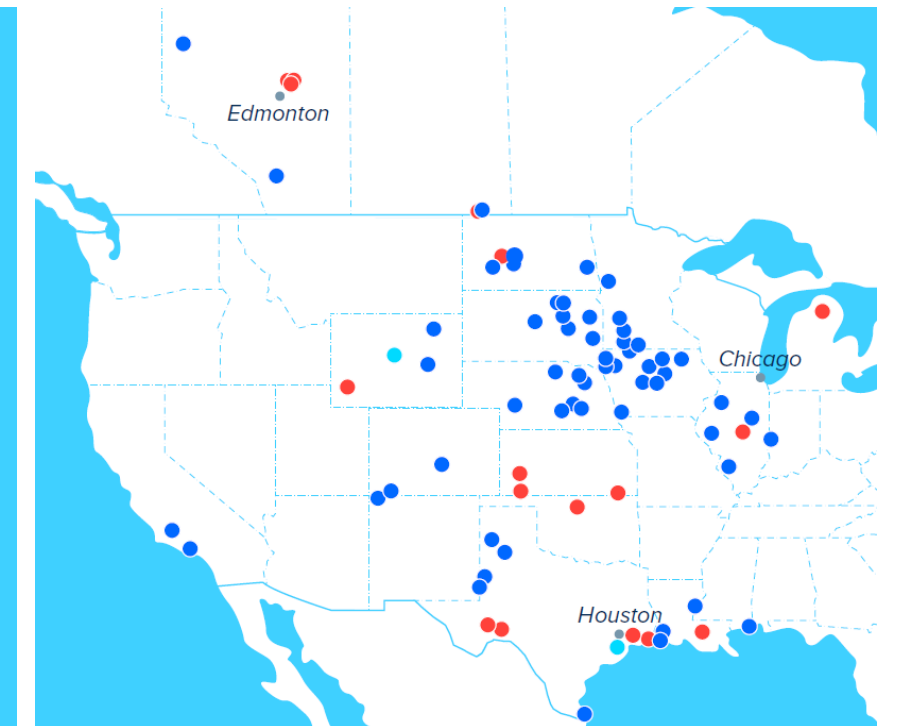
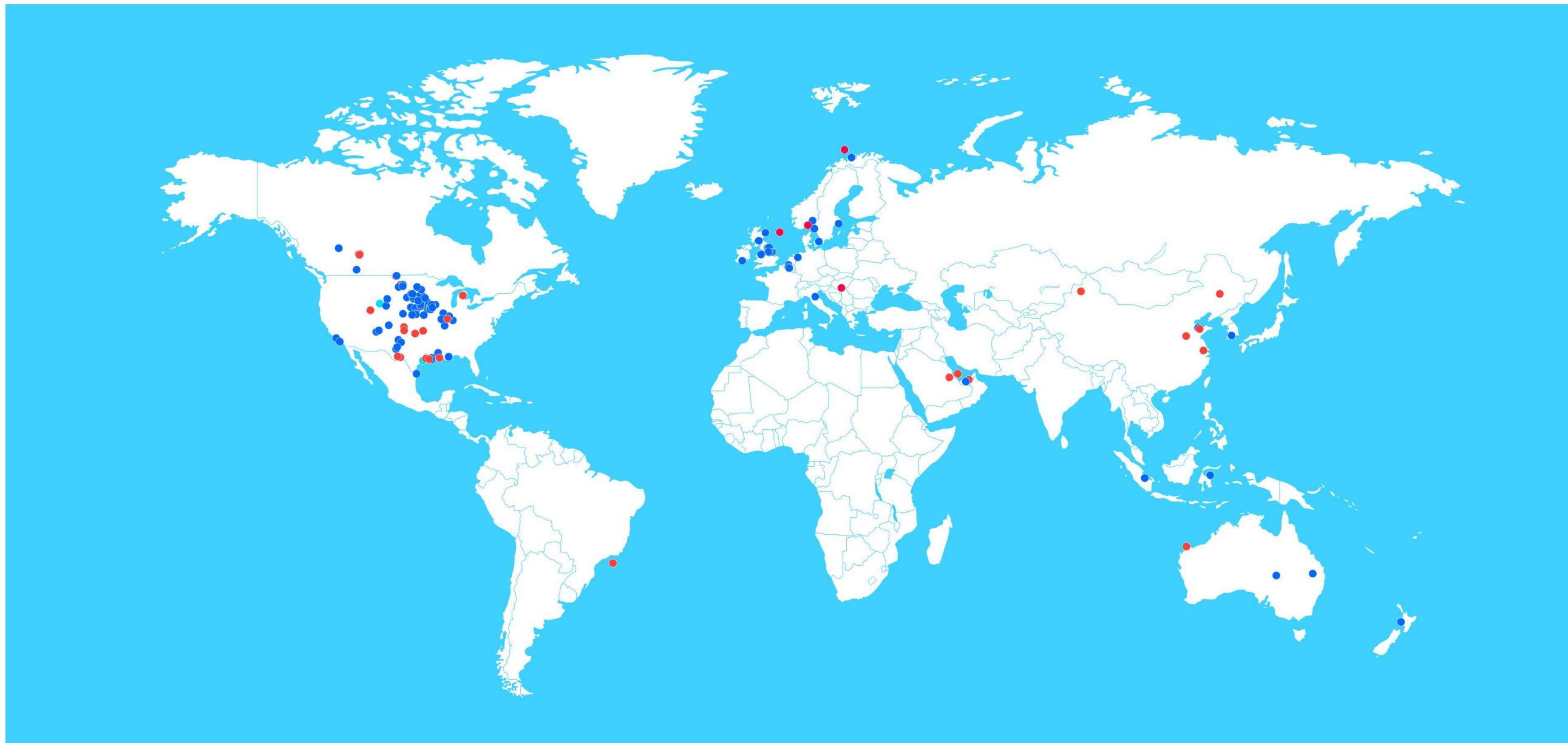
Rise of CCS Networks



Emergence of Strategic Business Partnerships

CCS FACILITIES

OPERATIONAL AND UNDER DEVELOPMENT



● COMMERCIAL CCS FACILITIES
IN OPERATION AND CONSTRUCTION

● COMMERCIAL CCS FACILITIES
IN DEVELOPMENT

● OPERATION SUSPENDED

CCS FACILITIES AROUND THE WORLD

	OPERATING	IN DEVELOPMENT	SUSPENDED	TOTAL
North America	16	60	2	78
China	3	3	-	6
Europe	3	35	-	38
Gulf Cooperation Council	3	1	-	4
Rest of World*	2	7	-	9
Total	27	106	2	135

INCREASING DIVERSITY OF CCS APPLICATIONS

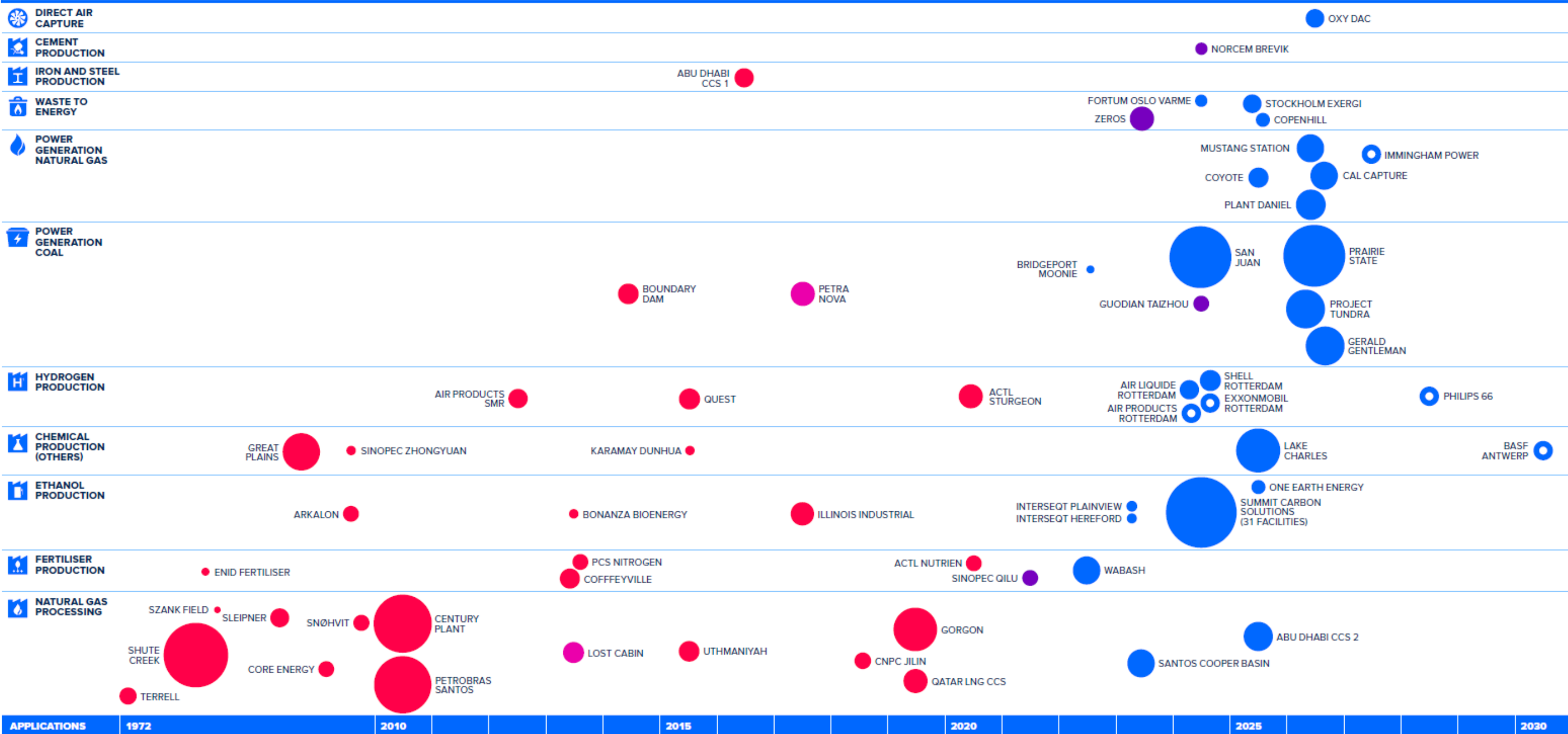
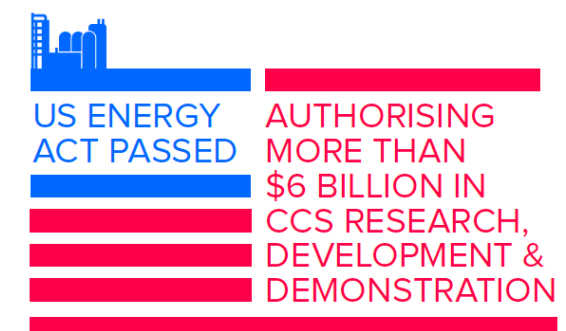


Chart indicates the primary industry type of each facility among various options.
● IN OPERATION ● IN CONSTRUCTION ● ADVANCED DEVELOPMENT CAPTURE CAPACITY TBC
● OPERATION SUSPENDED

Size of the circle is proportionate to the capture capacity of the facility.
● 0.2 ● 1.0 ● 5.0 Mtpa OF CO₂

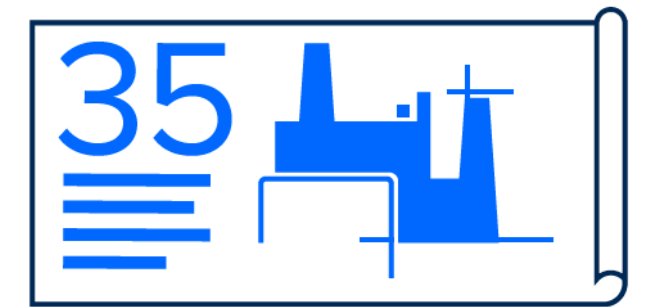
NORTH AMERICA

- More than 40 facilities in North America added to the Institute database in 2021.
- In February 2021, the US rejoined the Paris Agreement.
- The US Energy Act of 2020 passed, which authorised more than \$6 billion for CCS research, development and demonstration for FY 21 – FY 25.
- Major bills introduced in the US Congress during 2021 to augment 45Q tax credits.
- Canada's Budget 2021 proposed an investment tax credit for CCS projects. Proposed regulations for Clean Fuel Standard include use of CCS to generate credits.
- Biorefinery networks and low-carbon LNG with CCS emerging.

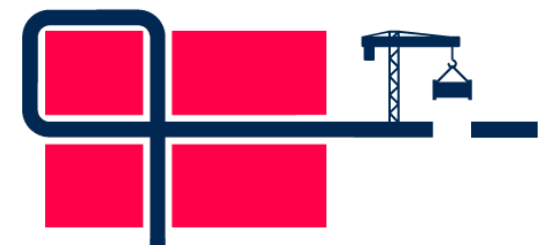


EUROPE

- More than 30 commercial facilities under development in Europe, with construction having started in Norway's Langskip CCS network.
- The EU made climate neutrality by 2050 a binding target, along with reducing emissions by 55% by 2030.
- Over 60 projects with a CCUS component applied to the first call of the EU's €20 billion Innovation Fund, with several progressing to the final round.
- The UK aims to establish 4 CCS networks by 2030 capturing 10 mtpa, with £1 billion allocated to support CCS development.
- The Dutch Government allocated SDE++ subsidy to capture facilities in the Port of Rotterdam network.



Construction is underway on the Norwegian project, Langskip.

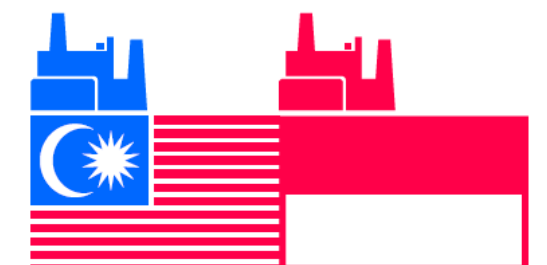


ASIA PACIFIC

- 5 new facilities in APAC added to the database.
- First commercial CCS projects announced in Indonesia and Malaysia.
- China launched its Emission Trading Scheme, covering >2000 power plants. CCS included in China's 5-year plan for the first time.
- Australia is including CCS in its Emissions Reduction Fund and allocated \$300 million in funding for CCS projects and networks.
- Japan is pursuing blue hydrogen opportunities and driving transnational cooperation in CCS.



AUSTRALIA
INCLUDES CCS
IN EMISSIONS
REDUCTION FUND



FIRST COMMERCIAL PROJECTS
FOR MALAYSIA & INDONESIA

GCC STATES

- 3 CCS facilities in operation in the GCC States, capturing 3.7 Mtpa of carbon dioxide, equivalent to 10% global capture capacity.
- Qatar Ras Laffan and UAE Al Reyadah facilities are developing expansion plans.
- Bahrain, Qatar, Saudi Arabia and UAE include CCS in their NDCs* under the Paris Agreement.
- Power generation and blue hydrogen are expected to emerge as new CCS drivers in the region.
- The Global CCS Institute is opening its inaugural GCC office in Abu Dhabi.



* Nationally Determined Contributions: climate plans of signatory countries to the Paris Agreement.

CCS: VITAL TO NET-ZERO

- Despite progress in 2021, to achieve net zero emissions, CCS capacity must increase by 100-fold by 2050.
- Between US\$655 - \$1,280 billion in capital investment is needed in the next three decades.
- Stronger policy to incentivize rapid CCS investment is overdue.

STRONG POLICY ACTION NEEDED



Define the role of CCS in meeting national emissions reduction targets and communicate this to industry and the public.



Create a long-term, high value on the storage of CO₂.



Support the identification and appraisal of geological storage resources.



Develop specific CCS laws and regulations.



Ensure emissions abatement policies are inclusive of all options (including CCS).



Identify opportunities for CCS networks and facilitate their establishment.



Provide capital grants, low-cost finance and/or guarantees to reduce the cost of capital for CCS investments.

THANK YOU

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