

Accelerating Carbon Capture, Utilisation and Storage

The Carbon Sequestration Leadership Forum (CSLF) Technical Group brings together countries to share experience on carbon capture, utilisation, and storage (CCUS) at the technical level. The Technical Group provides relevant technical background for the work of the Clean Energy Ministerial (CEM) CCUS Initiative, whose aim is to accelerate CCUS strategies and policies.

The CSLF 2021 Technology Roadmap (TRM 2021) stressed the challenging deployment pathway for CCUS in the coming decades, based on the IEA Sustainable Development Scenario (SDS):

- By 2030: CO₂ capture and storage should increase by a factor of 10 – 15 from the 2020 level of 40 mega-tonnes (Mt) of CO₂ per year.
- By 2050: CO₂ capture and storage should increase by a factor of 100 or more from the 2020 level.

To meet these challenges the TRM 2021 recommended efforts in the following key areas:

- Technology development, innovation, and cost reduction.
- Strategic build-out of CCUS projects and hubs.
- Development of strategy, policy, legal, and financial frameworks.

Below are highlights regarding the progress towards the key Recommendations on CCUS in the CSLF Technology Roadmap 2021:

1. Technology development, innovation, and cost reduction – investments increase:

- a. Several CSLF members as well as international partnerships have allocated significant funding to Research, Development and Demonstration (RD&D) for CCUS.
- b. Transferring knowledge is continuously taking place, amongst other in numerous workshops, for example the CSLF Technical Group meeting in Bergen, Norway, June 2022.
- c. There has been significant increase in activities and funding for pilots on Carbon Dioxide Removal (CDR) and Greenhouse Gas Removal (GGR) technologies.

The progress is rated as good and contributes to meeting the challenges in the CSLF TRM 2021.

2. Infrastructure projects and hubs are moving forward:

- a. One additional project has begun construction (Northern Lights in Norway) and three others have received significant private and public funding to proceed to Final Investment Decision (FID): the East Coast Cluster and the Hynet project in the United Kingdom, and the Porthos project in the Netherlands.
- b. The number of infrastructure projects and hubs in planning has increased by a factor of two. The hubs can serve as an enabler for industries without technical capability for CO₂ storage, and the diversity of industries that are now planning CCUS is increasing.
- c. New funds have been made available for infrastructure and hubs projects in USA, Canada, and Europe.

13th Clean Energy Ministerial meeting, September 21-23, 2022

- d. In Canada, the province of Alberta is leading a competitive process to allocate CO₂ pore space to hub operators
- e. The Oil and Gas Climate Initiative (OGCI) has launched The CCUS Hub Platform, a tool to help industrial emitters and transport & storage operators to identify potential hubs and learn lessons on how best to set them up from the most advanced hubs.

Progress is encouraging as an extensive number of potential hubs and clusters have been identified, and several are in early planning. However, the progress is insufficient to meet the challenge of a 10-15-fold increase in captured and stored CO₂ by 2030. ***More projects need to enter the Front-End Engineering and Design (FEED) phase and make the final investment decision.***

3. Development of strategy, policy, legal, and financial frameworks show progress

- 123 countries have submitted updated Nationally Determined Contributions to the UNFCCC but just 16 include CCS and three implicitly include CCS. COP26 adopted the Glasgow Climate Pact and important changes to Article 6 of the Paris Agreement.
- In addition to the UNFCCC agreements, several bilateral, multilateral, and global agreements have come into place
- National or regional CCUS strategies, incentive frameworks, business models, risk-sharing mechanisms, and legal, regulatory, and accounting frameworks are being implemented in several countries, including Australia, Brazil, Canada, China, Denmark, Indonesia, Japan, the Netherlands, Nigeria, Norway, Saudi Arabia, South Africa, United Arab Emirates, United Kingdom, and United States.

Progress is encouraging but insufficient to meet the challenge of a 10-15-fold increase in captured and stored CO₂ by 2030. ***More countries need to put the necessary regulations and financial frameworks in place.***

4. Overall conclusion

The deployment of CCUS lags behind what is needed to meet the challenge to increase CCUS deployment by a factor of 10-15 above 2020 level (40 Mt CO₂/year) by 2030.

Deployment of CCUS at scale is not possible without supportive policy settings, long-term political commitment, public engagement, and the appropriate financial support for early and long-term CCUS deployment.

The CSLF Technical Group invites all its members, Clean Energy Ministerial Members, and all other relevant countries, as well as industry and the financial sector, to join forces to work together to achieve rapid and tangible progress on the above pathway.

The CSLF will continue to offer a platform for its member governments, industry and the financial sector to come together to identify both immediate and longer-term investment opportunities and to accelerate CCUS deployment.

The CSLF 2021 Technology Roadmap is available at: www.cslforum.org