



GLOBAL CCS
INSTITUTE

A SERIES ON THE ROLE OF CCS AT COP 27, PART 2

COP 27 OUTCOMES

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CONTENTS

KEY TAKEAWAYS	3
THE GLOBAL STOCKTAKE (GST)	4
ARTICLE 6	6
FORUM ON THE IMPACTS OF RESPONSE MEASURES	8
THE TECHNOLOGY EXECUTIVE COMMITTEE (TEC) AND THE CLIMATE TECHNOLOGY CENTRE AND NETWORK (CTCN)	9
OUTLOOK	10
APPENDIX I	11



KEY TAKEAWAYS

- The Global Stocktake process facilitates discussions that can clarify the role of CCS in energy and industry system transformations in countries and highlights the need for holistic and integrated approaches that consider the needs of all stakeholders. At the second technical dialogue session of the GST:
 - The United States discussed the role of CCS in the Inflation Reduction Act
 - Saudi Arabia (representing the Like-Minded Developing Countries¹) discussed the value of CCS within national economic contexts and energy access
 - Norway provided proven examples of CCS projects underway
 - India discussed its future plans for CCS
 - Kenya was interested in lessons learned, policy, infrastructure and finance of CCS in Africa
 - Other remaining developing countries expressed limited interest in CCS
- Guidance on Carbon Dioxide Removals (CDR) in Article 6 market mechanisms will continue to be developed in 2023 through the Article 6.4 Supervisory Body.
- The forum on the implementation of response measures is designed to maximize the positive and minimize the negative impacts of mitigation policies. At COP 27 the forum encouraged parties to explore CCS in this space, develop regulatory frameworks, remove barriers and strengthen policy support to drive innovation and deployment to scale-up CCS.
- The newly established joint work programme of the Technology Executive Committee (TEC) and the Climate Technology and Energy Network (CTCN) aims to dig deeper into hard-to-abate industrial sectors, particularly steel and cement. Through the joint work programme, developing countries can request technical assistance and capacity building for technology projects.
- As CCS is increasingly featured in developing country Nationally Determined Contributions (NDCs), the technology's role in achieving the sustainable development goals (SDGs) will come to the fore.
- COP 28 in Dubai, which also marks the end of the first GST cycle, is expected to continue the progress for CCS and result in further action on an international scale to accelerate its deployment.

¹ Algeria, Bangladesh, Bolivia, China, Cuba, Ecuador, Egypt, El Salvador, India, Indonesia, Iran, Iraq, Jordan, Kuwait, Malaysia, Mali, Nicaragua, Pakistan, Saudi Arabia, Sri Lanka, Sudan, Syria, Venezuela and Vietnam.

THE GLOBAL STOCKTAKE (GST)

WHAT IS THE GST AND WHAT ARE ITS IMPACTS?

The Global Stocktake (GST), embedded in Article 14 of the Paris Agreement, is a process that occurs in five-year cycles that aims to assess the world's collective progress towards achieving the purpose of the Paris Agreement and its long-term goals. This first GST cycle will end in COP 28 Dubai and will inform the upcoming cycle of government climate plans, or Nationally Determined Contributions (NDCs). The collective assessment will make use of the best available science to enhance ambition in a cross-cutting manner and further facilitate addressing climate change collectively. The outputs of the first GST will consist of key political messages and recommendations, best practices, new opportunities and lessons learned for the various thematic areas, without being policy-prescriptive.

WHAT'S THE PROCESS AND WHERE DOES CCS FIT IN SO FAR?

The Technical Dialogues (TD) of the GST are conversations among Parties, experts and Non-Party Stakeholders to share information and develop a common understanding on the status of progress. There are a total of three TDs scheduled before the publication of the outcomes document at COP 28. The Institute participated at the first TD at the Climate Conference in Bonn in June 2022 and subsequently published a [Bonn Outcomes report](#). The [summary report of the first TD session](#) (TD1.1), was published in October 2022 by the co-facilitators and included language on “the need for CO₂ removal to meet emission targets, based on technological options for carbon capture and storage, as well as the limitations of those options. Participants discussed differences in technological readiness and risks, and the entailed potential benefits and adverse effects”.

WHAT HAPPENED IN SHARM EL-SHEIKH?

The second TD (TD1.2) at COP 27 focused on how gaps in the implementation of the Paris Agreement can be bridged. In the run up to the conference, the Institute responded to the call for poster inputs and the creative space with a poster (Appendix I) and a [CCS explainer video](#), both of which were displayed during the first week of the conference with an informal Q&A and the opportunity for one-on-one discussions with the participants organized. Like Bonn, TD1.2 also included an informal “World Café” to explore topics related to Mitigation, Adaptation and Means of Implementation, as Party and non-Party participants rotate and circulate through the various issues in their selected topic. Mitigation discussions included early signs of transformation and key actions to accelerate it, where it was discussed that CCS networks can play a role. Also like Bonn, TD1.2 included Roundtables that allowed for in-depth discussions on specific topics, such as assessing progress in enhancing mitigation efforts in energy production and consumption. Finally, TD1.2 introduced Focused Exchanges, hosted by the co-facilitators with invited panellists on topics concerning pathways towards low GHG emissions, climate-resilient development and international cooperation on holistic and integrated approaches.

LEARNINGS AND OUTLOOK

During the TD session at Sharm el-Sheikh, the Business and Industry Constituency (BINGO), which the Institute is a part of, highlighted the need for involvement of all stakeholders in governmental processes of updating NDCs and developing sectoral decarbonisation and financing plans. BINGO also proposed a stakeholder contribution channel, which can serve businesses and other organizations to provide data on a five-year or potentially more dynamic basis, on actions, research and development, innovative financial mechanisms, sectoral opportunities, technology options, analyses of impact and the provision of direct technical input and advice that could increase collective action on climate change.

At TD1.2, the United States, Saudi Arabia (on behalf of the Like Minded Developing Countries), Norway, India and Kenya showed both action and interest in CCS (see Key Takeaways), while Non-Government Organizations and well as the Women and Gender and Youth Constituencies raised their concerns.

The summary report of TD1.2 by the co-facilitators is expected before the third and final technical dialogue (TD1.3) of the next GST session in Bonn.

ARTICLE 6

WHAT IS ARTICLE 6 AND HOW DOES IT RELATE TO CCS?

Article 6 of the Paris Agreement allows countries to pursue voluntary cooperation to achieve emission reduction targets set out in their NDCs, allowing for higher mitigation ambition and adaptation actions to promote sustainable development and environmental integrity. The key paragraphs in Article 6 are as follows:

Article 6.2: allows countries to trade emission reductions and removals with one another through bilateral or multilateral agreements. These traded credits are called Internationally Transferred Mitigation Outcomes (ITMOs). Ghana, Vanuatu and Switzerland presented the first-ever bilaterally authorized project to be implemented under this mechanism at COP 27. ITMOs issued from CCS projects under Article 6.2 are up to the cooperating countries' discretion. Key issues to unlock Article 6.2 primarily involve ITMO accounting and reporting, including the process for country authorizations and use of ITMOs and the application of corresponding adjustments (where a reduction transferred to one country's NDC is deducted from the other country's NDC) to avoid double counting of emissions and registry transparency. ITMOs generated through bilateral agreements under Article 6.2 can potentially be used in the 6.4 mechanism as well, which is subject to further discussion and clarification.

Article 6.4 will create a global carbon market overseen by the Article 6.4 Supervisory Body (SB). Project developers will need to request to register their projects with the SB, which must be approved by both the country where it is implemented, and the SB itself, in order to issue UN-recognised carbon credits. These credits can be bought by countries, companies, and individuals. Article 6.4 replaced the Clean Development Mechanism (CDM), which generated tradeable Certified Emission Reductions (CERs), operated under the Kyoto Protocol, which only looked at reducing emissions in developed countries. [Rules for CCS project activities](#), known as 'modalities and procedures' were adopted for the CDM at COP 17 Durban and provide a guideline for the generation of CERs from CCS projects². To date however, no approved CCS project methodologies under these modalities and procedures have been agreed. It should also be noted that how CDM modalities and procedures and methodologies will be transferred to the Article 6.4 mechanism is still being discussed. Because of global needs to address Reduction of Emissions from Deforestation and Degradation (REDD+), a removals methodology is currently being developed at the SB, which needed to include "nature-based removals" and "engineered removals" with the latter having implications to CCS on matters related to accounting for permanence of CO₂ stored underground. The SB has met three times this year, and submitted their recommendations on activities involving removals the day before COP 27 began. However, these recommendations were not adopted at COP 27, and the work will continue.

WHAT WERE THE KEY ARTICLE 6 DECISIONS IN SHARM EL-SHEIKH?

Article 6.2 text includes guidance relating to tracking and recording ITMOs, interoperability, the international registry, centralized accounting and reporting platform, nomenclatures, database, the technical expert review, training, ITMO metrics, method for applying corresponding adjustments and the agreed electronic format. On the issue of transparency for example, there is language that if a participating Party identifies information as confidential, they should provide the basis for protecting such information. Technical questions remain in relation to corresponding adjustments, the technical expert review, the ITMO

² For more on developing CCS projects in the CDM, please see the following report from the Institute: <https://www.globalccsinstitute.com/archive/hub/publications/25786/manual-developing-ccs-projects-under-cdm.pdf>

authorization process, use of ITMOs, tables for submitting annual information, data inconsistencies, accounts in the international registry and common nomenclatures, which are to be considered for adoption at the next COP. A workshop is scheduled to be organized by 30 April 2023, with a request for the secretariat to prepare a technical paper on the issues identified in the workshop.

Article 6.4 text provides further guidance on the mechanism, including the implementation of the transition of activities and carbon credits from the CDM, operation of the mechanism registry and details on the share of proceeds to cover administrative expenses that will assist developing countries that are particularly vulnerable to climate change. Parties and observer organizations are invited to submit their views on activities involving removals by the 15th of March 2023. This includes appropriate monitoring, reporting, accounting for removals and crediting periods, addressing reversals, avoidance of leakage, and avoidance of other negative environmental and social impacts. The SB is requested to consider these views to further develop recommendations.

FORUM ON THE IMPACTS OF RESPONSE MEASURES

WHAT ARE RESPONSE MEASURES AND HOW DO THEY RELATE TO CCS?

Response measures are defined as the positive and negative effects arising from the implementation of mitigation policies and programmes undertaken by Parties to combat climate change. They can be “in-jurisdiction” and “out-of-jurisdiction” or cross-border impacts and may include emission trading schemes, carbon taxes and levies, subsidies, carbon border adjustments and carbon labelling. As economies move away from reliance on fossil fuels, the impacts of response measures on CCS can be explored in the broader context of sustainable development and just transition.

Response measures have been recognized since the start of the Convention under the UNFCCC in 1992. Since then, the following significant milestones have been achieved:

- The establishment of a forum on the impact of response measures implementation in COP 16
- The agreement that the forum will serve the Paris Agreement in COP 21
- The agreement on the modalities, work programme and functions of the forum through the Katowice Committee of Experts on the Impacts of Implementation of Response Measures (KCI) in COP 24
- The agreement on the six-year workplan of the KCI in COP 25

WHAT HAPPENED IN SHARM EL-SHEIKH?

Carbon capture, utilization and storage (CCUS) features explicitly in the [report of the forum adopted in COP 27](#), as below.

- Activity 5 of the workplan looks to enhance the understanding of Parties, through collaboration and input from stakeholders, the potential for to assess the economic impacts resulting from the impact of response measures, where Parties are encouraged to:
 - Explore CCUS to maximize the positive and minimize the negative impacts of the implementation of response measures
 - Develop regulatory frameworks for carbon capture, transport, utilization and storage at the regional or global level to explore the possibility of standardizing the design and application while ensuring high safety standards
 - Remove barriers and strengthen policy support for CCUS to drive innovation and deployment to ensure successful scale-up

THE TECHNOLOGY EXECUTIVE COMMITTEE (TEC) AND THE CLIMATE TECHNOLOGY CENTRE AND NETWORK (CTCN)

WHAT ARE THE TEC AND THE CTCN AND HOW DO THEY RELATE TO CCS PROJECTS?

The Technology Mechanism was established at COP 16 in Cancun, in order to drive technology innovation, investment, and deployment to reduce GHG emissions and improve resilience to the effects of climate change. It consists of two bodies: the Technology Executive Committee (TEC), which serves as the policy arm, and the Climate Technology Centre and Network (CTCN) which serves as the implementation arm. Critical to the process, the CTCN delivers technical assistance and capacity building at the request of developing countries, mobilising the expertise of a global network of over 760 civil society, finance, private sector and research institutions through the UN Environment Programme (UNEP). The CTCN has some experience with CCS in Texas so far, but has not received requests from developing countries for the development of CCS projects.

WHAT HAPPENED IN SHARM EL-SHEIKH?

Senior officials from several governments, UNEP and the UNFCCC launched a new five-year work programme to promote climate technology solutions in developing countries. The new mechanism covers work from 2023-2027 and foresees specific joint activities and common areas of work to be implemented by the TEC and CTCN, including technology roadmaps, national systems of innovation and industry. The joint work programme is a significant milestone for the Technology Mechanism which is said to signal a new era of work for climate technology to implement the Paris Agreement, guided by science and focused on high-potential sectors and high-impact actions. The work programme being guided by science is relevant for CCS given its inclusion in the mitigation pathways of the IPCC's Working Group III Sixth Assessment Report. Language in the new workplan includes that "the TEC will dig deeper into hard-to-abate industrial sectors, in particular the steel and cement industries, to promote low and near zero emission production and products." Financial contributions to the new joint work plan at COP 27 came from the United States, the European Union, Canada and the Republic of Korea.

OUTLOOK

The Sharm el-Sheikh Implementation Plan adopted in COP 27 recognizes that limiting global warming to 1.5 °C requires rapid, deep and sustained reductions in global greenhouse gas emissions of 43 per cent by 2030 relative to the 2019 level. The latest Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Working Group III Report, along with the increase in the number of NDCs that include CCS, has demonstrated the science and policy behind the role that CCS should play in our shift towards low-carbon emissions pathways.

As we continue a full-scale systems transition, COP 27 heralded the announcement of the deployment of one of the world's largest CCUS hubs in the world by the Saudi Green Initiative (SGI). Meanwhile, the increased inclusion of CCS in developing country NDCs suggests the scale-up of the technology in new territories, illustrated in Africa and Caribbean through South Africa's CCUS pilot project funded by the government with the World Bank, the upcoming launch of Nigeria's Africa Centre of Excellence for Carbon Management and Technology Innovation, and Trinidad and Tobago's ongoing CCS Program development.

The Sharm el-Sheikh Implementation Plan also stresses the complex and challenging global geopolitical situation and its impact on the energy, food and economic dimensions. In this critical decade for implementation, there is the pressing need for all solutions for climate action, including CCS technologies, to be integrated within the broader context of the Sustainable Development Goals (SDGs). With next year's climate conference in the United Arab Emirates, presided by Dr Sultan Al Jaber - Minister of Industry and Advanced Technology, Managing Director and Group CEO of the Abu Dhabi National Oil Company, Chairman of Masdar and special envoy for climate change - significant policy conversations and industry developments for CCS on a global scale are expected on the horizon.

APPENDIX I



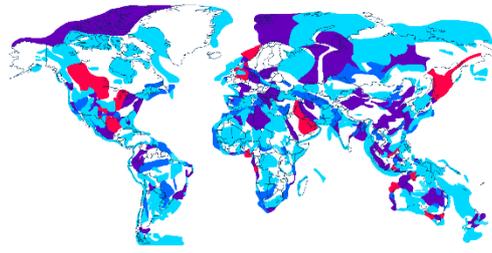
CCS IS PROVEN, SCALABLE AND NECESSARY TO ACHIEVE THE PARIS ACHIEVEMENT OBJECTIVES, BUT DEPLOYMENT RATES ARE NOT FAST ENOUGH.



CCS has been in use for more than 50 years around the world and have the capacity to capture and store more than 40 MtCO₂ each year.



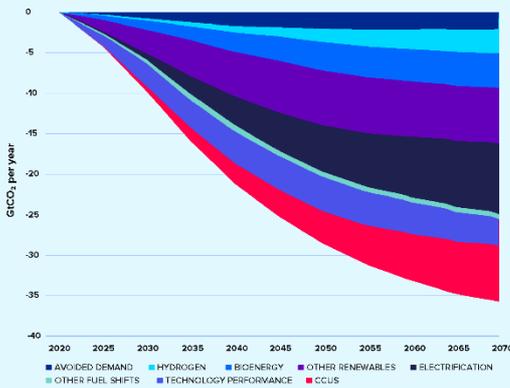
● COMMERCIAL CCS FACILITIES IN OPERATION AND CONSTRUCTION ● OPERATION SUSPENDED
● COMMERCIAL CCS FACILITIES IN DEVELOPMENT



● HIGHLY SUITABLE ● SUITABLE ● POSSIBLE ● UNLIKELY



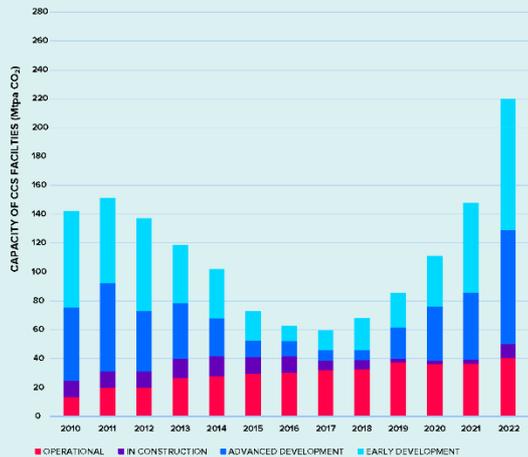
The IPCC includes CCS as a key mitigation technology in its illustrative mitigation scenarios and the IEA demonstrates CCS accounts for 15% of emission reductions towards net-zero.



SOURCE: IEA (2020), ENERGY TECHNOLOGY PERSPECTIVES 2020. ALL RIGHTS RESERVED, AS MODIFIED BY GLOBAL CCS INSTITUTE.



CCS projects are on the rise, but current global rates of deployment are far below the IPCC modelled pathways to limit global warming to 1.5°C or 2°C.



CCS APPLICATIONS ARE BECOMING MORE DIVERSE, WHERE CCS NETWORKS ARE A COST-EFFECTIVE SOLUTION FOR MANY COUNTRIES & COMPANIES



Direct Air Capture



Hydrogen Production



Iron and Steel Production



Cement Production



Bioenergy with CCS



Natural Gas Processing



Natural Gas Power



Ethanol Production



Waste Incineration



Fertiliser Production



Biomass Power



Oil Refining



Coal Fired Power



Chemical and Petrochemical Production

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