

Technology Collaboration Programme by IEA



IEAGHG



1st Meeting of the Network of National CCUS Centers of Excellence (NNCCE)

Organised by IEAGHG and GCCC
Virtual, 30th July

Technical Review 2025-TR05
October 2025

IEAGHG

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Leading the way to net zero with advanced CCS research. IEAGHG are at the forefront of cutting-edge carbon, capture and storage (CCS) research. We advance technology that reduces carbon emissions and accelerates the deployment of CCS projects by improving processes, reducing costs, and overcoming barriers. Our authoritative research is peer-reviewed and widely used by governments and industry worldwide. As CCS technology specialists, we regularly input to organisations such as the IPCC and UNFCCC, contributing to the global net-zero transition.

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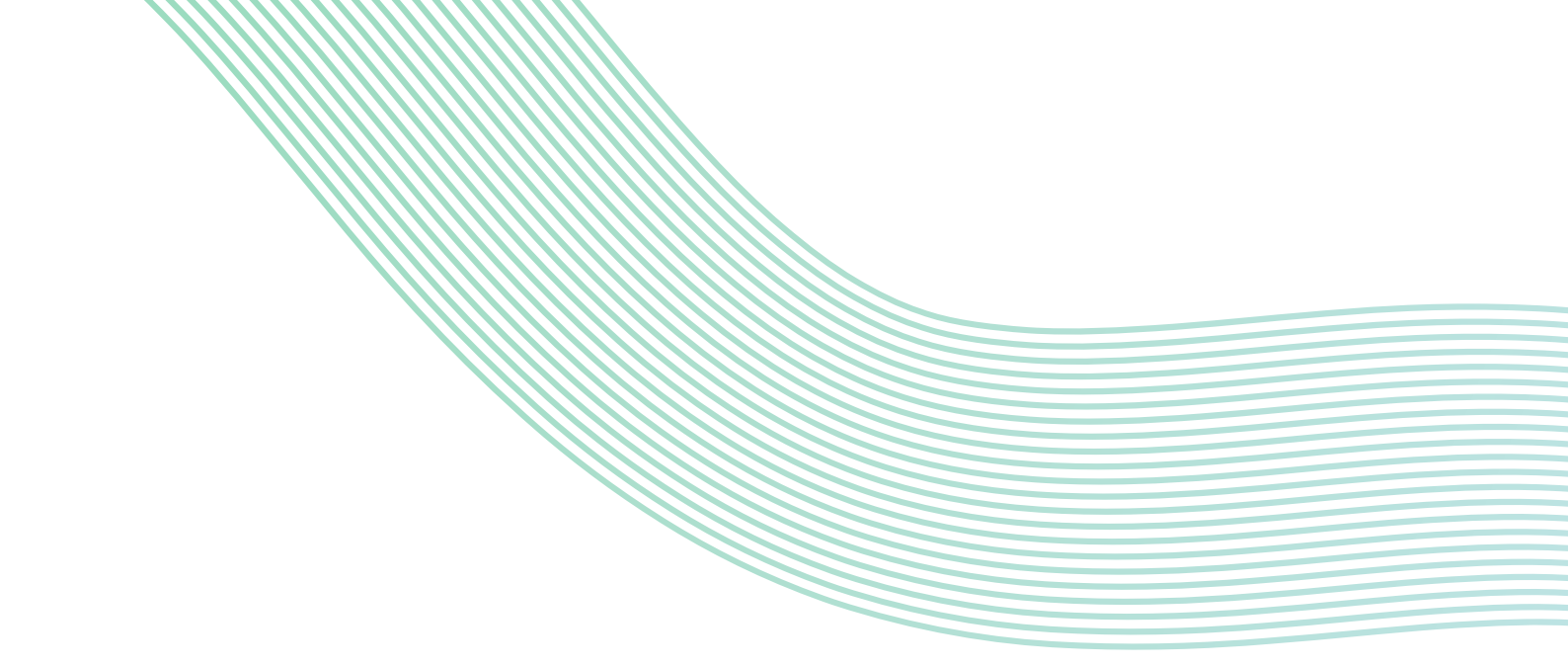
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Citation

The report should be cited in literature as follows: 'IEAGHG, "1st Meeting of the Network of National CCUS Centers of Excellence (NNCCE)", 2025-TR05, October 2025, doi.org/10.62849/2025-tr05'

Acknowledgements

This report was prepared by Samantha Neades and edited by Katherine Romanak and Tim Dixon

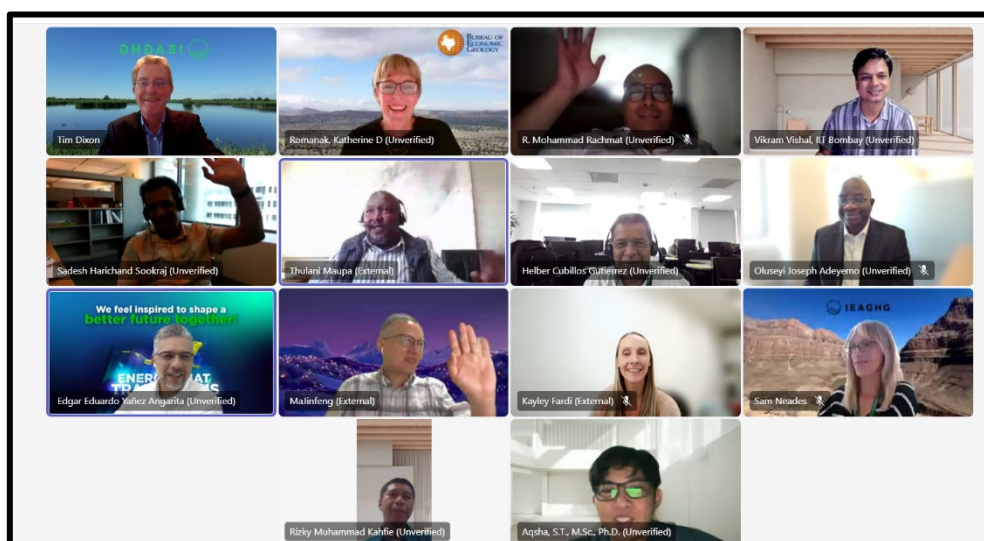
Network of National CCUS Centers of Excellence (NNCCE)

(Formerly Global Network of CCUS Centers of Excellence in the Global South)

Report of the 1st Meeting

Date: 30 July 2025

Location: Virtual (via MS Teams)



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Executive Summary

The inaugural meeting of the Network of National CCUS Centers of Excellence (NNCCE) was held virtually on 30 July 2025, bringing together over 20 representatives from leading CCUS institutions across the Global South. This Network is a joint program spearheaded by the IEAGHG and the Gulf Coast Carbon Center (GCCC) to support innovation, capacity-building, and collaboration in CCUS across developing regions.

The meeting marked the formal launch of the NNCCE, following a successful exploratory meeting in 2024 hosted at the International CCS Knowledge Centre in Regina Saskatchewan Canada in conjunction with a tour to Boundary Dam capture facility. At this launch meeting, participants shared progress updates, discussed common challenges, and identified opportunities for collaboration across research, policy, and implementation of carbon capture, utilization, and storage (CCUS) technologies.

Key insights from the meeting highlighted that while funding remains a widely shared barrier, centers also face technical and regulatory obstacles, including limited access to subsurface data, lack of permitting frameworks, and difficulty building bankable project pipelines. Nevertheless, several centers have demonstrated success by leveraging academic-industry partnerships, developing national storage atlases, launching pilot projects, and initiating national policy dialogues.

A major theme of the discussion was the power of peer-to-peer knowledge exchange. Participants expressed strong interest in deeper collaboration through joint proposals, technical workshops, and rotating summer schools. The IFC provided insight into how centers can improve the bankability of their projects and reaffirmed its interest in supporting both upstream and downstream CCUS initiatives in the Global South.

The network voted to adopt the official name: Network of National CCUS Centers of Excellence (NNCCE). Members agreed to hold a follow-up virtual meeting in late 2025 or early 2026 to identify priority technical and policy topics for joint exploration of resources on these. The group emphasized the importance of sustaining this collaboration through regular dialogue, shared tools, and collective advocacy for CCUS as a development-enabling technology.

Purpose of the Meeting

The meeting marked the formal launch of a new international initiative designed to foster innovation, collaboration, and capacity-building across key development sectors for CCUS in the Global South. The Network aims to connect leading institutions and individuals committed to advancing excellence in CCUS research, policy, and implementation through a collaborative and regionally tailored approach.

Network Overview

The Network belongs to its members and will function as a platform to provide tangible value in their respective countries and regions. The initiative is rooted in the idea of equitable collaboration and mutual benefit, building on exploratory discussions first hosted in October

2024 in Regina (with additional virtual attendance). The Network's goals and founding structure were discussed, highlighting the importance of member-led participation and diverse representation across sectors and geographies. IEAGHG and GCCC are the facilitators.

Regional and National Center Updates

Trinidad and Tobago

Trinidad and Tobago has made significant strides in building national CCS capacity, supported in large part by international knowledge transfer efforts. A major milestone came in 2019, when the country hosted its first international CCS symposium—an event that helped catalyze national awareness and momentum around carbon capture and storage. This was followed by the development of a **Carbon Atlas**, launched with government support in 2021, which is systematically mapping emissions sources and potential geological storage sites across the country. Further strengthening the national CCS ecosystem, the **University of Trinidad and Tobago (UTT)** and the **University of the West Indies (UWI)** formalized a collaborative partnership in 2024 to pool expertise and drive joint research initiatives. Despite this progress, challenges remain. Chief among them is the limited availability and quality of subsurface data, which continues to constrain project development. While gaining the first-ever support from the Green Climate Fund (GCF) has helped unlock some datasets, many critical resources remain either incomplete or inaccessible due to confidentiality restrictions. Building stakeholder trust and implementing transparent, secure mechanisms for data sharing will be essential to fully realizing Trinidad and Tobago's CCS potential.

- **Challenges:**
 - Data availability and quality remain major hurdles. While GCF funding helped unlock some datasets, critical subsurface information is still either incomplete or withheld due to confidentiality restrictions.
 - Building stakeholder trust and ensuring transparent data-sharing mechanisms are ongoing priorities.

Indonesia CCS Center (ICCSC)

Indonesia is positioning itself as a regional hub for carbon capture and storage, leveraging its vast geological potential, industrial base, and strong momentum from government and academic institutions. The Indonesia CCS Center, which brings together experts across disciplines, has been instrumental in shaping a national vision for CCUS. The country is estimated to have over 600 Gt of CO₂ storage potential and currently has 19 pre-commercial CCS projects in the pipeline. These span sectors including power, cement, and LNG, demonstrating a strong industrial appetite for decarbonization. Projections show that a robust CCS value chain could contribute up to 0.6% to GDP annually and create approximately 80,000 jobs per year. Indonesia's CCS roadmap has attracted interest from major multilateral institutions such as the IFC, World Bank, and ADB. However, implementation has slowed under a newly elected government, which introduced additional layers of coordination across

ministries and agencies. Despite this, efforts are underway to strengthen enabling frameworks and increase financial viability to support project advancement.

- **Challenges:**
 - Financing remains a key barrier—most projects are still not financially viable without concessional or blended capital.
 - Policy coordination across agencies has become more complex following recent political transitions.
 - Regulatory frameworks for permitting and long-term liability are still emerging.
-

Institut Teknologi Bandung (ITB) – Indonesia

ITB serves as a National Center of Excellence for CCS in Indonesia, with a mandate that spans research, training, technical services, and policy support. Since its establishment in 2017, ITB has conducted a wide range of feasibility studies for industrial decarbonization, including low-carbon LNG production, CO₂-EOR, and power plant retrofits. The center supports national CO₂ storage mapping efforts and is actively engaged in shaping regulations and stakeholder outreach. Its interdisciplinary CCS team now includes over 80 researchers, and in 2025, ITB launched a new CCS and EOR laboratory equipped for reservoir simulation, core analysis, and injection modeling. ITB is also fostering international collaboration and is exploring innovative solutions such as cross-border CO₂ injection, allowing emitters from other countries to store CO₂ in Indonesia in exchange for carbon credits. These initiatives are helping to attract investment and international partnerships.

- **Challenges:**
 - Difficulty integrating institutions across the CCS value chain, particularly on MRV systems and liability concerns.
 - Economic feasibility remains a constraint, especially without carbon pricing or incentives.
-

India – IIT Bombay (IITB)

India's CCS program is anchored by the National Center of Excellence in CCUS at IIT Bombay, supported by the Department of Science and Technology. The center is focused on developing scientific confidence in India's CO₂ storage potential and providing technical support to national and industrial policymakers. Major research themes include CO₂ capture, source-sink mapping, and storage capacity assessments for deep saline aquifers, EOR, ECBM, and basalt formations. IITB is also engaged in cluster and hub design studies, identifying pathways for decarbonizing India's emissions-intensive sectors. Despite increasing recognition of CCS in national discourse as evidenced by the recent announcement of a CCS mission, there is a gap between policy ambition and implementation capacity. IITB's work has been central to bridging that gap by contributing to regulatory design and supporting engagement with industry, though demonstration-scale funding remains elusive.

- **Challenges:**
 - Insufficient R&D funding to demonstrate large-scale CCS feasibility.
 - Lack of an established CCS regulatory framework delays implementation.
 - Government policy is evolving, but institutional coordination remains slow.
-

South Africa – Council for Geoscience (CGS)

South Africa's CCS efforts are being led by the Council for Geoscience, which took over national CCS responsibilities from SANEDI in 2020. Their work is focused in Mpumalanga, a region with high emissions from coal-based energy and industry. Key accomplishments include drilling an 1,800-meter characterization well and acquiring 3D seismic data to evaluate potential storage formations. The project has explored both deep saline aquifers and basalt formations, with modeling support from Icelandic collaborators. Environmental authorization for a 10,000 to 50,000 tonne pilot injection has been secured, marking a critical step toward implementation. However, the end of World Bank trust fund support has left a funding gap that must now be filled through industrial partnerships or alternative financing. CGS is also working to rebuild international engagement and raise the country's CCS profile, which diminished during the COVID-19 period and a leadership transition.

- **Challenges:**
 - Loss of multilateral funding has stalled progress toward commercial deployment.
 - Private sector engagement is needed to bridge the pilot-to-scale-up gap.
 - The country's early leadership in CCS needs to be reactivated through international visibility.
-

China – Northwest University

The Joint Engineering Research Center for CCUS at Northwest University in Xi'an has transitioned from fossil fuel research to a strong focus on geological CO₂ storage, particularly in saline aquifers. The center has implemented pilot projects near chemical and coal-fired power plants, with CO₂ capture capacities reaching up to 500,000 tonnes. A notable area of innovation involves storage in abandoned coal mines, although limited data availability and site restrictions pose technical and regulatory hurdles. The university has initiated 3D seismic acquisition and borehole planning to address these data gaps, and projects have garnered strong interest from large industrial partners. One of the most pressing issues is securing land access—many suitable sites lie outside designated industrial zones or overlap with protected areas. As a result, even well-funded projects can be delayed or canceled due to planning and permitting conflicts.

- **Challenges:**
 - Land access issues due to zoning or environmental protection designations.
 - Limited deep borehole and seismic data at key storage sites.

- Difficulty aligning promising projects with regulatory and land-use constraints.
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Morocco – University Mohammed VI Polytechnic (UM6P)

Morocco's CCS efforts have gained traction through the leadership of UM6P, which has strategically aligned CCUS with national industrial decarbonization priorities. Early skepticism—largely due to Morocco's relatively low emissions and strong renewable energy focus—has given way to recognition that CCS is essential for hard-to-abate sectors. The phosphate industry (OCP) has emerged as a national champion, working closely with UM6P to integrate CCS into Scope 1 decarbonization efforts. The university also hosted the first Africa CCUS Forum, bringing together regional and international stakeholders and raising Morocco's profile on the continental CCS stage. The center has focused on stakeholder education, technical training, and identifying financing opportunities for pilot projects. However, operating as a CCS unit within a broader university setting limits its visibility and resourcing. There is growing consensus that a standalone CCS center would better serve national and regional goals.

- **Challenges:**
 - Competing national priorities (renewables, hydrogen) have historically overshadowed CCS.
 - CCS work remains diluted within the broader university structure.
 - Lack of institutional visibility makes it harder to attract sustained funding and attention.
-

Colombia – Ecopetrol

Ecopetrol is in the process of formalizing a CCS Center of Excellence as part of its broader decarbonization strategy. The company has already completed pre-feasibility studies for multiple storage clusters and is preparing for its first pilot CO₂ injection project in September 2025. These efforts focus on pairing EOR with storage to generate near-term value while developing long-term storage capacity. The company is also engaging with external partners to expand technical capacity and validate early findings. While internal alignment and technical progress are strong, several challenges remain, especially around regulatory uncertainty and the difficulty of engaging external stakeholders due to cybersecurity constraints. Efforts are underway to build partnerships with universities and share data more widely, while learning from peer institutions in the Global South.

- **Challenges:**
 - Regulatory framework for CCS is still unclear, slowing project progression.
 - Internal cybersecurity protocols restrict public engagement and data sharing.
 - More external partnerships are needed to support capacity building and knowledge dissemination.

Key Themes from the Discussion

Across the Network, several common challenges continue to emerge that could benefit from coordinated discussion and shared strategies. One of the most pressing issues is the drop-off in funding once early support from multilateral development banks ends. Many centers struggle to maintain momentum without a clear path to sustainable financing. Compounding this are challenges around data access—particularly when data are held by private operators—and constraints related to land use, permitting, and unclear or underdeveloped regulatory frameworks.

Key shared challenges include:

- Funding limitations, especially after early MDB support phases out
- Data access and confidentiality barriers
- Land use and permitting constraints
- Limited or fragmented regulatory frameworks

Despite these hurdles, promising solutions and best practices are starting to take shape. A recurring theme is the importance of credibility. Centers that consistently deliver technical outputs and stakeholder engagement tend to regain momentum, even after initial support fades. Some are also developing more resilient funding models by combining consultancy services with reinvestment strategies. Partnerships with universities and a strong emphasis on public engagement have proven effective not only in technical implementation but also in building national awareness and legitimacy for CCS. Early involvement of industrial players, as both co-developers and co-funders, is also showing promise.

Emerging solutions and practices:

- Reinventing early momentum through credibility and consistent delivery
- Blending consultancy income with reinvestment into core center functions
- Leveraging university ties and public outreach to grow awareness and support
- Bringing in industrial players early as partners, not just stakeholders

As the Network matures, so do opportunities for collaboration. There is growing interest in developing joint proposals for multilateral funding, particularly those that draw on cross-country expertise in site selection, MRV systems, and policy frameworks. Rotating summer schools and staff exchanges across centers could be effective mechanisms for technology transfer, while also avoiding duplication of effort. A more deliberate approach to sharing tools and approaches could help scale successful practices more rapidly.

Opportunities for collaboration:

- Joint multilateral proposals to access larger funding pools
- Shared learnings on pilot site selection, MRV design, and regulatory innovation
- Summer schools and cross-center exchanges to accelerate knowledge transfer
- Practical mechanisms to reduce duplication and amplify best practices

Centers of Excellence are already proving to be powerful vehicles for technology transfer and capacity building, but their impact will be limited without more investment, including in the Network itself. This includes support for convenings, travel, and joint training activities. There's also a clear need for creative models that can help newly-forming centers get off the ground while helping more advanced centers scale and diversify.

Looking ahead, key needs include:

- Dedicated funding for Network-wide coordination and convenings
- Early-stage support mechanisms to help nascent centers mature
- Scalable models that help successful centers expand their reach

IFC Engagement

The International Finance Corporation (IFC) provided insight into their evolving strategy on industrial decarbonization. CCUS is now recognized as central to meeting job creation and industrial growth goals in emissions-intensive sectors.

IFC shared the following key points:

- Willingness to co-develop projects through feasibility studies and technical assistance
- Need for credible sponsors and a clear pathway to bankable investments
- Interest in engaging with national centers to guide project shaping
- Active engagement in Nigeria and openness to regional multi-country proposals
- Potential avenues for concessional financing through the Climate Investment Fund (CIF)

Conclusions and Recommendations

The inaugural session of the Network made clear that, while each Center operates in a distinct national context, many face similar structural and resource challenges. Funding gaps—particularly post-grant or post-MDB support—and limited access to critical data are nearly universal. At the same time, barriers that are technical, political, or institutional tend to vary widely by country, underscoring the need for both shared learning and tailored support.

Key takeaways include:

- Centers face a mix of shared challenges (e.g., funding, data access) and country-specific barriers (e.g., permitting, politics)
- Regional collaboration and peer exchange are essential for accelerating technical and policy progress
- Small pilot projects—even those with limited funding—are proving to be powerful credibility builders
- Public outreach and early industry involvement remain vital for long-term success
- Diversifying funding—from multilateral donors to private sector co-investment—is crucial for Center sustainability

There was strong support for structured mechanisms to support ongoing exchange. A rotating summer school, periodic regional events, and co-developed tools (such as shared MRV protocols or public engagement materials) were identified as high-value next steps. These activities not only support technical advancement but also foster a sense of shared identity and trust among members.

Network Governance

In a key decision, members voted to name the initiative the Network of National CCUS Centers of Excellence (NNCCE). The name reflects the national mandate many centers hold while reinforcing the Network's collective commitment to excellence and collaboration.

Next Steps

The group agreed to reconvene for a virtual meeting in December 2025 or January 2026, with the goal of identifying and advancing specific technical and policy topics of mutual interest and the resources available to share on these topics. These follow-on discussions may lead to:

- Thematic mini-workshops or technical webinars
- Co-development of shared public engagement tools
- Joint design of MRV protocols adapted to regional conditions

This first formal meeting laid a strong foundation for deeper collaboration. The next phase will focus on translating shared priorities into action—building the technical, policy, and public trust pillars needed for effective CCUS deployment across the Global South.

Participants are encouraged to subscribe to:

- **IEAGHG News**
- **GCCC Newsletter and phone book**
- **International CCS Knowledge Centre Updates**
- **and be aware of the Carbon Management Challenge new stakeholder group**

Appendix A: Meeting Participants

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Julian Antonio Caicedo Avellaneda	Ecopetrol	Colombia
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