



2023 THOUGHT LEADERSHIP

INDIA'S CARBON CREDIT TRADING SCHEME & THE INDIAN GOVERNMENT'S CCUS REPORT



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1.0 KEY MESSAGES

1. India's central government has passed an amendment to the Energy Conservation Bill that will enable the setting up of a domestic carbon credit trading scheme. The Lower House passed the amendment in August 2022 and the Upper House in December 2022 and it is now law. Entities within India that are allotted credits will be able to trade them domestically.
2. NITI Aayog, an Indian central governmental think tank, released a policy framework paper on CCUS on 29 November 2022. The Prime Minister serves as Chairperson. The policy framework is a recommendation to the government sanctioned by the think tank and is authored by many contributors who bring significant CCUS experience and expertise.
3. The report is wide-ranging and acknowledges that CCUS can contribute to decarbonisation and to energy transition. Carbon credits are the main recommended policy mechanism, with a further recommendation of carbon taxes in the future. The report covers costs in various sectors, an overview of international pricing and financing mechanisms, and a recommendation for India to set up a public sector corporation to promote and help finance CCUS projects in the country.
4. The timing is notable as the passing of the amendment and the release of the report came just after India updated its Nationally Determined Contributions at COP 27 in November 2022. This further reiterates that the central government has a key role in ensuring that India has the right incentives and financing mechanisms in place, along with a supportive policy framework, to meet its climate commitments.
5. While CCUS is not yet included in the carbon credit trading scheme, the CCUS Report makes a recommendation for an incentive-based approach and mentions carbon credits as a key mechanism. There is flexibility for CCUS to be included in the future as the regulations to set up the trading scheme are drafted. This is not without precedent since several jurisdictions have broadened their policy frameworks to include CCUS. It is worth noting that India has included CCUS as a removal activity under the Article 6.2 mechanism.

Acronyms

45Q	Section 45Q of the United States tax code	EU	European Union
ADB	Asian Development Bank	GBP	Green Bond Principles
CCS	Carbon capture and storage	GHG	Greenhouse gas
CCFC	Carbon Capture Finance Corporation	Mtpa	Million tonne per annum
CCUS	Carbon capture utilisation and storage	NCoE-CCU	National Centres of Excellence in Carbon Capture and Utilization
COP27	27th session of the Conference of the Parties to the UNFCCC (Egypt)	NDC	Nationally Determined Contribution
COP28	28th session of the Conference of the Parties to the UNFCCC (United Arab Emirates)	UNFCCC	United Nations Framework Convention on Climate Change
ETS	Emissions Trading System	US\$	United States dollars

2.0 INDIA'S CARBON CREDITS TRADING SCHEME AND THE INDIAN GOVERNMENT'S CCUS REPORT

This publication is the second in a series on India's climate ambitions. It is recommended that the reader refer to the previous publication, India's Carbon Credits Trading Scheme – A New Beginning, for background information (Errol Pinto, 2022).

2.1 Carbon credit trading scheme – supported by law

The Energy Conservation Bill is an amendment to the law originally passed in 2001. Through the amendment's addition of new clauses, parliament authorized the establishment of a domestic carbon credit trading scheme. Consistent with India's climate goals, the carbon credits will not initially be available for export (Energy Conservation (Amendment) Bill 2022, 2022; Rajesh Kumar Singh & Bloomberg, 2022). The bill's provisions will permit the generation of carbon credits by public and private sector entities in India with the aim of reducing emissions. The carbon credit certificates will be domestically tradeable between companies and individuals, subsequently setting up a compliance market (Energy Conservation (Amendment) Bill 2022, 2022; Rituraj Baruah & Livemint, 2022).

In a previous publication on this topic, the Global CCS Institute noted the significance of India's Lower House of Parliament passing the amendment to the Energy

Conservation bill in August 2022 (Raja Sabha (Upper House) & Parliament of India, 2022). The Upper House took it up in December 2022 and subsequently passed it into law, marking a significant step for the set-up of a carbon trading system in India.

Referred to in the bill as a carbon credit trading scheme, the bill effectively authorizes the central government to set up a national carbon credit trading system. A carbon credit in this context is effectively a permit to emit a pre-specified quantity of CO₂ or other GHG emissions. Carbon credit certificates are earned by entities that are covered under the law by reducing emissions. While details are still to be finalised, the certificates are tradeable. This permit can also be purchased by entities that emit more than a pre-determined threshold or sold by entities emitting less than the threshold under the rules of the trading scheme (PRS Legislative Research, 2022). Registered entities will be able to trade credits between themselves, which will create a market for these certificates.

India's Power Ministry has begun the process of developing the carbon credit trading scheme by issuing a draft framework with a request for feedback from various stakeholders (Business Standard, 2023; Planet Outlook India, 2023). The scheme has been enacted with a focus on energy efficiency and CCUS is not formally included at the present time. However, the Ministry of Power and the Ministry of Environment, Forestry and Climate Change have indicated that the government

may have a willingness to include CCUS in the future. In a press release in February 2023, the ministry listed CCUS as a removal activity as part of its finalized list of activities under the Article 6.2 mechanism of the Paris Agreement, which will facilitate the mobilization of international finance and the simultaneous transfer of emerging technologies through the trading of carbon credits (Ministry of Environment & Government of India, 2023). The Ministry of Power's press release in May 2023, which announced the start of the policy development process for the Indian Carbon Market (ICM), states that methodologies for emissions reductions and removals will fall under the ICM's mandate (Press Information Bureau et al., 2023).

Additionally, India's budget for 2023 mentions green growth as a 'key feature'. The central government has also issued a green bond that will be used to finance green projects. The bond raised nearly US\$1 billion in domestic capital markets. These are components of sustainable finance that have surfaced in India in this calendar year (Nick Robins et al., 2023). While the financing for CCUS is currently not included, the CCUS Report discussed in section 2.3 below mentions bonds as a financing mechanism that the government could use to raise funds for the proposed subsidies that may be needed for CCUS in India.

2.2 India's G20 Presidency

In 2022, India updated its Nationally Determined Contributions (NDCs) through the UNFCCC (Aathira Perinchery & The Wire, 2022; Business Standard, 2022; UNFCCC, 2016). These updates were submitted in late August 2022, in the same month that India's Lok Sabha – or Lower House of Parliament – passed the amendment to the Energy Conservation Bill discussed above. The updates to India's climate commitments, approved by Cabinet, were improvements on the commitments made in 2016 (Press Information Bureau & Government of India, 2022).

India committed to reducing the emissions intensity of its GDP by 45% by 2030 when compared to 2005. This is an improvement from the 33-35% committed in the 2016 NDC. India also committed to achieving 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030, which is also an improvement from the 2016 NDC (40% in the original NDC).

India took over the G20 Presidency from Indonesia on 1 December 2022 and will hold it through 30 November 2023, which is also the day that COP 28 begins in the United Arab Emirates – a G20 Guest Country in 2023 (G20 Secretariat et al., 2023c; United Nations Climate Change, 2023).

Climate finance will be key for India to achieve its climate goals. The central government has indicated that it is a 'high priority' not only during its G20 presidency but is also a 'priority area' for the energy transition (G20 Secretariat et al., 2022, 2023b). In a primer document prepared for the G20 presidency, India has made several references to reducing carbon emissions and carbon intensity in addition to pursuing decarbonisation. The document also mentioned how CCUS can play a role in meeting energy and climate goals (G20 Secretariat et al., 2022).

In the 1st Energy Transition and 1st Sustainable Finance Working Group meetings held in February 2023, the central government – through the G20 Secretariat – made several references to low carbon development pathways and the deployment of the associated technologies (G20 Secretariat et al., 2023a). CCUS has an important role in decarbonisation and the development of a low carbon economy and is acknowledged in the CCUS Report released by NITI Aayog, the Indian central government think tank (NITI Aayog et al., 2022), discussed in section 2.3 below.

2.3 NITI Aayog's CCUS Report

In December 2022, a few months after the passage of the Energy Conservation bill, the India's government released a detailed report on CCUS titled Carbon Capture, Utilization and Storage (CCUS) – Policy Framework and its Deployment Mechanism in India (NITI Aayog et al., 2022). The report was commissioned by NITI Aayog, a think tank affiliated with India's central government and was prepared by Dastur, a consulting organisation. The report is a comprehensive overview of CCUS, sector-wide emissions, capture and utilisation technologies, potential for CO₂ storage, and policy frameworks that would be applicable for India to make carbon capture and storage a viable decarbonisation solution. The report analyses policies in jurisdictions like Australia, Canada, the EU, the United States and Canada and makes recommendations for the Indian context.



For example, the applicability of a tax credit like 45Q in the US and an emissions trading scheme like the EU ETS are discussed. The report also discusses CCUS investments and financing mechanisms in detail with a recommendation to the central government to set up a Carbon Capture Finance Corporation (CCFC) that would provide tax and cash credits for CCUS projects in India. The report proposes two mechanisms to fund the CCFC; the first is through a clean energy tax or levy imposed on coal, and the second is through government bonds and budgetary support for CCUS-related subsidies (NITI Aayog et al., 2022). Three types of projects are discussed with the associated subsidies suggested in Indian Rupees (2022). The numbers below are approximate current equivalents in US dollars:

- a. CO₂ sequestration/storage at US\$49/tonne until 2040 and US\$36/tonne until 2050.
- b. CO₂ EOR at US\$36/tonne until 2040 and US\$29/tonne until 2050.
- c. CO₂ utilization at US\$27/tonne until 2050.

It also mentions that CCUS technologies are essential to reduce emissions from India's hard-to-abate industries. These total emissions are estimated to grow to 2,400 Mtpa by 2050 and CCUS will have to increase to about 750 Mtpa to make a meaningful contribution to India's 2050 climate goals. To build this capacity and develop the domestic market, investments in the range of US\$100-150 billion (2022 dollars) will be needed over the next 30 years (NITI Aayog et al., 2022; Ruchira Singh & S&P Global Commodity Insights, 2022).

2.4 CCUS in the current Indian context

The timing of the amendment of the Energy Conservation bill and the release of the CCUS Report by the central government are notable. Both occurred within a few weeks after the end of COP 27.

While the Institute has previously noted that CCUS does not fit explicitly in India's NDC commitments (Errol Pinto, 2022), India's central government has a very good understanding of the role that CCUS can play in helping India achieve its climate objectives, made public with the release of the CCUS Report.

On the domestic front, India's government announced the establishment of two National Centres of Excellence in Carbon Capture and Utilization in 2022 (NCoE-CCU) (Ministry of Science and Technology & Government of India, 2022). The government will support their development through the Department of Science of Technology at the Indian Institute of Technology Bombay in Mumbai and Jawaharlal Nehru Centre for Advanced Scientific Research in Bengaluru. These two institutions will focus on research, development, and as centres for collaboration and other initiatives related to carbon capture and utilization. The NCoE-CCU in Mumbai was inaugurated in February 2023 (Indian Institute of Technology Bombay, 2023).

Additionally, India's international partnerships, notably with the United States, mention CCUS as a decarbonisation tool (United States Department of Energy, 2021) and India's Ministry of Science and Technology is evaluating CCUS technologies (Department of Science and Technology et al., 2022).

India's updated NDCs submitted before COP 27 include an updated target to further reduce the country's emissions intensity by 2030 and a stronger commitment to generating electric power from non-fossil fuel-based sources (Observer Research Foundation, 2022; Press Information Bureau et al., 2022), section 2.2 above includes details. For India to achieve these goals, CCUS technologies will be essential for the power generation and hard-to-abate industrial sectors to contribute to the country's climate ambitions.

CCUS will play a critical role in India's transition to net zero while also providing opportunities for research, development and demonstration. The government has acknowledged that capturing and storing carbon emissions will lead to the development of a 'circular carbon economy' (NITI Aayog et al., 2022; Shantanu Guha Ray & The Sunday Guardian, 2023).

2.5 Conclusions

India's central government has taken several steps towards filling in the blanks on the components needed for viable domestic emissions reduction pathways. While there is still a need to formalise a national framework, the outlines of a framework are beginning to take shape. Summarised below, there are some important takeaways from these developments.

Firstly, the establishment of a national carbon credit trading scheme will be significant for domestic companies seeking to reduce emissions in a country, with significant potential (Indian Brand Equity Foundation,

2022; The World Bank, 2021). With the global market for carbon credits estimated to be in the vicinity of US\$50 billion in the 2030s, the associated financial considerations also had a bearing on the government's decision-making (Anders Porsborg-Smith et al., 2023; Christopher Blaufelder et al., 2021). The next step would be the development of rules and regulations that will formalize how entities participate in the scheme (PRS Legislative Research, 2022). While CCUS is not currently included, decarbonisation technologies will be needed for India to meet its climate change goals and could be included in India's climate change policies in the future (Bharath Jairaj et al., 2023).

Secondly, the CCUS Report sanctioned and released by governmental think tank NITI Aayog is indicative of the level of importance that the government has placed in better understanding how CCUS can help with emissions reductions and be deployed domestically. The report is a detailed survey of the domestic international CCUS landscape with an overview of the financial and commercial mechanisms that may be needed for domestic viability.

Thirdly, the inauguration of two National Centres of Excellence in Carbon Capture and Utilization crystallise the growing importance of carbon capture as a decarbonisation technique. The government will provide financial support to these centres. While the ongoing research and development will be crucial for the country to embed carbon capture technologies as decarbonisation pathways, the development of policy, legal and regulatory frameworks will also be needed (Ministry of Science and Technology & Government of India, 2022).



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