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Carbon Markets in India: Need for a Cautious Approach

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The functioning of three key processes will be critical if India's proposed carbon market scheme is to be effective in cost-effective decarbonisation: the institutional mechanism overseeing carbon credit trading, the target-setting process, and the enforcement procedures for the scheme.

Though India's per capita emissions and historical emissions are much lower than the global average, it is currently the world's third largest emitter of climate change-inducing greenhouse gases (GHGs). In response, India has taken many proactive steps to limit its GHG emissions, such as introducing the perform, achieve, and trade (PAT) scheme for improving industrial energy efficiency and mandating renewable purchase obligations (RPOs). The proposed introduction of carbon markets is one such measure.

Over the last couple of years, India has developed the contours of setting up a domestic compliance carbon market, through measures such as amending the Energy Conservation Act (ECA) and notifying the carbon credit trading scheme (CCTS). It is expected that further details about the proposed scheme will be introduced shortly and be initially targeted at four sectors: iron and steel, cement, petrochemicals, and pulp and paper. In this article, we analyse the proposed carbon market scheme for India, and identify some challenges that would have to be overcome for the markets to effectively aid the country's decarbonisation efforts in a cost-optimal manner.

Carbon markets

Carbon markets have been around for some time. There are two types of carbon markets: voluntary and compliance. In voluntary carbon markets, also known as offset markets, carbon offsets are generated by project developers. These offsets are carbon emissions avoided through energy efficiency, renewable energy, or fuel switching projects. The offsets can also be generated by projects that remove carbon from the atmosphere through carbon capture, utilisation, and storage (CCUS) projects or afforestation projects.

Independent agencies verify these offsets using one of the various globally accepted standards. Companies buy these offsets to meet their self-determined targets for GHG emissions through several registries and trading platforms.

Compliance markets work on a cap-and-trade mechanism and are governed by mandatory regulations. They are also called emission trading schemes (ETS). They effectively prescribe quotas for the amount of GHGs that various firms and market participants can emit. Participants that overachieve their targets (that is, emit less than their quotas) can sell their savings -known as carbon credits - to those who underachieve their targets (that is, emit more than their quotas) through the carbon market. The expectation is that this will allow market dynamics to play out and optimise investment decisions on whether to buy carbon credits or invest in technologies to reduce their emissions. Some compliance markets allow a certain percentage of the compliance to be met from the voluntary market.

There are about 37 ETS currently implemented around the globe: one at the regional level, 13 at the national level, and the rest at the sub-national level. About 24 more are under consideration or development at various levels. The three largest ETS are the ones in the European Union (EU), California, and China. Some observations are worth noting about these schemes.

First, all three schemes have taken substantial time to stabilise. The EU's ETS was launched in 2005 and has gone through several reforms over its four phases till date. California's Cap and Trade (CaT) has also seen several reforms since its launch in 2013. China's ETS was launched in 2021 after almost nine years of sub-national pilots.

Second, the EU's ETS and California's CaT targets are based on absolute emissions, whereas China's ETS is based on emission intensity. The EU's ETS targets require a 62% reduction in the emissions of the covered sectors in 2030, compared to 2005 levels. This is in alignment with the EU-wide target of a 55% reduction in emissions by 2030. The total quota of emissions for the covered sectors goes down by a pre-specified linear reduction factor of 5.1% every year till 2030. The sectoral targets are based on the average of the top 10% in that sector. The sectoral target approach based on benchmarks avoids the complexity of setting targets for individual participants. The trajectory of the annual targets also gives a long-term certainty to the participants to guide their investment decisions.

> The ambition levels of the targets, long-term certainty, and effectiveness of the enforcement mechanisms play an important role, along with country-specific technical and economic factors, in determining the price of carbon credits.

Similarly, the total quota of emissions in the ongoing fourth compliance period of California's CaT falls by about 4% annually till 2030 , in line with its target of 40% reduction in 2030 from 1990 levels. China's ETS is based on targets for emission intensity; that is, tonnes of carbon emitted per unit of production, with no cap on absolute emissions. It also has a shorter review period of two years.

Third, there is substantial variation in the discovered price of carbon over time and across the three ETS. In the EU, the price per tonne of CO2e has varied between €50 and €100 in the last two years while the variation in California has been in the range of US$25 to US$40. The ambition levels of the targets, long-term certainty, and effectiveness of the enforcement mechanisms play an important role, along with country-specific technical and economic factors, in determining the price of carbon credits.

Progress in India

The Bureau of Energy Efficiency (BEE) published a draft policy paper in October 2022 on the proposed Indian carbon market (ICM). In December 2022, the Energy Conservation Act, 2001, was amended to empower the bureau to implement a compliance carbon market in India called the carbon credit trading scheme (CCTS). The scheme was notified in June 2023 with an overarching implementation framework. The bureau released draft details of the compliance mechanism and eligibility and process of accreditation of carbon verification agencies in October 2023. In December 2023, an important modification to the notified CCTS was made to allow for participation of the offset market.

The draft policy paper had proposed a phase-wise approach for the Indian carbon market with the pilot phase to be ready for implementation by 1 January 2023. The Bureau of Energy Efficiency recently said that the first phase of the scheme will be rolled out in 2024 for four key sectors.

We briefly discuss the contours of the CCTS being envisioned in India below.

The legislative backing for the CCTS comes from the Environment (Protection) Act, 1986 (EPA) and the Energy Conservation Act, 2001, amended in 2022. The Ministry of Environment, Forest, and Climate Change (MoEFCC) and the Ministry of Power (MoP) will be the nodal ministries for the scheme, and the Bureau of Energy Efficiency is to be its administrator. A national steering committee (NSC) is expected to oversee the functioning of the carbon market. The Grid Controller of India will be the registry for the issued carbon credits, while the Central Electricity Regulatory Commission (CERC) will be the regulator for the trading activities.

> The CCTS as notified in June 2023 focused only on the obligated entities that will get mandatory emission intensity targets. This indicated that the Indian carbon market would be a compliance market, at least in the initial phase.

The power exchanges, three of which exist, will be the trading platforms for the carbon credits. The institutional structure governing the carbon market is similar to that governing the existing perform, achieve, and trade scheme, which may eventually be merged into the CCTS. The CCTS as notified in June 2023 focused only on the obligated entities that will get mandatory emission intensity targets. This indicated that the Indian carbon market would be a compliance market, at least in the initial phase. However, a notification in December 2023 has expanded the scope of the carbon market to the voluntary offset carbon market whose scope and methodologies are expected to be released soon. Therefore, it is not clear as yet as to how the voluntary and compliance markets will interact.

We focus on three key aspects of the proposed scheme that would be critical for its effectiveness: the institutional mechanism to oversee the CCTS, the target setting process, and the process related to enforcement of the scheme.

Institutions and governance

The Bureau of Energy Efficiency will be the administrator of the CCTS with direct oversight from the NSC for the carbon market. The NSC will be an inter-ministerial committee with members including joint secretaries of various line ministries such as the the Ministry of Power, Ministry of Environment, Forests and Climate Change, Ministry of New and Renewable Energy, Ministry of Steel, Ministry of Coal, Ministry of Chemicals and Fertiliser, and a few others, in addition to five experts from outside the government. The NSC's

functions, amongst others, are to set the targets for the CCTS (based on recommendations from the Bureau) as well as to establish related procedures. The NSC can also constitute working groups with specific technical expertise. It is required to have one meeting every quarter.

However, given the range of functions entrusted to the NSC and that it comprises high-ranking officials of various ministries with multiple other responsibilities, there is a likelihood that it will remain only a formal committee accepting most of the recommendations provided by the Bureau or the working groups. This can limit the NSC's objective of providing oversight of the bureau's functions as an administrator. Further, the Bureau is housed under the power ministry, which is responsible for power generation, one of the major sources of emissions, rather than being housed under a 'neutral' agency.

The Bureau of Energy Efficiency is the nodal agency at the national level for energy efficiency and conservation activities. It also has substantial experience in administering the perform, achieve and trade scheme. However, overseeing a carbon market poses very different challenges since emissions can arise from multiple sources and monitoring them can be quite different from monitoring energy efficiency. It would require significant capacity building within the bureau to perform its function as an administrator of the proposed CCTS.

> The Ministry of Environment, Forest and Climate Change or perhaps even an agency under the Prime Minister's Office may be a more suitable agency to administer the CCTS, given its economy-wide impacts.

Due to all these factors, the environment ministry or an agency under the Prime Minister's Office may be a more suitable agency to administer the CCTS, given its economy-wide impacts. This is similar to other countries. For example, the EU's ETS is administered by the European Environment Agency and California's CaT is administered by the California Air Resources Board.

Another issue is the complexity of the processes involved because of two principal ministries - environment and power - overseeing the scheme. According to the draft compliance mechanism proposed by the Bureau of Energy Efficiency, the target setting process begins with the technical committee, which makes a recommendation to it, which, in turn, makes a recommendation to the NSC, which makes a recommendation to the power ministry, which makes a recommendation to the environment ministry, which finally notifies the targets. Not only is this process very cumbersome, it is also not clear what happens if the recommendations of one agency are not entirely acceptable to the next agency on the chain. In the interests of effectiveness and efficiency, it is desirable to make this process simpler and more transparent, with better defined roles and responsibilities for all the agencies involved.

Setting emission targets

Assigning emissions quotas to market participants is one of the most critical aspects of designing an effective CCTS. Each participant's decision on whether and when to invest in new technology or whether to purchase credits to meet the quota would depend on that.

If the targets are too lax - that is, the emissions quota is too high - it will have two implications. One is that it will not aid in furthering the decarbonisation agenda because participants will not have sufficient incentives to invest in efforts for greater mitigation. Two, since it will be easy for participants to achieve their targets, there will be an over-supply of carbon credits in the market compared to the obligation to buy credits - thus suppressing the price of credits in the market.

On the other hand, if the targets are too stringent - that is, the emissions quotas are too low - the investment requirements to meet the target would be higher. This is likely to lead to too few carbon credits on the market compared to the obligation for buying them, and hence very high prices for credits. This will lead to Indian industry becoming uncompetitive with its global peers, particularly in sectors that face international competition (either in the domestic or international markets), and lead to higher prices for goods. Therefore, setting emissions quotas or targets at the "right" level is critical.

The perform, achieve and trade scheme operated by the Bureau of Energy Efficiency was aimed at improving the energy efficiency of industries by giving them energy intensity targets. The proposed CCTS is modelled largely on the perform, achieve and trade scheme, in which individual industrial units are to be given emission intensity targets. The experience with the perform, achieve and trade scheme so far suggests that it seems to have had lax targets, resulting in an over-supply and under-pricing of energy saving certificates (ESCerts). Moreover, available evidence suggests that even these lax targets have not been enforced - that is, not all those obliged to buy ESCerts have bought them, which is likely to further lower compliance in future cycles. Based on this experience, and building on lessons from international practices, we highlight some issues that need to be considered while developing emission intensity targets for

the Indian CCTS.

Methodology of setting targets: There should be a transparent, well-defined methodology - perhaps varying by sector - that will be used to set emission intensity targets. Having such a methodology will provide clarity and confidence to the market participants, and enable them to devise their business strategy accordingly.

Clarity of targets: Clear, long-term visibility of target emission intensities will enable firms to effectively participate in the scheme, as it will enable them to make informed decisions about their investment strategies. Under the perform, achieve and trade scheme, only three-year targets are published, which may be too short a window to base investment strategies on. In contrast, the EU carbon markets have annual targets up to 2030, based on the best performing entity in the sector. Thus, the initial targets in the Indian CCTS could also be defined for all years up to (say) 2030. The next set of targets up to (say) 2035 can be published by (say) 2026 or 2027, to give participants sufficient visibility to plan their growth and investments.

Sector-wide targets: Under the perform, achieve and trade scheme, each entity or firm was given a separate energy intensity target. This made the scheme quite onerous since baselining of each entity's energy intensity is a prerequisite to defining targets. Moreover, such an approach effectively enables grandfathering of existing inefficiencies and does not incentivise those who have already taken steps to improve their energy or emission intensity. Therefore, setting sector-wide emission intensity targets - that is, a single target for (say) the entire iron and steel sector - would be preferable. This is the approach followed by many ETS, including the EU's ETS and CaT. Such a target could be based on linking it to the top few performers in the sector. In the Indian context, if it is felt that small and medium enterprises (SMEs) need special treatment given their relative limitations in ability to invest in technology, targets could be set separately for the large industry and SME segments within each sector.

> The CCTS compliance carbon market is not the only market proposed for trading carbon credits. The other proposals include a voluntary offset-based carbon market and a "green credits" scheme.

Target levels: As discussed earlier, setting the right emissions intensity target is critical to ensure effective decarbonisation and a competitive industry. In this regard, it should be kept in mind that India already has multiple domestic and international targets. For example, India's nationally determined contribution (NDC) commitment says that its emissions intensity will fall by 45% from 2005 levels, and there are also mandates for renewable purchase obligations to be met by all electricity consumers. These existing targets should, therefore, form the floor while determining sectoral target emission intensities after suitable sector-specific adjustments. Indeed, trends show that India has already achieved a 33% reduction in its emission intensity between 2005 and 2019.

Interaction with other markets: The CCTS compliance carbon market is not the only market proposed for trading carbon credits. The other proposals include a voluntary offset-based carbon market and a "green credits" scheme. Currently, there is insufficient clarity about how these different markets would interact. Moreover, the "value" of carbon credits on these different markets is likely to be quite different - it is hard to compare the green credits obtained for (say) afforestation with carbon credits in the offset market for (say) supplying improved cooking stoves with the carbon credits for reducing emissions intensity in (say) the petrochemicals sector. In particular, there may be greater methodological uncertainties and challenges in assessing carbon savings in the green credits and voluntary offset markets.

Moreover, the Bureau of Energy Efficiency, which will administer the compliance carbon market, has no expertise in assessing carbon credits from activities such as afforestation or disbursement of improved cooking stoves. Hence, it is best if the compliance carbon market - catering to a much larger share of emissions - is kept distinct from the other markets and the carbon credits in the compliance market are not fungible with credits in the other markets, at least until the markets attain some maturity. Subsequently, as in other markets, allowing a certain share of compliance to be fulfilled through the offset market can be considered.

Enforcement of targets

While setting of appropriate targets is a critical element of designing effective carbon markets, the entire mechanism rests on the ability to ensure that those not meeting their targets purchase the requisite number of carbon credits, with a credible threat of deterrent punitive action if they do not do so. In the absence of that, there would be little incentive for industry to adhere to the prescribed targets.

> There is no publicly available data on any penal provisions being invoked against defaulting entities under the perform, achieve and trade scheme. Indeed, the procedure for imposing a penalty on defaulting entities is very tedious.

The perform, achieve and trade scheme - in many ways the role model for the proposed CCTS - offers sobering evidence. Even in its first cycle, non-compliance - that is, neither meeting energy intensity targets nor purchasing the requisite ESCerts - was 8%, which meant that only 92% of the ESCerts expected to be purchased were actually purchased. Perhaps because no penal action was taken against such non-compliance, its second cycle saw compliance plummeting to about 50% despite multiple extensions to the deadline.

There is no publicly available data on any penal provisions being invoked against defaulting entities under the perform, achieve and trade scheme. Indeed, the procedure for imposing a penalty on defaulting entities is very tedious. It requires the Bureau of Energy Efficiency to inform the state designated agencies (SDAs) of the offending entities' state(s). In turn, the agencies are required to verify that the offending entities have not met their targets, and then file a petition before the respective State Electricity Regulatory Commissions (SERCs) to impose a penalty on the entities. The Commission is expected to carry out the due process of hearing the various parties, and so on before imposing the penalty. Clearly, this process is too complex for it to be successfully implemented, particularly given the severe capacity limitations in most state agencies.

There is also a legal uncertainty about penalties under the proposed carbon market. Since the scheme's origins can be traced to both the EPA and the ECA, it is not clear which law's provisions govern the penalties to be imposed and the process of their imposition. Legal clarity on this aspect is necessary to devise a simpler, direct process to penalise defaulters and give a credible signal about the action that can be taken against defaulting entities.

Perhaps, the CCTS definition can make it clear that the Bureau of Energy Efficiency can directly impose the requisite penalty on the defaulting entity based on a combination of certified emissions reductions achieved (as certified by an accredited carbon verification agency) and carbon credit certificates purchased and utilised to meet emissions intensity targets (certified by the registrar of the carbon markets). Naturally, any certificates that have been used to meet emission intensity targets should be extinguished forthwith and not be available for further trading. Moreover, non-compliance could also be flagged by auditors of the defaulting firms as a failure to adhere to a statutory requirement - thus bringing such failures to the attention of shareholders.

In addition, to provide sufficient confidence that the market is functioning effectively, the Bureau of Energy Efficiency should publish regular market monitoring and penalty reports providing various kinds of information. This can include sector-wise details of the number of entities that achieved emission intensity targets, the number of carbon credit certificates issued, the number of entities that did not achieve emission intensity targets, the number of carbon credit certificates obliged to be purchased by them, the number of carbon credit certificates actually purchased, the penalties imposed, the penalties recovered, and the names of defaulting entities (along with penalties imposed and recovered).

> It appears that the institutional structure for overseeing the scheme would need to be both streamlined and strengthened to provide able stewardship. This should be backed up by a simpler, but effective and transparent enforcement mechanism.

Other details, such as the volumes of certificates traded, the prices offered, the prices discovered, the number of certificates extinguished to meet intensity targets, and the number of outstanding certificates available for further trading should also be published to provide rich public information about the state of Indian carbon markets.

Conclusions

India is about to introduce an ambitious carbon market to help the decarbonisation of its hard-to-abate industries. This will also put the country in the league of nations that have functional carbon markets, and enable Indian firms to participate in global trade on an equal footing. However, achieving these goals will require careful design and implementation of the CCTS.

It appears that the institutional structure for overseeing the scheme would need to be both streamlined and strengthened to provide able stewardship. This should be backed up by a simpler, but effective and transparent enforcement mechanism that will encourage firms to participate in the scheme and meet their targets.

Finally, the setting of emissions intensity targets needs to be given considerable thought to ensure that they are neither too lax nor too stringent, and provide sufficient clarity about their future direction so that they encourage firms to take appropriate decisions about investing in decarbonisation technologies to meet the targets. All of these need detailed work and careful planning. Without that, there is a risk that India will soon have a carbon market in name, but that it will neither help in effective decarbonisation of Indian industry nor help it compete globally as the pressures to decarbonise increase.

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