Policy brief
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Emissions Trading as an Environmental Innovation in India

Measuring the Policy Impact on Emissions and Abatement Costs

In brief

- Emission trading schemes can improve environmental quality at a lower overall cost without damaging industrial growth.
- This study aims to design, introduce and test the effects of a pilot emission trading system (ETS) for particulate matter on plant emissions and abatement costs in India.
- A randomized-controlled trial design was implemented to measure the effects of the pilot ETS and the design was developed to account for the properties of particulate matter and the structure of environmental regulation in India.
- Initial research findings:
  - Emissions trading requires highly accurate monitoring verification of industrial emissions.
  - Trade can occur across industrial clusters but each cluster should have a local sub-cap.
  - Permits should be allocated through an auction.
  - A price ceiling can stabilise the permit market.
  - Compliance penalties fixed at a multiple of the permit price support permit demand.
- Implications for regulators:
  - Regulators should mandate the use of standardized continuous emissions monitoring systems in all participating plants.
  - A regulatory structure should be established to ensure compliance.
  - Regulators should solicit private expertise to help implement the emissions market.

Motivation

"The research will be a crucial input to the design of the proposed particulate emissions market"

This study aims to design, introduce and test market-based environmental regulation in India. Flexible, market-based mechanisms such as emission trading schemes (ETSs) can achieve the important regulatory goal of improving environmental quality at lower overall cost — that is, without inhibiting industrial growth. Working jointly with environmental regulators, we will measure the effects of a pilot emissions trading system (ETS) for particulate matter on plant emissions and abatement costs using a randomized- controlled trial design.

This note describes findings from the initial phase of the study on the appropriate design of the particulate emissions market. This design has been developed to account for both the properties of particulate matter as a pollutant and the structure of environmental regulation in India.

Policy Impact

The research will be a crucial input to the design of the proposed particulate emissions market. It is a first draft of the rules of the market – how are permits to emit distributed, how does trade occur, what are the penalties for non-compliance, etc. – and will be developed further with the Ministry of Environment & Forests into a full-fledged implementation plan. This market design can set a precedent for the use of market-based environmental regulations in India.

Audience

The policy audience for the trading protocol is manifold. First, the Ministry of Environment & Forests (MoEF) and Central Pollution Control Board (CPCB), the central authority in environmental regulation, will use this design as a draft to move forward with emissions trading. Second, the State Pollution Control Boards (SPCBs) will consult the trading protocol as they set up systems for permit tracking and reconciliation. Third, industry and civil society groups may provide suggestions on this protocol before a final market design is adopted.

Policy Implications

"A price ceiling can stabilize the permit market"

Emissions trading requires highly accurate monitoring verification of industrial emissions

To enable trade of permits, regulators must verify the total mass of emissions from each industrial plant. Continuous emissions monitoring systems (CEMS) at all participating sources are essential to have a trusted and reliable market-based regulation.

Trade can occur across industrial clusters but each cluster should have a local sub-cap

Completely free trade across distances farther than particulate matter typically

travels in the air would allow a concentration of pollutant emissions in a single region. Though this geographic concentration has not been observed with emissions trading systems to date, it can be ruled out entirely by limiting not only overall emissions but also emissions within each industrial cluster, as defined by a 75 km radius around the cluster centre.

The compliance and trading period can be one year

For this pilot, a one-year trading period will allow industries to learn about their emissions over time, become accustomed to trading and lower the transactions costs of complying with the new scheme. In the future the compliance period may be partitioned into seasons depending on the observed variation in emissions within a year.

Permits should be allocated through an auction

Auctioning is the preferred method of allocation to show that the government is establishing a right to emissions and to send clear price signals to participating units from the very start of the scheme. To defray the cost of buying permits, auction revenues can be rebated to plants based on a fixed capacity rule.

"Emissions trading requires highly accurate monitoring verification of industrial emissions"

A price ceiling can stabilize the permit market

A price ceiling is a maximum allowable permit price. The price ceiling level is intended to be high enough to deter industries from purchasing at the ceiling price as a primary means of abatement yet low enough that, should the price reach this level, abatement costs would not induce financial distress or non-compliance at heavily emitting units.

Compliance penalties fixed at a multiple of the permit price support permit demand

Excess emissions during the compliance period, beyond permit holdings at the end of the true-up period, shall result in a fine of twice the permit price for compliance purposes for every unit of emissions. This indexed penalty will induce industries to purchase permits for any level of the permit price.

Implementation

Standardize and mandate CEMS

Regulators should mandate the use of standardized CEMS in all participating plants.

Establish the regulatory structure for ensuring compliance

Regulators should issue a Notification, consistent with the market design and Indian environmental law, that establishes the regulatory authority for regulating total emissions at the level of the industrial cluster and imposing financial penalties for excess emissions.

Solicit private expertise to help implement the emissions market

While the responsibility for ensuring compliance with the regulation remains with

the regulator, private companies such as financial or commodity exchanges may help in conducting permit auctions and providing a platform for permit trade.

Dissemination and Further Readings

As this research is being conducted jointly with the relevant policy-makers in India the main policy audience for the study will receive the results directly. Therefore no intervention from IGC is needed in this case. For further reading on the potential for applying market-based environmental regulation in India we recommend the concept note for this project commissioned by the MoEF:

Duflo, E., M. Greenstone, R. Pande and N. Ryan (2010). Towards an Emissions Trading Scheme for Air Pollutants. Available at http://moef.nic.in/downloads/public-information/towards-an-emissions-trading- scheme-for-air-pollutants.pdf

About the authors

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