



## The impacts inherent in destination-based carbon pricing: An Indian case study

### 1. *Submitting organization:*

European Roundtable on Climate Change and Sustainable Transition

### 2. *Short description of the study:*

The issue of quantifying the impacts of the implementation of response measures has been well studied. But there has been relatively little analytical attention paid to dynamic analysis that takes into account the adaptive response of the impacted countries.

In this study we will use Computable General Equilibrium (CGE) modelling to assess the impacts/incentives involved for a large complex developing economy (India) when faced with destination-based carbon pricing from key developed country markets, under four potential scenarios:

- Status quo: Key developed economies implement destination-based carbon pricing. GHG intensities of covered sectors emissions fall in line with meeting 50% of their NDCs.
- Last mover: Key developed economies implement destination-based carbon pricing. GHG intensities of covered products fall in all countries such that they reach their NDCs but the GHG intensities of covered sectors in India fall in line with meeting 50% of their NDCs.
- First mover: Key developed economies implement destination-based carbon pricing. GHG intensities of covered sectors fall in line with a trajectory that sees India achieving its NDC. The GHG intensity of other countries' covered sectors only falls in line with meeting 50% of their NDC.
- Global action: Key developed economies implement destination-based carbon pricing. GHG intensities of covered products fall in all countries such that they reach their NDCs.

Our hypothesis is that while response measures such as destination-based carbon pricing would have significant economic and social impacts for developing country exporters such as India, there are also important incentives for those exporters to achieve decarbonization in a world where such response measures become more widespread.

Note that such a finding would not imply a negation of the principle of common but differentiated responsibility and respective capabilities (CBDR-RC); it says nothing about what sort of assistance India should receive from developed countries to facilitate the adaptive changes we model, and makes no judgement about whether response measures such as destination-based carbon pricing do or do not accord with CBDR-RC.

Methodology:

The study will use a global CGE model that is based on the GTAP-power database and employs GTAP-E based GHG intensities.

The baseline case is India's value of exports in our chosen covered sectors

Covered sectors: Iron & Steel: basic production and casting, Non-Ferrous Metals: production and casting of copper, aluminium, zinc, lead, gold, and silver, Petroleum & Coke: manufacture of coke and refined petroleum products, Manufacture of chemicals and chemical products, Paper & paper products.

All three scenarios involve a tax on embedded carbon imposed in the US, the EU, the UK, Canada, Australia and Japan.



For all scenarios we assess impacts (based on loss of export value relative to baseline) at various years: 2030, 2040, 2050.

Status quo: India's and other developing countries change their GHG intensity of production in covered sectors in line with achieving 50% of their NDC in 2050-60.

First mover: India's GHG intensity of production improves more rapidly – in line with its NDCs such that those sectors achieve net-zero by 2060, or as specified in India's NDC for the national achievement. We assume a straight line reduction over time, and that net zero means residual emissions at X% of current levels – e.g., 15%. Other countries change their GHG intensity of production in line with achieving 50% of their NDC.

Global action: Similar to the first mover scenario, but the GHG intensity of production of all major exporters in these sectors (developed and developing) also improves by a specified rate. The detailed rate remains to be specified, e.g., could be sufficient to achieve net zero by 2050, or could have 2050 for developed and 2060 for developing.

Last mover: India as status quo scenario and rest of countries as global action.

**3. *Geographical Region:***

India

**4. *Area of climate policy:***

Fiscal policy;

**5. *Short description of the policy(ies):***

The policy/policies the study will cover are destination-based carbon pricing systems, meaning trade-related measures that apply a carbon price or tax on imported goods. An increasing number of developed countries are implementing or contemplating these types of measures (European Union, Canada, Australia, United Kingdom, United States).

The carbon price is placed on imported goods in certain carbon and trade intensive sectors based on the carbon content of the good. On the one hand, this can place an economic burden on developing countries dependent on trade with the countries that implement destination-based carbon pricing. On the other hand, it can incentivize a decrease in carbon intensity in certain sectors. Depending on the response of the country influenced by the trade policy, the impact of the policy will vary.

**6. *Work programme Area to be covered by the Study:***

Assessment and analysis of the impacts of the implementation of response measures (with a view to understanding the positive and negative impacts);

**7. *If the case study will cover assessment and analysis of the impacts of the implementation of response measures, the impacts to be studied:***

Social; Economic; Environmental;



**8. *If the case study will cover assessment and analysis of the impacts of the implementation of response measures, the type of assessment (Qualitative/Quantitative/Both):***

Both

**9. *If the case study will cover assessment and analysis of the impacts of the implementation of response measures, the methodology or tool used for impact assessment:***

We will use a CGE model using an extended version of the GLOBE model that is based on GTAP data investigating three different scenarios.

**10. *Status of proposed case study:***

Case study has not been undertaken and will be developed in collaboration with the KCI

**11. *If the case study is completed and published, link to the case study:***

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**12. *Elaboration on how the submitter would contribute to the development of the case study:***

ERCST will develop the case study itself with own resources to be complemented by KCI support.

Human resources: Andrei Marcu, Executive Director ERCST, Aaron Cosbey, Senior expert, ERCST, Mahua Acharya, ERCST Board, Dorothee Flaig, Hohenheim University and Sara Svensson, ERCST.

Developing case study: ERCST will perform and develop the case study.

Financial recourses: ERCST will provide financial resources to the consultants and modelers.