

## **Modelling the Impact of Clean Environment Cess: Hybrid Energy Input-Output Approach**

Topic: Energy Input-Output Modeling I (Chair: Kirsten S. Wiebe, SINTEF)

Author: Rajat Verma

Co-Authors: Ganesh Sivamani

The Government of India introduced the Clean Environment Cess (CEC), to be levied on the total sales (including imports and exports) of all types of coal in India, in 2010 to reduce emissions and tackle climate change. This paper seeks to measure the impact of this cess on greenhouse gas (GHG) emissions and the gross domestic product (GDP) at both the sectoral and national levels. It examines these questions by modelling the impact of the CEC using a hybrid Energy Input-Output (EIO) framework. The EIO for India for 2015-16, published by the Centre for Social and Economic Progress (CSEP), is the major data source for this study. The rate of the CEC was Rs 200/tonne in 2015-16. It was increased to Rs 400/tonne in 2016-17. However, the actual collection rate of this levy was Rs 144/tonne and Rs 324/tonne, respectively. This increase of Rs 180/tonne in the actual tax levied resulted in around 0.09% reduction in the GDP, while emissions from coal and petroleum products reduced by only 0.96% and 0.13%, respectively. The sector most affected by this cess was the coal electricity sector, with a potential reduction of around 1.5% in its proportion of gross value added. This was followed by a 0.47-1.2% reduction in the proportion of gross value added of the coal and lignite, cement, crude petroleum, and iron and steel sectors. The reduction in emissions across sectors also followed the same order, as the decrease in output led to lesser emissions. Thus, the CEC alone is not a useful tool for meeting India's climate change targets. However, a similar cess on the production of other high-emitting sectors such as fertilisers, iron and steel, non-ferrous basic metals, paper and paper products, and textile and leather may help.