Fossil Taxes Funding India's Decarbonisation: An Impact Analysis

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Independence | Integrity | Impact

Context

- India's green transition requires Domestic Climate Finance (DCF)
- Revenues from fossil fuel taxes- an **important source of climate finance**
- **Fossil fuels taxes:**
  - **Coal**
    - GST compensation cess was a major contributor
    - GST 2.0 replaced GST compensation cess with higher GST (from 5% to 18%)
  - **Oil and natural gas**
    - Revenues account for 1/3rd of the total indirect tax revenue
    - Major contributor- excise duty and VAT

Context Cont'd...

- **Major Emitters- Electricity and Hard-to-abate (HTA) sectors** (Iron and Steel, Aluminium, and Cement)
  - Contribute to more than half of the total emissions in India (MoEFCC, 2024)
  - Important to decarbonise
- **Utilising fossil fuel taxes**
  - For technological advancements in HTA sectors and renewable energy investments
  - Would have socio-economic implications

Research Objectives and Identified Questions

S. No.	Objectives	Questions	Methods
1	Identification of technological improvements for various hard-to-abate sectors	1. What technological improvements are required to decarbonise hard-to-abate sectors, especially CBAM sectors? 2. How much would these technological improvements cost, and their potential environmental benefits?	Secondary Literature
2	To simulate the impacts of utilising fossil fuel taxes for investing in enhancing technological improvements and/or renewable energy	1. What would be the distributional implications of utilising some part of existing fossil fuels tax revenues for financing (a) enhancing technological improvements, (b) renewable energy projects?	ESAM modelling

Data

1. **Investment Requirements**

- Elango et al. (2023), Nitturu et al. (2023) and Sripathy et al. (2024)
  - Estimates on investment requirements for decarbonising Iron and Steel, Cement and Aluminium
  - Estimates potential reduction in carbon emissions and energy consumption
- CEA (2022)- investment requirements for the transmission system for integration of 500 GW of RE Capacity by 2030

2. **Simulations: ESAM Database**

- **CSEP-ESAM** for India for 2019–20: comprises **45 production sectors**, including HTA sectors, thermal and renewable electricity
- **Socio-economic implications**- assessed through **impacts on households' income**
- **Environmental impacts-** assessed using the sectoral emissions in the ESAM

Methodology

1. Investment Requirements

- **Computing environmental benefits**: investment requirements, possible energy and emissions reduction and a linear approach
- **Allocation of Rs 75,166 crore:** Rs 16,949 crore sourced from the GST, and Rs 58,217 crore from oil and natural gas (ONG) taxes (around 8.7% of the total tax revenues from ONG)

2. Simulating the Implications

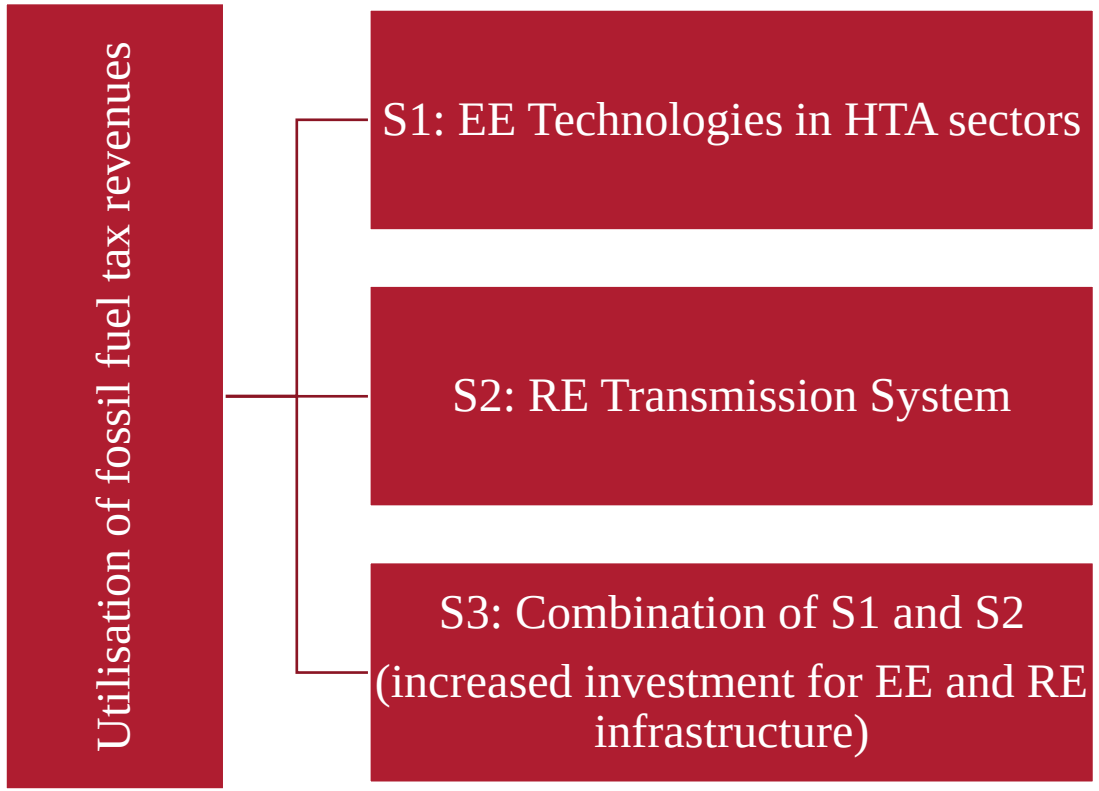
- The effect of an exogenous shock in final demand (increase in investments) on sectoral output is estimated using the equation below:

$$\Delta \boldsymbol{Y} = (\boldsymbol{I} - \boldsymbol{A})^{-1} \Delta \boldsymbol{X}$$

- The impact on the emissions is estimated as:

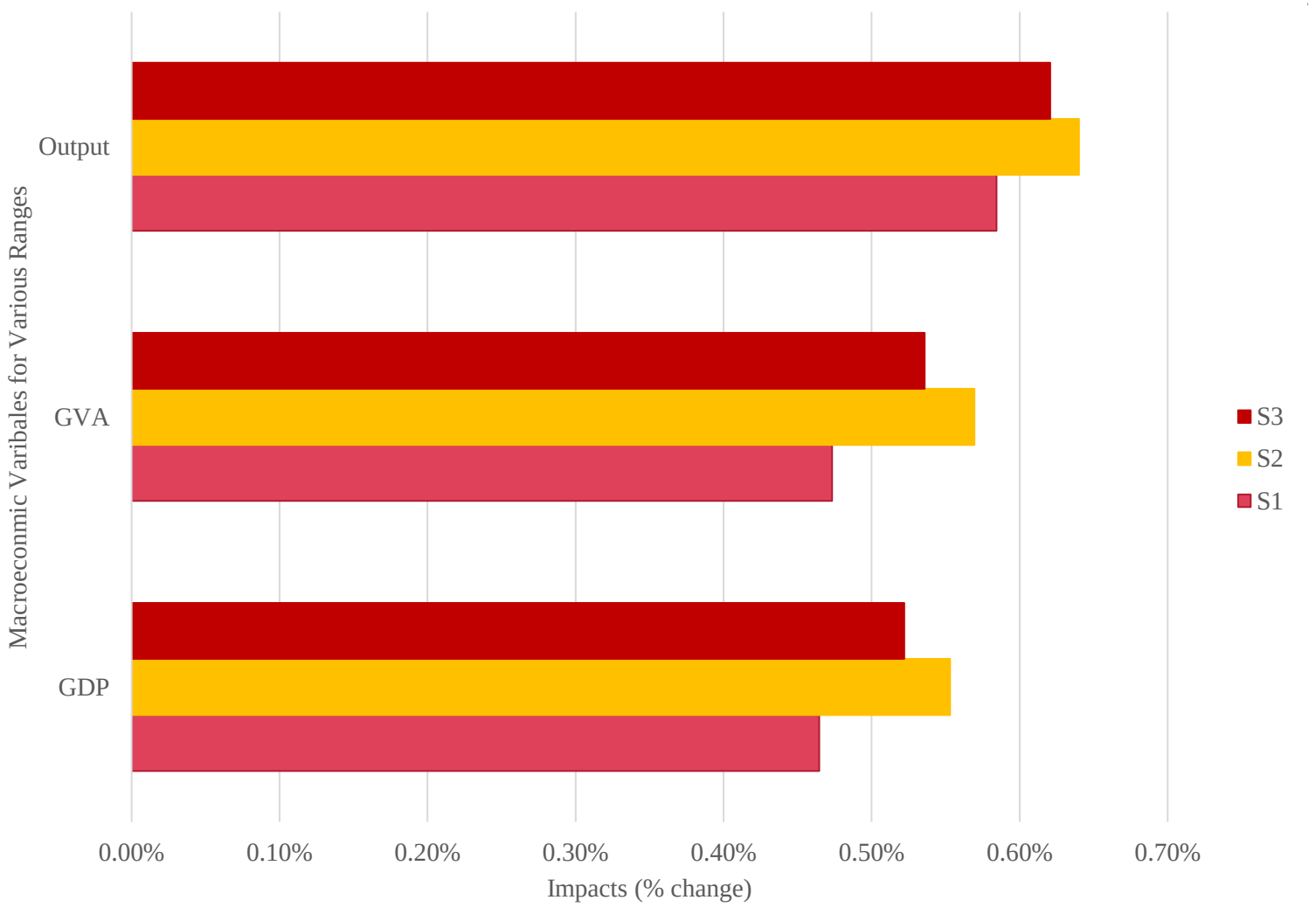
$$\boldsymbol{Emissions_{new}} = \boldsymbol{Emission\ Coefficient} * \boldsymbol{Output_{new}}$$

Simulations Scenarios



Impacts on Economy–Results and Analysis

- **Utilisation of fossil fuel taxes** for investing in mitigation technologies & RE has a potential positive economic impact
- **Increased investment for decarbonisation measures** creates an expansionary effect in the economy
- **Impact is highest in S2,** followed by S3 and S1- **in line with changes in the value added**



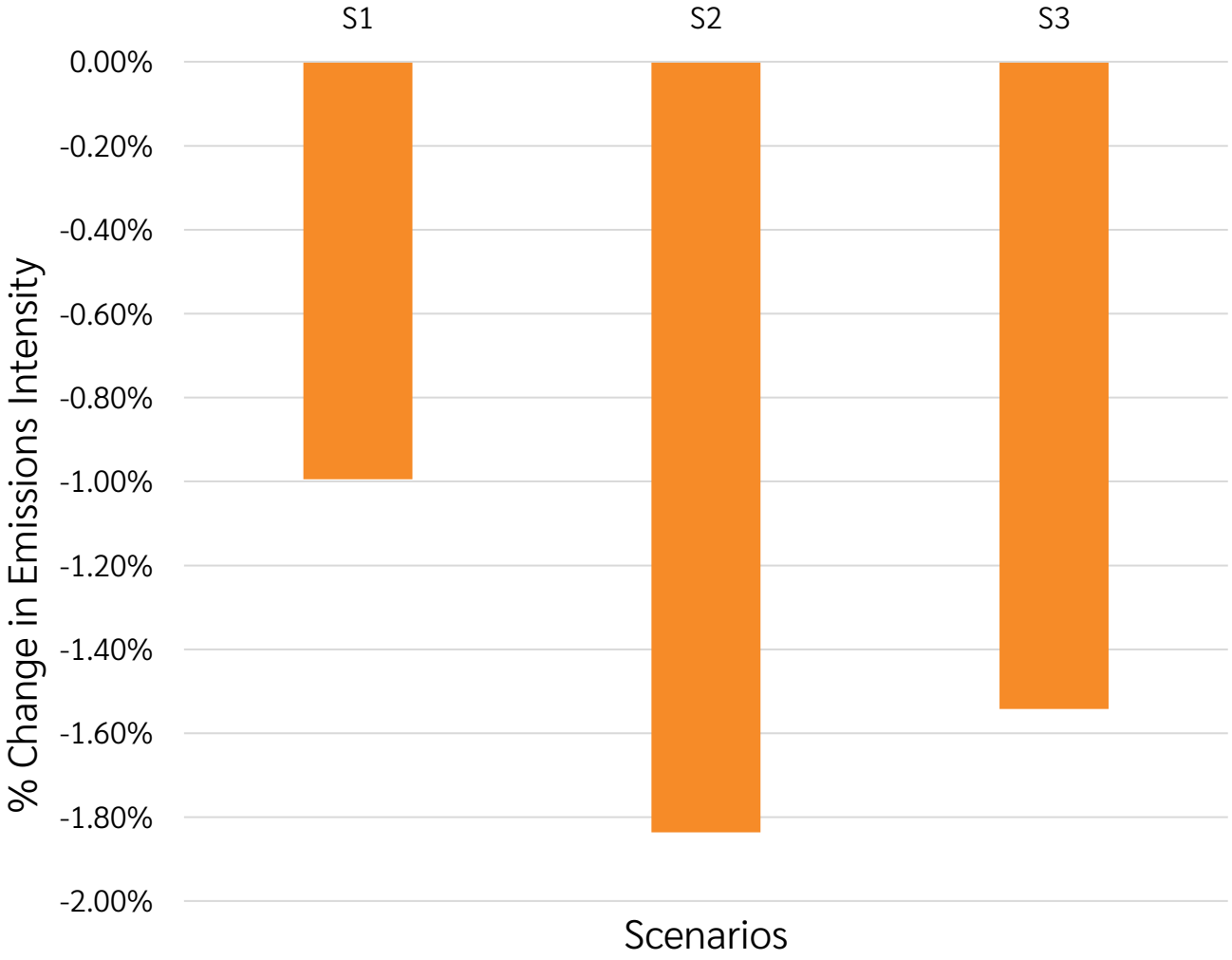
Source: Authors' computations

Impacts on 5 sectors contributing most to Production activity

ESAM Sectors	% change in Output		
	S1	S2	S3
Commerce and Public Services	0.41	0.51	0.47
Construction	0.1	0.57	0.4
Machinery	3.56	2.56	2.91
Agriculture	0.41	0.5	0.47
Food and Beverages	0.39	0.48	0.45

Note: In 2019-20, these five sectors accounted for around 60% of total production activity in the country.
Source: Authors' computations

Impacts on Emissions Intensity–Results and Analysis



- **Reduction in emissions intensity- highest in the S2**, followed by S3, S1- in line with reduction in total emissions

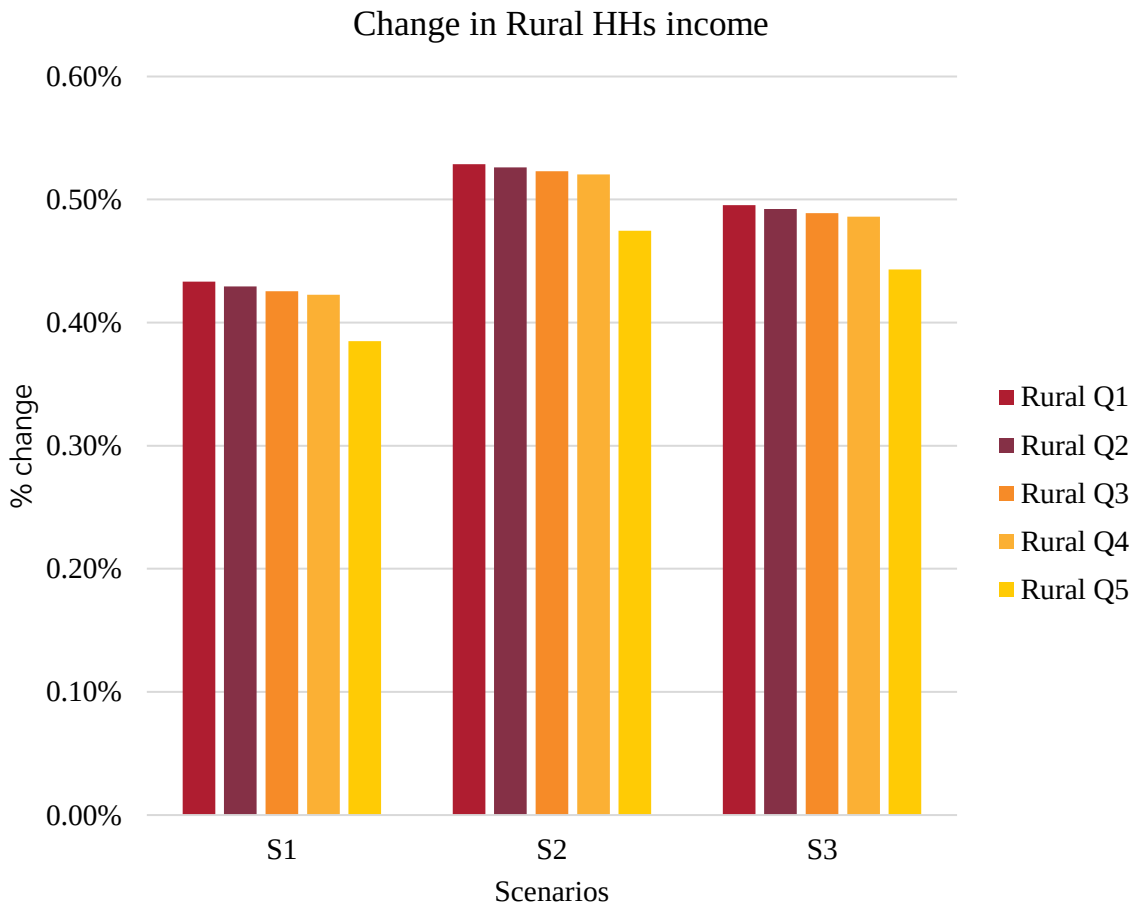
- Greening the grid is expected to reduce emissions the most, as almost **40% of emissions are from electricity production** (BUR 4)

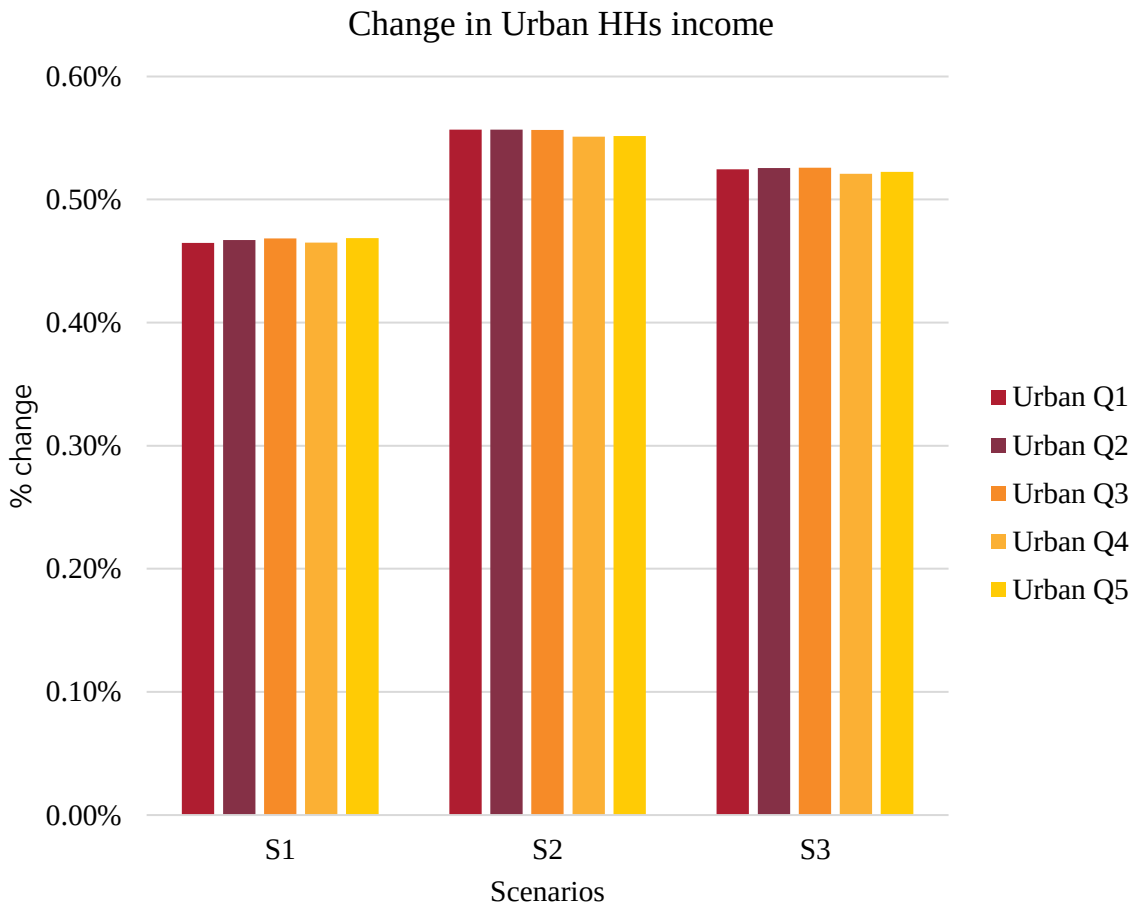
Source: Authors' computations

Impacts on Households–Results and Analysis

- **Rise in demand for factors of production:**
  - Because of increased output and constant factor productivity,
  - **Increases households' income**-owners of factors of production
- Increase is **highest in S2**, followed by S3 and S1
- **In rural regions, increase in income is highest for lower-income quintiles** compared to higher quintiles- progressive income impact
- **In urban regions- only S2 has some progressive impact**, regressive otherwise

Impacts on Households





Source: Authors' computations

Conclusions

- Mobilising resources domestically for climate actions is a necessity
- **Fossil fuel tax revenue:** a small part can finance investment requirements for technological advancements and the RE transmission system
- **Potential positive impact on economy, environment, and households' welfare- highest in S2**, followed by S3 and S1
- Utilising fossil fuel taxes for technological upgradation and greening the grid can boost the socio-economic conditions and reduce emission intensity

Policy Recommendations

- **Leverage fossil fuel tax revenues:**
  - Allocate a part of Special Additional Excise Duty (SAED) and Road & Infrastructure Cess (on petrol and diesel) towards climate finance
  - Allocate additional GST collected toward financing the decarbonisation measures
  - These levies already generate large revenues; earmarking a small share avoids introducing new taxes.

Thank You