

## A Policy Note

# Need of Carbon Tax in India for Decoupling Economic Growth (GDP) from GHG Emissions



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**About Project:**

**Assessing the Feasibility of Instituting an inclusive Carbon Tax Policy in India**

The project intends to build a holistic understanding of the need for, and the trade-offs associated with instituting a Carbon Tax in India. This policy note presented under the output will assist in providing directional analysis on the possible impact of a Carbon Tax on greening the economic growth and thereby help in developing a holistic understanding about the need.



## Context

Climate change is no longer a subject of debate. Its damaging and irreversible effects are globally evident: from raging forest fires to severe weather phenomena. Scientific consensus underscores the critical need to limit global temperature rise to 1.5 degrees Celsius or 2.7 degrees Fahrenheit. This goal necessitates halving greenhouse gas (GHG) emissions represented as Carbon Dioxide equivalent (CO<sub>2</sub>e) by 2030 and reaching net-zero carbon dioxide (CO<sub>2</sub>) emissions by mid-century<sup>1</sup>.

Since the dawn of the industrial age, fossil fuels have been a key enabler of economic development, providing fuel for most of the world's electricity, powering automobiles, water transport systems, and aircraft, and fuelling industrial activity. As a result, economic growth has been closely tied to a rise in greenhouse gas emissions through most of modern economic history<sup>2</sup>.

India currently stands third among the world's highest GHG emitters. India's resolve to fight the climate crisis has been outlined in its Nationally Determined Contribution (NDC), which states its plan to reduce GHG emissions. By 2030, India hopes to bring down its emissions intensity to 45 per cent of its 2005 levels. This was declared in an updated version of the NDC released in August 2022, along with the revised targets for electrical power capacity from non-fossil fuels<sup>3</sup>.

India has achieved significant progress in reducing its emissions intensity, with a 33 per cent decline from 2005 to 2019, transitioning from a 1.5 per cent average annual reduction in the 2014-2016 period to 3 per cent in 2016-2019. This marks a decoupling of emissions from GDP growth, surpassing its initial NDC goal of a 33 per cent reduction by 2030, and setting a more ambitious target of 45 per cent reduction.

Despite these achievements, the current pace may not suffice to significantly alter India's emissions trajectory, considering its anticipated rapid economic growth. India exceeded its NDC clean energy target, achieving a 43.1 per cent share in non-fossil fuel power capacity and aims for 50 per cent by 2030. However, coal still dominated 73 per cent of its electricity generation in 2022-23<sup>4</sup>. Despite the reduction in carbon intensity to GDP ratio seen over the last decade, the yearly CO<sub>2</sub>e emissions will potentially escalate to 11.8 GtCO<sub>2</sub>e by 2070. This is because the India's annual real GDP is expected to grow at 5 per cent, leading to a four-fold increase in GDP growth by 2050<sup>5</sup>.

Financing the shift to clean energy transition is paramount, necessitating taxation policies that can foster investments in renewable energy. However, the transition poses fiscal challenges, given the country's reliance on energy taxes from sources like petroleum and coal, which accounted for 3.4 per cent of its GDP and 17.8 per cent of total revenue from 2017-18 to

2021-22. With the anticipated shift towards clean energy and the consequent expected decrease in fossil fuel revenues, which in FY 2021-22 constituted 17.9 per cent of total revenue and 3.5 per cent of the GDP, there is an urgent need to explore alternative revenue streams. The International Institute for Sustainable Development (IISD) projects a potential shortfall of USD\$178 billion in fossil fuel tax revenue by 2050 for India<sup>6</sup>, highlighting the urgency to adapt its strategies and encourage green financing mechanisms to support renewable energy development and mitigate the fiscal impacts of transitioning away from non-renewable sectors.

Introducing carbon pricing mechanisms such as taxation on emissions is essential for decoupling GDP growth from CO<sub>2</sub>e emissions, as evidenced by the international acceptance and success of carbon taxes in 28 countries as of March 2023. The International Monetary Fund (IMF) recommends a carbon price floor of USD\$25 per ton for India, suggesting a progressive increase over time<sup>7</sup>.

Another study indicates that to achieve global carbon reduction targets, a tax of USD\$60.4 per metric ton of carbon dioxide is necessary. This not only discourages fossil fuel utilisation but also raises funds for universal electricity access and investments in clean energy initiatives, ultimately transforming the energy composition of the economy<sup>8</sup>.

Globally, the shift in the relationship between GDP growth and CO<sub>2</sub>e emissions represents a crucial change, driven by energy efficiency and clean energy advances. To achieve global climate goals, a complete decoupling is necessary, necessitating increased clean energy investments, international collaboration, and supportive policies, as highlighted by the World Energy Outlook<sup>9</sup>. Under the current and projected policy landscape, along with anticipated technology developments, emissions are expected to initially rise before declining to 1.9 GtCO<sub>2</sub>e annually by 2070, marking a 90 per cent decrease in emissions intensity relative to 2019 levels (1.5 kgCO<sub>2</sub>e/USD\$ per annum). Adopting more aggressive measures, such as implementing carbon pricing under an accelerated scenario, could narrow the gap towards net zero even further, bringing down absolute emissions to 0.4 GtCO<sub>2</sub>e<sup>10</sup>.

This policy note highlights various information and insights from the prevailing economic landscape and suggests measures to decouple economic growth from CO<sub>2</sub>e emissions. It presents data gathered from government sources on how much the GDP relies on taxes from fossil fuels, along with information on public aid and subsidies for both fossil fuel and renewable energy programmes. It attempts to conduct a critical analysis of resource supply streams (mobilisation) through taxation policy to achieve the NDC target on renewable and electric mobility. It provides notes for an alternative policy of taxing CO<sub>2</sub>e emissions such as carbon tax for the green growth of the economy. The note summarises the possible opportunities offered by Carbon Tax Policy for reducing carbon intensity of GDP.



# 1. Urgency for increasing financial resources through own tax revenues

## 1.1 Reaching NDC targets by 2030 requires resource mobilisation

India has made considerable strides towards being a net-zero economy over the last few years. This is evident by the increased capacities in the energy and the mobility sectors. As seen in the above sections, India's budgetary impetus on renewable energy has shown consistent positive trends. As per India's first NDC, submitted in 2015, the country targeted an emission intensity reduction of 33-35 per cent over 2005 levels by the year 2030. By the same year, India hopes to increase the share of non-fossil fuel electricity (cumulative installed capacity) of about 40 per cent.

Despite these efforts materialising into avenues of climate change mitigation, the gap between resources required and the estimated needs of climate financing is quite high. The Reserve Bank of India's report on Currency and Finance (RCF) for 2022-23 suggests that the country's goal of achieving the net zero target by 2070 would require an accelerated reduction in the energy intensity of GDP by around 5 per cent annually. It also reports that India's green financing requirement should be at least 2.5 per cent of GDP annually till 2030, basing the figure on projected estimates from multiple organisations<sup>11</sup>.

Table 1: Projected estimates of green finance requirements

| Organisation   | Emissions reduction target  | Estimated annual outlay   |
|--|---|---|
| Climate Policy Initiative, 2022  | Till 2030 for NDC   | USD\$ 170 billion till 2030   |
| International Energy Agency, 2022  | To reach net zero emissions by 2070 on average between now and 2030 | USD\$ 160 billion   |
| Council on Energy, Environment and Water-Center for Energy Finance, 2021 | To achieve net-zero carbon emission by 2070                         | USD\$ 202 billion   |
| Mc Collum et al., 2018   | Below 1.5 degree Celsius from 2016-2050                             | USD\$ 288 billion   |
| Mc Kinsey, 2022  | Net zero emission by 2070   | USD\$ 44 billion increased by 3.5 times by 2030 and by 10 times by 2040 |

Source: Reserve Bank of India's Report on Currency and Finance (RCF) for 2022-23

Both renewable energy and electric vehicle (EV) mobility sectors will need extensive climate financing. The Parliamentary Standing Committee, 2022, noted that there is a huge gap between the required and actual investment for renewable energy capacity addition. Against the required annual investment of Rs 1.5-2 lakh crore, the actual annual investment in the last few years was Rs 75,000 crore. The Committee recommended to the Ministry of New and Renewable Energy that it find alternative financing mechanisms<sup>12</sup>.

According to estimates by Moody's, achieving India's renewable energy targets will require an investment of between 225 and 250 billion US dollars. This amounts to an average of around Rs 1.9 lakh crore annually<sup>13</sup>. Furthermore, India's transition to EVs is projected to entail significant capital expenditures. From 2020 to 2030, the total cost, including expenses for batteries, charging stations, and automobiles, is expected to reach Rs 19.7 lakh crore. By 2030, the annual financing market for EVs is forecasted to be approximately Rs 3.7 lakh crore<sup>14</sup>.

A study analysing the revenue potential of a carbon tax revealed that a levy of USD\$35 per ton of CO<sub>2</sub> emissions between 2017 and 2030 could generate more than 2 per cent of the GDP and make up for the loss from taxing fossil fuels (about Rs 5.5 lakh crore for FY20)<sup>15</sup>. The revenue from carbon taxation could bridge the climate financing gap and offer a strategic alternative to mitigate the fiscal challenges associated with reducing fossil fuel dependency.

## 1.2 Continued public financing push is critical for climate financing

In an array of projected climate finance estimates, the pivotal role of public financing has prominently been highlighted. The cumulative total expenditure for adapting to climate change in India is estimated to be Rs 85.6 lakh crore (at 2011-12 prices) by the year 2030<sup>16</sup>. According to another study by Climate Policy Initiative, in the fiscal year 2019-2020, monitored green finance amounted to Rs 3.09 lakh crores (approximately USD 44 billion) annually, and the public expenditure by the government accounted for 51 per cent of tracked climate finance for 2019-2020<sup>17</sup>. The substantial portion of public expenditure is crucial for supporting other climate initiatives, including climate adaptation and financing for loss and damage through new policies.

Globally, new fiscal instruments like carbon taxation are proving promising in mobilising resources for climate spending. A study by the IMF suggests that a USD\$70 carbon tax in India can generate revenues equivalent to 3.5 per cent GDP and lower emissions by 42 per cent. So, carbon taxation is not only capable of providing alternative fiscal pathways but also steadily helps in aiding CO<sub>2</sub> reduction<sup>18</sup>. This indicates that carbon taxation can be a viable mid-term fiscal policy to generate public funds to meet India's growing need for climate finance.



## 2. Current revenue resources increasing carbon intensity of GDP

### 2.1 Economic growth (GDP) and CO<sub>2</sub> emissions

In 2021, global CO<sub>2</sub> emissions from fuel combustion surged 6 per cent, surpassing pre-Covid-19 pandemic levels. In India, emissions grew 12.1 per cent. In 2022, CO<sub>2</sub>e emissions stood at 53.8 Gt CO<sub>2</sub>e, which is 1.4 per cent higher than 2021. As of 2022, India ranks third among the top emitters, contributing 7.3 per cent to total global GHG (CO<sub>2</sub>e) emissions. In 2022, China, the United States, and India all saw an increase in their emissions compared to 2021, with India experiencing the largest relative increase. Specifically, India's emissions rose 12.1 per cent in 2021 from the 2020 levels and 5 per cent in 2022 over the 2021 levels<sup>19</sup>.

In 2022, approximately 68 per cent of India's total GHG (CO<sub>2</sub>e) emissions were attributed to CO<sub>2</sub>. The energy sector was the primary source of India's economy-wide emissions, accounting for 49 per cent of the nation's total CO<sub>2</sub>e emissions. As of May 2023, fossil fuels made up 56.8 per cent of India's total installed generation capacity, with coal playing a substantial role<sup>20</sup>. By June 2023, coal-based thermal power alone met 72.82 per cent of India's energy needs<sup>21</sup>.

India has witnessed substantial economic expansion over recent decades, ascending to the status of the world's fifth-largest economy. Fossil fuels have been a cornerstone in India's economic progress, consistently contributing approximately 90 per cent to the energy mix from 1970 to 2021<sup>22</sup>. This economic advancement has been intrinsically linked with a rise in carbon dioxide emissions (CO<sub>2</sub>e) and energy consumption, fuelling the perspective that economic prosperity comes at the cost of environmental degradation and climate impact. Analysis of the data reveals a high correlation coefficient (+0.95), indicating a strong link between GDP growth and CO<sub>2</sub>e emissions. However, it is noteworthy that between 2011 and 2022, India's GDP grew at a compound annual growth rate (CAGR) of nearly 10.2 per cent, while CO<sub>2</sub>e emissions increased at a CAGR of about 2.2 per cent. This suggests that though the CO<sub>2</sub>e emissions and GDP have started to delink from each other, it is ideal for the two factors to be severed entirely.

Table 2: CO<sub>2</sub>e emissions and Gross Domestic Product

| Year | CO <sub>2</sub> e Emission (Mton CO <sub>2</sub> e q) | Gross Domestic Product (Rs lakh crore) |
|------|---|--|
| 2011 | 2966  | 87                                     |
| 2012 | 3144  | 99                                     |
| 2013 | 3183  | 112                                    |
| 2014 | 3358  | 125                                    |
| 2015 | 3390  | 138                                    |
| 2016 | 3443  | 154                                    |
| 2017 | 3590  | 171                                    |
| 2018 | 3755  | 189                                    |
| 2019 | 3731  | 201                                    |
| 2020 | 3519  | 198                                    |
| 2021 | 3755  | 235                                    |
| 2022 | 3943  | 272                                    |

Source: Authors' calculations based on the European Commission's Emissions Database for Global Atmospheric Research (EDGAR) and India's Union Budget  
 Note: GHG data sourced from Report: GHG emissions of all world countries (2023), Available at: [https://edgar.jrc.ec.europa.eu/report\\_2023?vis=ghgtot#emissions\\_table](https://edgar.jrc.ec.europa.eu/report_2023?vis=ghgtot#emissions_table)

Despite the considerable growth and early achievement of NDC targets, the share of renewables in India's total energy mix is still stagnant at 17.28 per cent, while thermal power continues to dominate at 79.5 per cent<sup>23</sup>. Since hydropower generation has not kept up with the rising demand for electricity, and the share of coal in fuelling industrial energy demand has more than doubled over the decade, there is a need for coercive fiscal policy through instruments like carbon taxation and disciplining the patterns of consumption and production.

This involves tackling inefficient government spending that incentivises fossil fuel use consumption, reducing subsidies for fossil fuels, clarifying policy directions, discouraging the expansion of coal-based electricity production, and addressing the surge in energy consumption by industries. These areas demand more stringent oversight and reform.

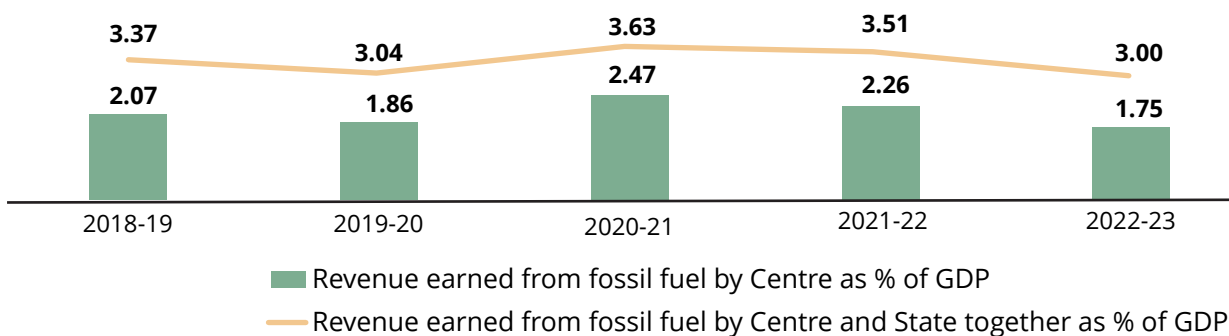


## 2.2 Share of fossil fuel taxes in GDP

India's GDP and fiscal health have always been heavily reliant on tax revenues from fossil fuels, representing a significant share of the country's total income and contributing notably to its GDP. This dependence on fossil fuel taxation, while substantial, underscores the critical need for diversification of financial resources to reduce emissions and support the transition to non-fossil-based energy sources. Fossil fuels significantly augment the government's revenue, predominantly through the consumption of petroleum products, which contributed to over 90 per cent of fossil fuel income (Coal India and Petroleum Sector) from FY 2018-19 to FY 2022-23. Despite coal's smaller revenue share, fossil fuel consumption remains a key revenue generator, with around 87 per cent of total fossil fuel revenues stemming from consumption.

Fiscal contributions from fossil fuels to the Union government's coffers have fluctuated, comprising 2.07 per cent of India's GDP in FY 2018-19, peaking at 2.47 per cent in 2020-21, and then decreasing to 1.75 per cent in 2022-23. Fossil fuel revenues from both the Union and State governments combined on average accounted for 3.29 per cent of the GDP between FY 2018-19 and FY 2022-23, emphasising their substantial fiscal role and accounting for significant portions of government budgetary expenditures.

Figure 1: Revenue Generation through Fossil Fuels



Source: Reserve Bank of India's Report on Currency and Finance (RCF) for 2022-23

## 2.3 Surcharges and cess envelope versus fossil fuel-based surcharges

The Government of India (GoI) has the distinct authority to impose cesses and surcharges for specific purposes, such as funding road and infrastructure projects or supporting health and education sectors through levies on petroleum products. This mechanism, constitutionally sanctioned, has gradually evolved from temporary to permanent fixtures in India's tax landscape, significantly bolstering the Centre's net tax revenue by retaining these funds outside the divisible pool shared with states. This evolution reflects a trend towards greater centralisation of tax revenues, despite the 14<sup>th</sup> Finance Commission's recommendations aimed at enhancing the fiscal share of States<sup>24</sup>.

From 2018-19 to 2022-23, cesses and surcharges on Motor Spirit and High-Speed Diesel Oil averaged 9 per cent of the Gross Tax Revenue, peaking at an all-time high of 15 per cent in FY 2020-21. Moreover, during the same period, the petroleum sector contributed to over 60 per cent of the total cesses and surcharges collected by the Government of India (GoI) on average.



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### 3. Budgetary resource allocations is not aligned with climate targets

#### 3.1 Continued Budgetary allocation for ministries supporting fossil fuels

Budget analysis shows that funding for fossil fuels, including coal and petroleum, through Gross Budgetary Support (GBS) and Internal and Extra Budgetary Resources (IEBR)<sup>1</sup>, amounted to Rs 1.49 lakh crore in FY 2018-19, as detailed in Table 3. This figure rose to Rs 1.73 lakh crore for the Ministry of Coal (MoC) and the Ministry of Petroleum and Natural Gas (MoPNG) in subsequent years. On average, petroleum received the lion's share of these allocations, constituting 88 per cent of the total fossil fuel funding between FY 2018-19 and FY 2022-23.

Between FY 2018-19 and FY 2022-23, allocations for coal and petroleum have risen by 43 per cent and 13 per cent, respectively. This trend underlines the government's dedication to financing the energy sector, which significantly boosts government revenues. Given India's goal to achieve 50 per cent of its energy production from non-fossil fuel sources by 2030, the substantial increase in coal and petroleum is counterproductive. Therefore, it is imperative to consider alternative policies aimed at reducing fossil fuel subsidies to align with India's renewable energy objectives.

**Table 3: Budgetary allocations for the Ministry of Coal and Ministry of Petroleum and Natural Gas (in Rs crore)**

| Year        | Ministry of Coal (MoC) |                   |        | Ministry of Petroleum and Natural Gas (MoPNG) |                   |          |
|-------------|------------------------|-------------------|--------|---|-------------------|----------|
|             | IEBR                   | Budget Allocation | Total  | IEBR  | Budget Allocation | Total    |
| 2018-19(A)  | 15,749                 | 708               | 16,458 | 1,00,309                                      | 32,371            | 1,32,680 |
| 2019-20(A)  | 14,871                 | 823               | 15,694 | 1,05,603                                      | 42,812            | 1,48,415 |
| 2020-21(A)  | 17,475                 | 572               | 18,047 | 1,11,194                                      | 42,190            | 1,53,384 |
| 2021-22(A)  | 19,656                 | 574               | 20,230 | 1,06,686                                      | 5,754             | 1,12,440 |
| 2022-23 (A) | 23,400                 | 103               | 23,504 | 1,19,011                                      | 30,913            | 1,49,924 |

Source: Calculated by CBGA based on Union Budget documents for various years

<sup>1</sup> These resources are raised by PSUs through profits, loans, and equity.

### 3.2 Budgetary allocation for renewable energy

The government has proposed several measures to support the country's transition to a low-carbon economy through the promotion of clean energy, besides an increase in GBS to the Ministry of New and Renewable Energy (MNRE). The IEBR support for the Indian Renewable Energy Development Agency (IREDA), the primary PSU tasked with promoting renewable energy along with the MNRE, has been increased. Between FY 2018-19 and FY 2022-23, GBS increased by 72 per cent and IEBR rose 74 per cent.

**Table 4: Budgetary Allocations for the Ministry of New and Renewable Energy (Rs crore)**

| Year        | IEBR   | Budget Allocation | Total  |
|-------------|--------|-------------------|--------|
| 2018-19 (A) | 10,459 | 4,403             | 14,862 |
| 2019-20 (A) | 10,451 | 3,417             | 13,868 |
| 2020-21 (A) | 9,506  | 2,867             | 12,373 |
| 2021-22 (A) | 15,880 | 4,143             | 20,023 |
| 2022-23 (A) | 18,249 | 7,563             | 25,812 |

Source: Source: Calculated by CBGA based on Union Budget documents for various years

Examining the actual IEBR allocations for 2022-23 from the Ministry of Power (MoP) in the provisional budget for 2024-25 reveals there is immense support for the expansion of hydro power projects (now recognised as a renewable energy source) and various renewable energy initiatives being undertaken by Public Sector Undertakings (PSUs) such as the National Thermal Power Corporation (NTPC). These enterprises support addition of renewable energy capacity through green procurement processes, indicating green shoots in climate financing by power ministries<sup>25</sup>. Carbon tax revenue augmentation with resource mobilisation streams can reduce fiscal deficit and strengthen the domestic revenue sources for the government to support programmes related to clean energy.

Table 5: Ministry of Power IEBR Allocations (in Rs Crore)

| Investment in Public Enterprises                  | FY 2022-23 (Actual) |
|---|---------------------|
| Power System Operation Corporation Limited        | 68.32               |
| National Hydro Electric Power Corporation Limited | 6464.85             |
| Damodar Valley Corporation Limited                | 2055.37             |
| Northeastern Electric Power Corporation Limited   | 849.45              |
| Satluj Jal Vidyut Nigam Limited                   | 8239.7              |
| Tehri Hydro Development Corporation Limited       | 4615.02             |
| Power Grid Corporation of India Limited           | 8850                |
| National Thermal Power Corporation Limited        | 26241.29            |
| Total   | 57384               |

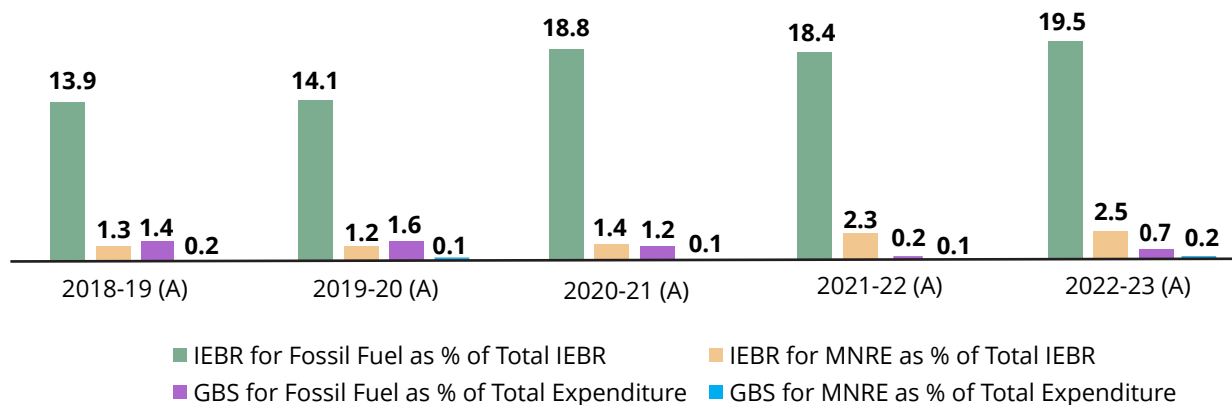
Source: Authors' compilation from Union Budget 2024-25

### 3.3 Need for recalibration of resource allocations: Fossil fuel versus non-fossil fuel

The analysis of budgetary support points to the necessity for a more balanced approach in the allocation of GBS and IEBR between fossil fuel and non-fossil fuel sectors. While there has been a significant increase in IEBR allocations towards fossil fuels, rising from 13.9 per cent in FY 2018-19 to 19.5 per cent in FY 2022-23, the allocation for the MNRE has also seen an increase, albeit more modest, from 1.3 per cent to 2.5 per cent over the same period. Despite this growth, the disparity in funding is evident, with fossil fuels receiving a substantially larger share compared to MNRE. Over the years, IEBR channels of financial support have increased considerably in comparison to GBS and such dependency needs to break apart in the longer term as the actual inflows to IEBR support various ministries, and has largely been raised as loans from multilateral development banks. Experts believe that such borrowing mechanisms might add burden to the government finances in the long term due to associated high interest rates and liabilities.<sup>26</sup>

Furthermore, the GBS analysis reveals a decline in funding for fossil fuels from 1.4 per cent of the total expenditure in FY 2018-19 to 0.7 per cent in FY 2022-23, alongside a minimal allocation of 0.2 per cent for MNRE in FY 2022-23. These figures highlight the urgent need for a strategic realignment of fiscal support, advocating for a more equitable distribution of resources that equally fosters the development of both fossil fuel and renewable energy sectors. Such a recalibrated fiscal strategy would not only address the current imbalance but also align with global sustainability targets and India's own renewable energy goals.

Figure 2: Fossil fuel and MNRE Share in IEBR and Total Union Government Budget Expenditure



Source: Authors' compilation from Union Budget documents for various years

India has strengthened its climate finance through domestic initiatives, including Sovereign Green Bonds, Production Linked Incentives for solar PV and electric mobility, and the National Green Hydrogen Mission, reflecting a commitment to sustainable energy. Financial reforms like SEBI's ESG disclosures and RBI's support for renewable projects enhance these efforts<sup>27</sup>. However, despite achieving over 150 GW of renewable capacity by December 2023, reaching the 500 GW target by 2030 demands more resources. The current increase in MNRE's budget is insufficient for the sector's needs, highlighting the necessity for greater GBS and allocations<sup>28</sup>.

Over the years, the MoP has funded several initiatives to enhance energy efficiency. Despite all these efforts, funds allocated for these initiatives are minimal. Allocations meant for improving power systems in the Northeastern States, providing interest subsidies on loans to Distribution Companies (DISCOMS) across both public and private sectors for upgrading distribution networks outside the purview of *Rajiv Gandhi Gramin Vidyutikaran Yojana (RGGVY)* and Restructured Accelerated Power Development and Reforms Programme (R-APDRP) schemes, and fostering energy efficiency across various sectors of the Indian economy. The Ministry also allocates funds for Green Energy Corridors, aimed at enhancing renewable energy generation and integration with the main grid, ensuring power system security and stability.

There is a need for recalibration of revenue resource generation based on green taxation to feed the calibrated resource mobilisation for programmatic interventions through ministries meant for encouraging non-fossil fuel-based economy or encouraging low carbon development of various sectors.



## 4. Need for fiscal discipline measures such as a carbon tax to mitigate effect of inconsistent policy signals

The current policy mechanisms through the government are largely subsidies routed to consumers and beneficiaries through grants and targeted subsidies through programmatic interventions. Most of the off-grid renewable energy programmes such as rooftop solar, standalone solar-based agriculture pumps and some premier schemes that incentivise buyers of electric vehicles are being implemented through subsidy-based mechanisms to improve uptake with consumers and beneficiaries. However, there are instances that these interventions have not met the desired results due to poor uptake of technology and inconsistent policy signals. Despite the revenue dependency and energy security needs on fossil fuels, India needs to adopt a long-term policy mechanism for the economy to shift the focus from fossil fuels towards green energy sources. Subsidies alone cannot achieve the same and without consistent policy signalling, it can end up being dependent on consumers and market subsidies. Let us take two examples, one from the market, and the other from a policy measure to understand this issue:

In 2023, a change to the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme-Phase II (FAME- II) resulted in incentives on electric two-wheelers being cut to 15 per cent of the ex-factory price from the earlier 40 per cent, and the demand incentive being reduced to Rs 10,000/kWh from Rs 15,000/kWh earlier<sup>29</sup>.

This policy change had a direct impact on the registrations of EVs. The following table indicates the number of registrations of Battery-Operated Vehicles in the country since 2019, and the corresponding percentage increase in uptake. Evidently, the increase in numbers has fallen since FAME-II was amended in 2023, with the percentage rise in registrations falling to 33.1.

**Table 6: Registrations of battery-operated vehicles (EVs) in India**

| Year | EV Registrations | Percentage Increase |
|------|------------------|---------------------|
| 2020 | 1,24,688         |                     |
| 2021 | 3,31,690         | 62.4                |
| 2022 | 10,25,200        | 67.6                |
| 2023 | 15,31,584        | 33.1                |

Source: Authors' compilation from Vehicle Registration data portal

Another area of concern is the Rooftop Solar Scheme (RTS). The country's failure to meet its 2022 renewable energy target of 175 GW was attributed to the RTS's less-than-optimal uptake. Launched in February 2019, the RTS was only able to generate a capacity of 472 MW against the targeted 3,000 MW by the end of the financial year 2019-20. Similarly, in 2022 target was not achieved for the scheme. The reasons for this situation in the RTS can be understood from the inconsistencies in the policies pertaining to various aspects such as the Domestic Content Requirement (DCR), the lack of a targeted policy for improving uptake and low subsidy for low-income households<sup>31</sup>.

This indicates that India's pathway towards net-zero targets needs a uniform policy signalling mechanism which can slowly incentivise the markets and end consumers to shift towards clean energy and sustainable solutions. India's current fiscal and policy mechanisms — dependent on fossil fuels for revenue and energy security — do not have the right signalling mechanism or an alternative to the subsidy-based encouragement towards green energy. A well-designed and inclusive carbon tax can be a possible solution to long-term policy signalling and an alternate fiscal pathway to cater to these broader issues.

The other significant challenge is the slow uptake of renewable energy generation capacity, resulting in an investment towards both clean energy and fossil fuel-based energy, as India's energy capacity remains thermal power based which is being run on coal. Despite the considerable growth in installed capacity India's renewable energy mix in total energy mix is still stagnant at 17.28 per cent, while thermal power dominates at 79.5 per cent. It is high time the progress mapping of renewable energy uptake in India is mapped with the generational capacity rather than solely through installed capacity. Carbon taxation measures can improve generation of renewable energy by instilling sustainable energy consumption and production process by industries and then supported by a cohesive fiscal policy environment with consistent policy signalling to the markets.



## 5. Conclusions and key notes

India is committed to net zero emissions by 2070. While the addition of renewable energy capacity and revised NDC targets has helped this cause, green power generation is still insignificant compared to coal-based thermal power.

Fiscal measures, particularly via taxation, have the potential to shift this pattern by promoting behaviors that align with sustainable consumption and production within the economy.

This policy note highlights how India's economy has developed over time with high dependency on fossil fuel revenues and the efforts it has made to reduce its CO<sub>2</sub> levels

through budgetary allocations. The note has highlighted various data, information, and insights from the available documents and calculations and suggests measures to decouple the economic growth from CO<sub>2</sub> emissions.

These include a presentation of collated data related to GDP dependency on fossil fuel taxes, gross budgetary support and subsidy support to various programmes related to fossil fuel and non-fossil fuel through nodal ministries. It attempts to conduct a critical analysis of resource supply streams (mobilisation) through taxation policy to achieve NDC's target on renewable and electric mobility. Some of the key conclusion and policy notes derived from these highlighted facts are as follows:

Our analysis on annual growth rate of GDP and CO<sub>2</sub> emissions pattern suggests a divergence. However, an absolute decoupling of GDP from CO<sub>2</sub> emissions is the need of the hour. While higher GDP growth can still co-exist with lower CO<sub>2</sub> emissions, **this needs to be complemented by a taxation policy to curb the increase in carbon footprint.**

Further, an analysis of budgetary allocations revealed that India needs to actively recalibrate its resource mobilisation to promote a sustainable, non-fossil fuel-based economy and combat climate change. Though fiscal support through the IEFR and the GBS to the MNRE and the MoP for climate-friendly initiatives has resulted in a decline in CO<sub>2</sub> emissions, India continues to support the most energy-intensive sectors supported by the Ministry of Coal and the Ministry of Petroleum. **As India's economy witnesses green technological development, the substitution of fossil fuels for renewable energy can be further enhanced through appropriate and coordinated resource allocations.** The revenue generated from carbon tax, which inevitably leads to the creation of new jobs in the renewable energy sector, can not only generate an economic boost, but also be used to fund finance-intensive climate mitigation measures such as renewable energy, cleaner public transport, and energy efficiency related programmes by the MNRE and the MoP.

A review of various estimates on projected finance requirements of greening the economy of India revealed that India's green financing requirement lies between USD\$ 44 billion and USD\$ 288 billion per year with a spending requirement of at least 2.5 per cent of GDP annually till 2030. Public finance is critical to enable climate financing with its 51 per cent share in total tracked green finance in India. Emerging needs related to adaptation, and loss-and-damage response financing, are further depleting the purse available for climate financing. **The widened financing gaps and budgetary constraints underscore the urgent need to adopt green taxation measures, such as implementing a carbon tax, to address these challenges.**

This note highlighted that subsidies have been one of the quintessential attributes of the government of India's fiscal policy for the promotion of clean technologies such as renewables and electric mobility. Examples of subsidy programs like RTS and FAME-II illustrate how government subsidies have been utilised to enhance scalability and lay the groundwork for



diverse economic sectors to engage in the market. Nonetheless, inconsistent policy directions within these schemes have resulted in diminishing returns and accelerated depletion of limited fiscal resources, as newer subsidies accumulate on top of existing ones. Further, higher subsidy expenditure might even push up fiscal and revenue deficits as the government starts spending only through subsidies. **Hence, actively generating additional revenue through new taxes, like the carbon tax, can bridge the fiscal gap caused by excessive subsidisation and provide a consistent policy signal to the market.**

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