THE ENERGY AND RESOURCES INSTITUTE
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National Transport Decarbonization Council (NTDC)

Concept Note

Transport and Emission: Global Context

A global ambition is to reach Net Zero Emissions (NZE) by 2050 and limit the rise in the global temperature to 1.5 degrees Celsius. Globally, the transport sector operations account for 25% of greenhouse gas emissions annually. Transport across road, rail, sea, and air generate emissions more than any other energy-consuming sector, with most emissions emanating from road transport.[1] According to the International Energy Agency (IEA), the global transport sector produced over 7.2 Gigatonne (Gt) emissions in 2020.[2] The targeted emissions for 2050 from the transport sector are around 0.7 Gt, a 90% drop with respect to 2020 levels.

Energy Consumption and Emission in India

Transport in India is among the fastest-growing and energy-intensive sectors and hence it has relevance to oil demand and direct emissions. The transport sector is responsible for 13.5% of India's energy-related CO_2 emissions. Also, India is among the five countries with the highest emissions from transport with around 300 million tonnes ($MtCO_2$) annually. Since the 1990s, a major shift has occurred towards road transport as it accounts for around 70% and 95% of the total land transport activity for freight and passengers, respectively.[3]

The transport sector in India contributed to the final energy demand of an estimated 4.3 exajoules (EJ) in 2020, almost 20% of the final energy use, which is lower than the global average of 29%.[4] Transport energy use has grown around 50% since 2010, despite the strong impacts of COVID-19.[4]

1 https://www.engineeringnetzero.com/insights/the-role-of-transport-in-net-zero/
2 Net zero by 2050. A roadmap for global energy sector by IEA
3 COP26 Chartered of Actions by TERI, 2021
4 Decarbonising India's Transport System: Charting the Way Forward, The International Transport Forum, 2021

The transport sector accounts for the largest share in terms of consumption of petroleum products—nearly 70% of diesel and 100% gasoline. In the last decade, the use of oil by India's transport sector has risen by 91% and about 90% of the total energy demand has arisen from road transport, followed by rail and air. During the last two decades, India's oil demand from the road sector has recorded the highest growth in the world. It is important to note that India's dependence on imports to meet its fuel demand is as high as 85% resulting in a huge foreign exchange outflow.

Emissions of Local Pollutants

In addition to GHG emissions, the Indian transport sector is also majorly responsible for emissions of local pollutants, with significant negative impacts on human health. This is a major issue because over 84% of India's population (and primarily the urban poor) are exposed to high concentrations of ambient air pollution, mainly from particulate matter (PM).[5] In urban areas, PM2.5 emissions are caused by industry and vehicles.[4]

Focus on Transport Decarbonization

The transport sector could become a major impediment to the carbon emission mitigation efforts of the country. In a business-as-usual scenario, transport emissions will continue to increase rapidly. Driven by economic growth and a low base, passenger and freight transport are estimated to grow three and sevenfold by 2050, respectively.[6] In a business-as-usual scenario, transport emissions will continue to increase rapidly. The carbon emission from the transport sector is estimated to grow by four folds by 2050 to 1164 million tonnes, and the share of emissions from transport in total emissions would increase to 19% from 13.5% at present.[7]

Significant efforts are required to be made in line with the focus areas of the Nationally Determined Contributions (NDCs) targets. In that context, the decarbonization of the transport sector has become an urgent priority and will contribute to achieving zero carbon emissions in the country. Transport decarbonization policies can also help manage the reduction in fuel oil demand, a priority for the government due to curtail and reduce the outflow of foreign exchange.

Decarbonization strategies/policies to achieve near-zero carbon emission may include electrification of road vehicles, long-term hydrogen-based fuel cells, increased usage of CNG/LNG and other biofuels, increasing fuel efficiency, and increasing the share of railways, particularly to replace the hard-to-abate road freight transport.

As per the Intergovernmental Panel on Climate Change (IPCC) alarming reports and projections, there is an immediate need for transport decarbonization policies. In India, the responsibility to draft and implement the decarbonization policy falls under the ministries of the central as well as state governments. Transport decarbonization policy requires to come up with empirical evidence and practical solutions, which needs the collaboration between both ministries (Central as well as State) civil societies, activists, industry, technology providers, and research organizations. This is primarily the need to set up the National Transport Decarbonization Council (NTDC).

5 Sharma, S. Air pollution as severe in villages as in urban India, reveals study, 2020
6 COP26 Charter of Actions by TERI, 2021
7 Decarbonization in transport sector: present status and future pathway by TERI, 2021

National Transport Decarbonization Council

The National Transport Decarbonization Council (NTDC) will bring all the stakeholders of different domains to a single platform for further discussions on the strategies and impact of important policy prescriptions towards the decarbonization of the Indian transport sector.

The Council will assess the decarbonization and zero-emission targets set by the government, particularly at the central level, and suggest strategies that would result in a significant impact on reducing emissions.

The Council looks into the hard-to-abate segments in the transport sector, particularly to decarbonize the medium- and heavy-duty vehicle segments.

Under the guidance of the Council, theme-based workshops on key issues in the transport sector (passenger and freight) will be organized backed by research as guided by the Council to suggest changes in the policies.

Keeping the aims and objectives in mind, the Secretariat (TERI) and Shakti Sustainable Energy Foundation, (SSEF) as technical support have identified the Vehicle Scrappage Policy, Emission Reduction and Efficiency Improvement, and Bio-Diesel as Fuel as three focus areas in this regard.

1. Vehicle Scrappage Policy

The Government of India through the Ministry of Road Transport and Highways (MoRTH) has notified the Motor Vehicles (Registration and Functions of Vehicle Scrapping Facility) Rules, 2021 for the establishment of registered vehicle scrapping facility (RVSF) across the country. The Rules will lead to the creation of environmental and safety standards compliant with scrapping infrastructure with fully digitized processes. The whole ecosystem along with RVSF will ensure the circularity of materials extracted from end-of-life vehicles.

The scrappage policy aims to scrap and recycle end-of-life vehicles (ELV) based on age, fuel type, and compliance to some norms such as emissions, etc. This would help eliminate vehicles with high emissions on roads strengthening emission reduction efforts and the transition to a circular economy.

Challenges in the existing policy

- Though various scrappage policies, dismantling, and segregation are clearly spelt out but these are silent about the disposal of hazardous materials.
- Criteria for fleet renewal/scrappage policies should be to induct vehicles complying with the latest emission norms.
- Current physical and financial infrastructure would not be able to trigger a large-scale scrappage of end-of-life vehicles (ELVs).
- Original Equipment Manufacturers (OEMs) are resisting the responsibility for ELV scrappage.

2. Emission Reduction and Efficiency Improvement

Overview of existing norms/standards

The Government of India developed the corporate average fuel efficiency norms (CAFÉ) for vehicles to moderate the rising demand for fuel. The aim is to lower the fuel consumption of vehicles resulting in lower carbon dioxide (CO_2) emissions to mitigate fossil fuel dependence and control GHG emissions. The vehicle manufacturers earn extra credit points based on their fleet performance on fuel efficiency.

Bharat Stage Emission Standards (BSES) are the emission norms regulated by the Government of India in order to control the pollutants from the tailpipe of engine (ICE) vehicles. These emission norms are based on the Euro standard emission norms and are updated periodically to make vehicles more environmentally friendly to improve the local air quality.

Challenges in the existing norms/ standards

- Less ambitious targets of CAFÉ norms
- Need for fuel efficiency norms for two-wheelers and three-wheelers
- Lack of detailed system for penalty mechanism for non-compliance
- Lack of comprehensive inspection and maintenance programme
- Shorten the time gap between European and Indian CAFÉ norms
- Need to increase the awareness among the vehicle owners
- Delay in decision and time schedule for next phase of emission normsInadequate reflection of real-world driving conditions in current test cycles

3. Bio-Diesel as Fuel

Existing scenario

Table 1: Phases of Biodiesel in India

Policy/Guidelines	Year	Summary/Objective
Biodiesel Purchase Policy	2006	The policy sets out measures to support activities for blending bio-diesel in diesel and marketing of such blended fuel.
National Mission on Biodiesel	2009	Objectives were to bring unutilized wasteland into productive use by promoting Jatropha and Pongamia Plantation for 20% blending with HSD.
Notification 1	August2015	The government allowed the direct sale of Biodiesel (B100) for blending with diesel to Bulk Consumers.
National Biofuel Policy	2018	India sets its target of achieving 5% blending (B5) of biodiesel with conventional diesel by 2030.
Notification 2	June2017	The government allowed the sale of biodiesel to all consumers for blending with diesel.
Guidelines	April 2019	The government has notified guidelines for the sale of biodiesel for blending with HSD for transportation purposes and has granted permission exclusively for the sale of biodiesel (B-100) onlyand not for any mixture thereof of whatever percentage.

Current status and challenges

While we are aware of the fact that petrol is blended with ethanol and the pace of production of ethanol from sugar mills for blending purposes has picked up, the Biodiesel Policy has not been able to match steps with Ethanol Blending Programme and has been on a backfoot. Biodiesel has not been bestowed the importance it deserved as diesel is the most consumed fuel for commercial vehicles and public transport.

In 2021, the national average blend rate was estimated to be about 0.09%. Biodiesel is manufactured from imported palm stearin, domestically sourced animal fats, used cooking oil (UCO), and small volumes of non-edible oils. Usage of biodiesel remains negligible due to several gaps such as:

- Limited availability of feedstock
- Lack of an integrated and dedicated supply chain
- Import restrictions
- Blended diesel consumers are limited to only a few OMC retail outlets

In India, the entrepreneurs who are typically fuel traders having comparatively better access to the domestic fuels market, dominate the biodiesel manufacturing and operate micro, small, and medium enterprises when compared to other countries that mostly rely on manufacturing units set up by vegetable oil refineries or large oil companies.

Role of the NTDC

The Council will provide valuable inputs and feedback on the theme-based background/status/policy paper to further contribute to shaping up the identified decarbonization strategies and building consensus through the exchange of ideas and evaluation and applicability of best practices, peer-to-peer learning, active participation, and networking. These findings will then be published in policy briefs/discussion papers/roadmaps to facilitate decision-making processes towards the decarbonization of the transport sector in India.

To know more about National Transport Decarbonization Council,
please visit https:/www.teriin.org/project/national-transport-decarbonization-council