



# WORLD SUSTAINABLE DEVELOPMENT SUMMIT 2022

**TOWARDS A RESILIENT PLANET:**  
ENSURING A SUSTAINABLE AND EQUITABLE FUTURE



## Virtual Stakeholder Roundtable on Sustainable Mobility for COP26 Charter of Actions



UN CLIMATE  
CHANGE  
CONFERENCE  
UK 2021

IN PARTNERSHIP WITH ITALY



UK Government

Bloomberg  
Philanthropies



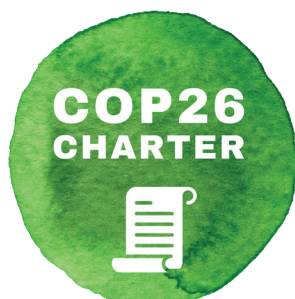
**SHAKTI**  
SUSTAINABLE ENERGY  
FOUNDATION

**TATA** CLEANTECH CAPITAL LIMITED

**Date:** 31 August 2021

**Time:** 15:00–16:30 hrs (IST)

**Duration:** 90 minutes



## **THE ENERGY AND RESOURCES INSTITUTE**

---

The Energy and Resources Institute (TERI) is an independent, non-profit organization, with capabilities in research, implementation, and outreach. TERI has multidisciplinary expertise in the areas of climate change, natural resources, environment, energy, and sustainable development goals. TERI's research and research-based solutions have had a transformative impact on industries and communities. It has fostered international collaboration on sustainability action by creating a number of platforms and fora. Research gets translated into technology products, technical services, as well as policy advisory and outreach. Headquartered in New Delhi, TERI has regional centres and campuses in Gurugram, Bengaluru, Guwahati, Mumbai, Panaji, and Nainital.



## WORLD SUSTAINABLE DEVELOPMENT SUMMIT

---

**The World Sustainable Development Summit (WSDS)** is the annual flagship event of The Energy and Resources Institute (TERI). Instituted in 2001 as the Delhi Sustainable Development Summit (DSDS), the Summit series marked 20 years in its journey of making ‘sustainable development’ a globally shared goal. Over the years, the Summit platform has brought together thought leaders, heads of state and government, scholars, corporates, youth groups, and civil society representatives from across the world. The Summit series has established itself as a responsible and an effective platform for mobilizing opinion-makers to identify and advance pioneering actions to address some of the most relevant issues concerning sustainable development. Perhaps the only Summit on global issues, taking place in the developing world, WSDS now strives to provide long-term solutions for the benefit of global communities by assembling the world’s most enlightened leaders and thinkers on a single platform. The 21st edition of WSDS will be held during **16–18 February 2022**, under the theme: **Towards a Resilient Planet: Ensuring a Sustainable and Equitable Future.**

## ACKNOWLEDGMENTS

---

The team expresses gratitude to Dr Vibha Dhawan (Director General, TERI), Mr Manjeev Singh Puri (Distinguished Fellow, TERI), and Mr Shri Prakash (Distinguished Fellow, TERI) for their leadership and guidance in conduction the dialogue. We would like to thank Mr Anoop Variyambath, Mr Shyam Sunder Nayar (DGO); Ms Shailly Kedia, Ms Anuradha Mathur, Ms Nivedita Choleyil, Ms Neha Joshi, Mr Kaushik Guha (WSDS); Ms Sonal Bajaj, Ms Sonali Mathur, Ms Ritu Ghai, Mr I I Jose (Events team); Ms Aastha Manocha, Ms Tanuja Mehta, Mr Shreyas Joshi, Mr Sumit Bansal, Mr Neeshu P Srivastava (Communications Team); Ms Dolly Sangle, Ms Aarti Parmar, Mr Varun Prakash Pandey, Mr Rohit Chauhan and Mr Paras Verma (IT); Mr Santosh Gautam, Mr Raman Kumar Jha, Ms Ipshita Mitra (TERI Press) for communication, coordination and technology support during the event.

## SUGGESTED CITATION

---

The Energy and Resources Institute (TERI). 2021. Proceedings of Virtual Stakeholder Roundtable on Sustainable Mobility for *COP26 Charter of Actions*. New Delhi: TERI.

## DOCUMENTATION

---

This documentation is not an exact transcription and some editing was done to make the messages clearer for the reader.

## CONTACT

---

WSDS Secretariat: [wds@teri.res.in](mailto:wds@teri.res.in)

## EXECUTIVE SUMMARY

---

The 26th United Nations Climate Change Conference of the Parties (COP26), to be held from 1 November to 12 November 2021 in Glasgow, will aim at mobilizing action on climate change mitigation, adaptation, and resilience, and aligning them with sustainable development goals (SDGs). There is a need to address the developmental deficit in emerging economies such as India while simultaneously taking measures to limit global warming as agreed in the Paris Climate Change Agreement. TERI is preparing a COP26 Charter of Actions which will assimilate questions and challenges posed by key sectors in India. The Charter will also propose probable and sector-specific options which can advance climate action and ambition in the country and a normative framework for a global agenda on climate ambition and action.

The roundtable was organized under the banner of TERI's flagship Track II initiative called the World Sustainable Development Summit.

Five themes have been identified as key areas for raising ambition. These include energy, clean transport, nature-based solutions, adaptation and resilience, and green finance. The following questions were laid out to guide the roundtable discussions on sustainable mobility:

1. Where can further action accelerate climate change mitigation ambitions from the transport sector?
2. What are the gaps that must be filled to realize the ambition? What actions are needed?
3. What measures are needed until 2030 and what measures are required until 2050?
4. How can the international community play a role? What are the 'asks' from the international community?
5. What are the implications of the current transport strategies on equity in terms of gender aspects and socio-economic strata?
6. Based on learnings from the Indian transport sector, what are the normative implications for the global framework on climate ambition and action?

The roundtable included experts from the public, private, and financial sectors who spoke on the challenges that need to be addressed to allow a sustainable mobility. The discussions highlighted some key points such as the importance of increasing the share of railways to bring down carbon emissions at the national level, and Indian Railways (IR) to improve the share of renewable energy in the total energy mix. In order to make railways more competitive, revisiting of railway policies is required to make it piecemeal traffic-oriented.

There is a need to look into interim plans in our effort to decarbonize the transport sector. There is a necessity to understand and adopt cleaner fuel, based on upstream, downstream, and consumption costs – financial and environmental. The government and multilateral agencies should provide support to lenders to work out bankable structures like partial risk guarantee or first loss guarantee, which could attract financiers for investments in new technologies, including EVs.

### Virtual Stakeholder Roundtable on "Sustainable Mobility" COP26 Charter of Actions

31 August 2021 | 3 PM IST



## PROCEEDINGS

---

### Welcome Address and Theme Setting

#### Mr Shri Prakash, Distinguished Fellow, TERI

In his welcome address Mr Prakash expressed his gratitude towards the distinguished panellists and participants. He said that the energy consumption of the transport sector is increasing rapidly and is a huge challenge, not only for India but also for the entire world. Even though a lot of steps have been taken by the government, there are more actions required for the decarbonization of the sector. The webinar was organized to discuss what more actions could be implemented for deep decarbonization. The technological changes require significant amount of fund and time. We have limited time to act on the commitments made under the Paris Agreement, he said.

### Present Trends and Future Decarbonization Pathways in India's Transport Sector

#### Mr Promit Mookherjee, Research Associate, TERI

Mr Mookherjee presented the findings and future decarbonization pathways, as highlighted in the study undertaken by TERI. He discussed the studies focusing on decarbonization of the transport sector in India, and electric vehicles (EVs), charging infrastructure, and the energy load curves for Delhi. Both the studies were supported by CIFF. During the presentation, he asserted that since the Indian Railways started losing its share in freight transport, the share of private modes of transport had increased as a consequence of the investments in road infrastructure. The study concluded that the transport sector in India was unique and did not follow the trend of other developed countries due to the nature of cities and low per capita income. Before keeping specific goals for India, some key features which must be considered include high logistics cost, dependence on intermediate public transport (IPT), and heavy dependence on two-wheelers.

The study also showed that significant emissions were on account of the transport sector. In 2016, Indian transport emissions were estimated to be 13% of the total emissions, annually. Of which, 90% emissions were contributed by the road sector. Still, if we compared emissions with other countries, India is at the upward point of the growth curve as we have lower per capita emission rates and lower per capita motorization rate, he explained.

The Nationally Determined Contribution (NDC) is a key document, which is referred for the decarbonization policies. There are specific areas of focus related to transportation in India's NDC – fuel efficiency policies (National Auto Fuel Policy and Efficiency Standards), which has led to significant efficiency improvement and emissions reduction. Scrappage Policy, 2021 has the potential to considerably improve efficiency in the transport sector. Electric mobility has gained much importance at the state and central-level policies. However, there are issues in the implementation of these policies in terms of financing, higher costs, provision of charging infrastructure, lack of awareness, and increasing the adoption by the end customers.

The NDC targets to increase the share of rail in the total transportation from 36% to 45% by 2030. To improve competitiveness of the railways vis-à-vis the road sector, there is a need to make better marketing and tariff policies, increase railways capacity, and provide better services to the customers. Other targets in the NDC were to develop mass rapid transit systems and mass urban transport systems. Progress has been made in expanding the urban metro systems; however, utilization in terms of low ridership is still a major concern.

There are other areas which need improvement, such as biofuel technology and its adoption. Due to non-availability of raw materials that are needed for

biofuel production and the corresponding geographic locations, blending rates are fairly low which remain around 6–7%. There is a need to consider the implications and scalability of second and third-generation biofuels.

There are some areas that are lacking like public bus transport, which is inadequate. Given the share and affordability of the bus system, there is a scope for improving the bus system; otherwise, there could be a major shift from public transport to private transport systems and energy-intensive modes of travel.

It is also necessary to carry out decarbonization strategies in Indian cities which are city-specific and planning-oriented. Given the recent trends, motorization rates will increase and the road sector will continue to dominate specifically in the growth of HCVs in freight movement and therefore, finding solutions in this segment is essential for decarbonization. In the business-as-usual (BAU) scenario, the transport sector is estimated to emit 24.44 gigatonne of CO<sub>2</sub> by 2050. One of the most prominent energy-efficient technologies is EVs, which is expected to receive government policy support and witness lower battery prices in the coming years. But the cost-effective transition is difficult for all segments, especially heavy-duty vehicles and intercity buses, and therefore, a clear road map is mandatory.

There are other alternatives such as CNG, LNG, and EVs that are available. LNG is supposedly a better solution for the long-distance heavy-duty segment but investing in these alternatives is considered to be risky because if the hydrogen technology comes up in near future or the battery prices go down, that will result in locking of investment in a particular technology. A clear investment path and a proper strategy on how to approach these fuels are required before deciding on which technologies should be considered for the decarbonization of the sector/vehicle segment.

TERI's study concluded that the high uptake of EVs in easier-to-transition segments is estimated to

reduce tailpipe CO<sub>2</sub> emissions by 22% by 2050 and when combined with solutions for “hard to electrify segments”, multiple technologies were looked into, and it was found that with a mix of EVs, hydrogen, and LNG, the emissions are estimated to reduce by 38% by 2050 as compared to the BAU scenario.

## Roundtable Discussion

### Chair: Mr Shri Prakash, Distinguished Fellow, TERI

Mr Prakash emphasized having a clear understanding while deciding the realistic time frame for decarbonization as the new technologies in the transport sector are not only time-consuming but also require huge investment. He expressed concerns in achieving some of the targets such as increasing the railway market share by 2030, even though railways are making investments in capacity enhancement. He also highlighted some of the actions and policy measures that could be taken towards transport decarbonization by 2050. It is important to understand the impact of climate change on vulnerable communities, since it affects the lower incomes group the most, he said.

### Mr Badri Narayan, CAO (TT & BRU), Northern Railways

Mr Narayan foregrounded the importance of increasing the share of railways to bring down carbon emissions at the national level. Apart from his emphasis on electrification, which is one of the main strategies of making railways a low emission sector, IR is also focusing on trying to improve the share of renewable energy in the total energy mix. There are also efforts to bring in several technologies, both in locomotives and wagons. The three-phase locomotives are expected to be much energy-efficient and powerful, while the newer design wagons will have increased capacity to carry heavier loads. The strategies are focused to increase the capacity of the rail network. The railways have invested heavily in the electrification, making the rolling stock market congenial to investors and private developers, thereby improving technologies. The real challenge is to capture the share of freight transport back from the



other competing modes, especially road transport. The IR has an extremely low share of transporting high-value commodities. Ever since the draft National Rail Plan (NRP) has been tabled in December 2020, IR is focusing on improving the share in the 'balance other goods' category. The share of railways started declining since liberalization, as the transport demand skewed towards piecemeal traffic. During 1980s, IR's policy shifted from transporting 'piecemeal traffic' to 'rake-load traffic'. Since liberalization, smaller consignments started being transported to and from industrial locations, and as IR policy did not allow piecemeal traffic and consignments having less than wagon load, the railways' freight share started declining. In order to make the railways more competitive, revisiting of railway policies is required to make it piecemeal traffic-oriented, he concluded.

**Mr Karthick Atmanathan, Professor of Practice, IIT-Madras**

Mr Atmanathan expressed his views on decarbonization efforts in India and other countries. He said, there are various sectors that need policy interventions. Specifically, he talked about four areas where there is a significant potential.

(1) Long-distance trucking, which is responsible for 60% CO<sub>2</sub> emissions, is a segment where battery-electric technology could be introduced. The concerns today are two-fold – massive infrastructure requirement and trade-off between payload and battery size. In India, there are several corridors where multi-axle and smaller vehicles travel about 500–600 km per day (250–300 km per day one way) and in most cases, these vehicles return empty. There are green funds available to identify such corridors and conduct pilot projects. For example, from Chennai to Bengaluru, 300 vehicles return empty after delivering vehicles to the vegetable market in Chennai. Such corridors are high potential areas for electrification.

(2) Instead of e-tractors in the agriculture sector, e-tillers and e-harvesters are likely to be more competitive, as most of the Indian farms are 1–3

acre in size and may not need e-tractors on a full-time basis. If the Indian panchayat network sets up sustainable e-equipment facilities in the farms, farmers can own the e-tillers and e-harvesters on rent instead of direct purchase.

(3) Next, Mr Karthick mentioned that hydrogen fuel is fairly a long way off in terms of both feasibility and viability. Therefore, there is a need to look into interim plans in our efforts to decarbonize the transport sector. For example, long-distance trucking can reduce carbon emissions through hybridization using viable technologies and promoting it aggressively with a lot of upfront capital subsidies in non-private sectors as the government's ability to provide subsidy and grants is much easier.

(4) Metro operators can work with buses and auto drivers and offer a well-networked solution for city passengers at the national level and that is how, it can address concerns of under-utilization.

Besides, he talked about mechanisms required to support R&D at the administrative level, which will bring a paradigm shift in the economy. He also emphasized giving more opportunities to women in the transport sector. To make women step out, there is a need to ensure attractive employment opportunities and security at the workplace, he signed off.

**Mr Jasjit Sethi, CEO, TCI Supply Chain Solutions**

Mr Sethi expressed his views related to the logistics sector and efforts to reduce carbon footprints. He also highlighted that the industry requires government support for clean-energy solutions. There are alternatives to EVs, such as biofuel, CNG, LNG, and hydrogen. EVs are supposedly the cleanest vehicle technology available, with zero tailpipe emissions. However, at the electricity generation and battery disposal stages, it is still carbon-intensive and environmentally sensitive. He mentioned that electrification is more about shifting problems somewhere else. There is a need to understand and

adopt cleaner fuel based on upstream, downstream, and consumption costs – financial and environmental. He cited the high use of ethanol in Brazil and highlighted the need to introduce LNG vehicles in the MHDV segment and increased blending of biofuel.

**Mr Sampath Kumar Velamoor Srinivasan, Head, Business Development, Tata Cleantech Capital**

Mr Srinivasan shared his views on the private sector's efforts towards decarbonization of transportation from the perspective of financial stability. The government and multilateral agencies should provide support to lenders to work out bankable structures. From the perspective of debt providers, risks must be mitigated and managed in a structured way. To that extent, there could be support through risk-bearing mechanism, where the existing lenders are willing to fund new technologies. Structures like partial risk guarantee or first loss guarantee can attract more financiers for investments in new technologies, like EVs.

Capital fund is available for railway projects but an appropriate contract structuring is a must, which would ensure risk is not loaded in favour of the private player but allocated between the government and the private player. Notably, railway/road-related concessions are typically long-term contracts of 10–30 years. The risk allocation needs to happen in such a way that it incentivizes the private sector players. There is a need to create a robust framework for prioritization in terms of money, which can last for the next 15–20 years. In other areas such as setting up charging infrastructure, bankable framework is hard to find but financiers are trying their best to structure these from a financial point of view as financing is one of the important aspects along with policy and regulation, he said.

**Ms Haimanti Poddar, Senior Energy, Climate Change & Urban Advisor, COP 26 Zero Emission Vehicle Transition India Campaign Lead, British Deputy High Commission, Kolkata**

Ms Poddar elaborated on what could be done towards

international cooperation, particularly bringing new technologies to India. To enable EV transition to be faster, it needs a systematic transformation involving state governments, businesses, and non-state actors, and offer benefits in terms of climate, air quality, energy security, and gender equity. But each of these elements should overcome a variety of barriers such as affordability, performance, and so on. Globally, governments are implementing low-carbon measures across five areas including Zero-Emission Vehicle (ZEV ) target, regulations, incentives, infrastructure, and consumer awareness.

The UK Climate Change Committee, which is an independent advisory body to the UK government and reports on reducing emissions and adapting to climate change, provides regulations on the pace of global transport transition to help achieve the targets set under the Paris Agreement. She highlighted that the recent report published by UK-CCC focuses on emissions from road transport with a target of zero-emission by 2050. There are a number of barriers that include rapid scale up production of zero-emission vehicles, support to the automotive industry, development of skilled labour force, and infrastructure support. But the individual government cannot solve these challenges alone and international collaboration is required, along with partnerships with industries, businesses, sub-national actors, and civil societies.

UK, in partnership with Italy, is the host nation for COP 2021 , scheduled in November 2021. The plan is to enabling ministers and representatives from the world's largest progressive markets to come together and form the Zero Emission Vehicle Transition Council. The purpose of this Council would be to discuss strategies to increase the pace of ZEV adoption and overcome key challenges associated with the industry.

Gender equity is an extremely important aspect in the sector, primarily because transport infrastructure and services are means to improve the well-being of the

people by facilitating economic and social benefits. Measures need to be designed to suit the needs in ways that are equitable, affordable, and responsive. There are gender differences in travel patterns and use of transportation modes, from the point of view of access, time of use, and safety. Also, there are gender differences in transport within rural, peri-urban, and urban contexts. Up-skilling of women in terms of transport ancillary work, service delivery, contribution to EV sector, is needed in the present times.

There are ongoing projects like 'Green Growth Equity Fund' where India and UK have come together with £120 million each to support green initiatives in the country. One of the focus areas is to promote and deploy electric buses in various Indian cities. For innovation and technological readiness, there are focused institutions, including Battery Industrialization Centre in UK, where industries and the research institutes come together on a common platform to work on battery innovations, efficiency, and recycling.

## **Vote of Thanks**

### **Mr Sharif Qamar, Fellow and Area Convenor, TERI**

Mr Qamar thanked all the speakers for joining the roundtable discussion. He reiterated that all the points were duly noted and as a follow-up, a questionnaire was circulated where the speakers shared their inputs. All the funders and supporters who contributed to developing the Charter, namely, the British High Commission, Shakti Sustainable Energy Foundation, Bloomberg Philanthropies, and Tata Cleantech Capital were acknowledged.

## KEY TAKEAWAYS

---

The speakers highlighted that India's mobility scenario is very unique and within the country itself, there are diverse priorities and challenges. However, there are several opportunities in the sector for decarbonization. The key takeaways from the discussions are as follows:

- ♦ It is very important to increase the share of railways to bring down carbon emissions at the national level. The need of the hour is to revisit and reframe railway policies and operation.
- ♦ There is a need to look at interim or medium-term plans, including fuel technologies such as LNG, CNG, and biofuels. This is especially true for the hard-to-abate segments, such as buses and commercial vehicles.
- ♦ There also is a necessity to partner with developed countries at the initial stages of the technology development for the transport sector. This will facilitate enhanced learning for the developing world and ensure easy implementation.
- ♦ Government support in the financing of low-carbon technology vehicles is the need of the hour.
- ♦ To enable faster EV transition, there is a need for a systematic transformation involving the state government, businesses, and non-state actors.

## ABOUT COP26 CHARTER OF ACTIONS

Under the presidency of the UK in partnership with Italy, the 26th UN Climate Change Conference of the Parties (COP26), to be held from 1–12 November 2021 in Glasgow, will aim to mobilize the action on mitigation, adaptation, and resilience, and strengthen the narrative for better alignment with sustainable development goals. COP26 is to deliberate on four key goals: (i) Secure global net zero by mid-century and keep 1.5 degrees within reach; (ii) Adapt to protect communities and natural habitats; (iii) Mobilise finance; and (iv) Work together to deliver. COP26 will bring together countries, companies, civil society, and citizens on a common platform to work towards to a more sustainable future through adaptation, mitigation, finance, and collaboration.

There is a need to address the developmental deficit in emerging economies such as India while simultaneously taking measures to limit global warming as agreed in the Paris Climate Change Agreement. TERI is preparing a COP26 Charter of Actions which will assimilate questions and challenges posed by key sectors in India, propose probable and sector specific options which can advance climate action and ambition in the country, and also propose a normative framework for a global agenda on climate ambition and action. The Charter is expected to be released at the COP26 in Glasgow. The discussions from COP26 would culminate in a review at a plenary session at the World Sustainable Development Summit 2022, which would assess the efforts of international climate negotiations in securing a sustainable future, and deliberate on future actions. The Charter will examine the themes of energy, clean transport, nature-based solutions, adaptation & resilience, green finance, business and industry, and equity. The Charter activities are supported by the British High Commission, Bloomberg Philanthropies, Shakti Sustainable Energy Foundation and Tata Cleantech Capital.

## WSDS PARTNERS

### Country Partner



UN CLIMATE  
CHANGE  
CONFERENCE  
UK 2021  
IN PARTNERSHIP WITH ITALY



UK Government

### Premier Partners

**Bloomberg  
Philanthropies**



**TATA CLEANTECH CAPITAL LIMITED**



## CONTACT

WSDS Secretariat: [wds@teri.res.in](mailto:wds@teri.res.in)