



Task Force 4  
**Refuelling Growth: Clean Energy  
and Green Transitions**



INDIA 2023



भारत 2023 INDIA

# FAST-TRACKING ROAD TRANSPORT DECARBONISATION THROUGH A NEW 'INTERNATIONAL SUSTAINABLE TRANSPORT ALLIANCE'

July 2023

**Mahua Acharya**, Former MD and CEO, Convergence Energy Services Limited (CESL)

**Souvik Bhattacharjya**, Associate Director, The Energy and Resources Institute (TERI)

**Lukas Lingenthal**, Policy Advisor, Mobility, Konrad-Adenauer-Stiftung (KAS)

**Arpita Pandey**, Research Associate, The Energy and Resources Institute (TERI)

**Aaran Patel**, Director, Climate, The Nand & Jeet Khemka Foundation


वसुधैव कुटुम्बकम्

ONE EARTH • ONE FAMILY • ONE FUTURE



# **Abstract**






**C**lean and affordable public transportation can lower carbon emissions, improve urban air quality, and enable economic development. India's G20 presidency can leverage the country's National Electric Bus Programme to serve as a model that can be replicated across emerging market and developing economies.

This policy brief proposes the creation of a new institution, the International Sustainable Transport Alliance (ISTA). Building off India's leadership, the


creation of the ISTA can accelerate progress towards a low-carbon and climate resilient future by: raising national ambitions and sending clear market signals to industry players; providing policy visibility through the creation of policy roadmaps; developing pipelines through project preparation and demand aggregation; handling residual risk through blended finance mechanisms in order to unlock unprecedented private sector finance; and syndicating the resulting clean transportation investment opportunities to specific profiles of investors.



# The Challenge




1



**T**he transport sector accounts for nearly 25 percent of global CO<sub>2</sub> emissions. Further, emissions from the transport sector in the G20 are attributable to more than two-thirds of this share (Vorholz, 2018). In particular, road transport contributes the highest share (87 percent) in sectoral greenhouse gas (GHG) emissions (Paladugula et al., 2018). The G20 countries continue to rely heavily on oil in the sector. Emissions from the transport sector are rising and the interventions have not yielded observable decline in this trend at the global level. Recent assessments reveal that by 2050, total emissions from the sector are estimated to be nearly 13.5 Gt of CO<sub>2</sub>, which would be 93 percent above 2010 levels (Vieweg et al., 2018). Taking into account the increasing global population and growing affluence in emerging markets and developing economies (EMDEs) in combination with a rapidly growing rate of motorised transport (with above average rates especially in regions of the Global South) (Lingenthal & Khant, 2022), it is clear that decarbonisation of road transport must be one of the top priorities on the international climate agenda.

Rising disposable incomes, growing human aspirations, and a greater need for mobility could lead to an upsurge in ownership of personal automobiles. This will drive up demand for materials including iron, molybdenum, aluminium, and plastics that go into manufacturing various automobile components. Nonetheless, there are challenges associated with augmenting these materials. Fossil oil is the main source of plastics. Aluminium has environmental issues due to red mud production and disposal. Petroleum products form the bulk of the resources that end up getting consumed during the use phase. Many of these materials are critical and their unequal geological distribution will further aggravate resource security concerns and trade balances of importing countries. Often the conversion of resources to usable metals and materials are complex and require significant energy, water, and other process chemicals. Hence, augmenting these materials will pose significant threat to environmental quality.

In efforts to lower transportation emissions intensity, comprehensive and systematic action plans are imperative. The avoid-shift-improve



(ASI) framework of sustainable mobility involves reducing vehicles distance travel, adoption of low emission fuels (including biofuels and ethanol blending in petrol), other latest technology (such as electric vehicles and hydrogen fuel cell vehicles), and improvement in vehicle designs and fuel efficiency (GGGI and CSS, 2015). Further, the added benefit of decarbonisation from electrification will be realised when cleaner sources of power are harnessed. This will eventually lead to lower carbon emissions, improvement of urban air quality, and economic development.

Electric buses would provide cost efficient and environment friendly

solutions. However, electric mobility – and buses in particular – suffer a financing challenge in many economies. In India, debt finance is challenging when contracts face state transport undertakings. Financing is also a challenge because operators lack balance sheet depth. The sector suffers from institutional fragmentation in India and several other countries.


Accordingly, the International Sustainable Transport Alliance (ISTA) would work towards providing a knowledge platform by assessing future economic opportunities and challenges and identifying best practices.



# The G20's Role



# 2



## Creation and role of the International Sustainable Transport Alliance

**T**he decarbonisation of road transport is particularly challenging. The number of stakeholders is enormous, and the vehicle fleet—including public vehicle fleets, large company fleets, individual cars, and motorcycles in private ownership—is extremely decentralised. In urban areas, the need for mobility, traffic management, servicing the needs of dense populations and combatting air pollution come together. With the global trend of urbanisation, it is estimated that already 85 percent of the world population lives in urban areas and that this number will still be growing in the coming decades, especially in EMDEs (Ritchie, 2018). Therefore, it can be worth starting where the decarbonisation of the vehicle fleet is easier to implement due to central structures and a critical mass. In many countries, such a starting point is local public transport in cities and in particular bus fleets.


In many places, bus systems are wholly or partly in public hands or licensed to private operators through public

tenders and framework agreements. The conversion of the city bus fleets to zero emission vehicles and the provision of the required charging infrastructure can thus be simultaneously organised by a relatively small number of players with large vehicle fleets. There is also the advantage that the charging infrastructure does not initially have to be expanded in a decentralised manner across the entire road network of a city, but can be set up centrally at the bus companies' depots.

However, in addition to the most central players and large bus fleets, starting the electrification of the vehicle fleet, at least in cities, a large number of stakeholders will still need to be involved including manufacturers of buses, private sector players providing batteries and charging stations, electricity grid operators and electricity producers, public administration, bus companies, banks, and other financiers.

The G20 can provide a good framework to enable agreements to support and finance decarbonisation of the bus system across member countries. Given the decarbonisation and development priorities of the G20, a focus on financing large scale electric bus adoption can be






a key driver for a green and inclusive future. In this regard, there is much to learn from India's National Electric Bus Programme (NEBP), which has become a global case study for transport decarbonisation. This effort has involved navigating several challenges to transform electric mass mobility into an infrastructure asset class. India's NEBP efforts present financing opportunities of US\$10 billion for 50,000 e-buses and US\$0.5 billion for 100,000 electric three-wheelers, and more if we consider the associated infrastructure, and will also create ~5 million green jobs in roles such as manufacturing, technology development, maintenance, digitalisation, and operations and maintenance. There will be similarly large economic and employment opportunities in several EMDEs that are part of the G20.

There have been five key steps to India's work in electrifying mass mobility, each of which ought to be replicated to build a zero-emissions transportation future. These are as follows:

- **Leveraging ambition:** India has sent a clear market signal through its target of 50,000 electric buses by 2030. In a similar regard, institutional initiatives should

connect with and raise existing political ambition through efforts like the Zero Emission Vehicle Mission Initiative.

- **De-risking through policy roadmaps:** Through the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme and other ambitious policies, India has provided significant subsidies and incentives to de-risk sectors for sustainable transport. Similarly, across G20 countries, policy roadmaps will need to be created to de-risk markets and enable flows of necessary finance.
- **Pipeline development and aggregation:** India's demand aggregation and standardisation of contracts across cities and states has enabled a significant reduction in operating costs per kilometre for electric buses. Across EMDEs, the fragmented nature of transport is a huge challenge. Following the Indian model, there is a need for a demand pipeline to aggregate zero emission transport options, identify archetypes, and build taxonomies to allow comparative evaluation of risks.
- **Create and activate blended finance mechanisms:** India will be on the path to achieving its goal of 50,000 electric public



buses on roads by the end of the decade if the residual risk of timely payments by the customer to operators is addressed. A bus financing facility targeted at US\$10 bn, with a payment security fund, 12-year loans, and carrying contracts from state transport bodies and the private sector will significantly overcome the financing challenges. Similarly, across EMDEs, there is a need to clearly define the asset classes, conduct diligence work, build appropriate capital structures, and create blended finance facilities.


- **Syndicate to investors:** Finally, once these steps have been adequately covered, it is necessary to convene a network of investors towards active project cycles and especially identify types of investors tailored to project types.

### **Purpose and Structure the Alliance**

In addition to the Indian government's ongoing work on the NEBP through Convergence Energy Services Limited, a subsidiary of the Indian Ministry of Power, India is supporting its mass mobility financing needs and advising other countries through an independent

company called the Financing the Advancement of Sustainable Transport (FAST). Registered in India, this entity will have a supervisory committee of business, government, and policy leaders and a project management unit for capacity building.

Drawing on lessons from India, FAST will be creating an international division and signing MOUs with respective and relevant departments and ministries across countries looking to adopt the process outlined above for their transportation decarbonisation objectives. These agreements will enable work on technical assistance for international work with other EMDEs as needed on issues including policy roadmap creation, advising on regulations, demand aggregation and public procurement, drafting contracts, tenders and structures, and learning from and disseminating best practices. FAST will initially host the ISTA until this acquires capacity, funding and momentum to become an independent institution. For its work to scale through South-South partnerships (for both G20 member and non-member countries), FAST will require funding and capacity that can be jointly explored between G20 member countries.



This policy brief argues that the G20 is an opportunity to accelerate this work, and to support and launch the ISTA. The first sub-sectoral initiative could be focused on electric buses as they help achieve a range of decarbonisation and development goals as mentioned above. This is an opportunity for India to demonstrate leadership in innovation and sustainable development, and be the catalyst for developing economies' transition to sustainable transport. ISTA could also help other countries to learn from India's experience and transform their respective transport systems.

### Other factors

In addition to the large-scale introduction of e-bus fleets, another point is essential in order to move towards the decarbonisation of transport i.e., the decarbonisation of power generation. Without electricity from climate-neutral sources, an e-bus cannot be operated in a climate-neutral manner. Efforts to expand grid capacity and the available amount of electricity (needed for increasing electrification of transport) must therefore go hand in hand with the decarbonisation of electricity generation. In a recent assessment on carbon footprint of four-wheeler EVs

for India, even with relatively high grid GHG emission factor, life cycle emission for EVs has been found to be the least. Further, decarbonisation of the grid can reduce the total emission from EVs to nearly 50 percent of that of internal combustion engine vehicles. Concerns are often raised regarding security of materials that go into manufacturing batteries and power trains. This calls for robust end of life battery management and recycling policies that will facilitate augmenting secondary materials for future manufacturing thereby decoupling primary dependence on critical materials.

Far greater efforts are needed to decarbonise road traffic beyond local public transport. If a country's vehicle fleet is to be increasingly electrified, in addition to the availability of appropriate affordable cars, two- and three-wheelers as well as the batteries required for them, the power grid must also be upgraded, the electricity mix converted to renewable sources, and a decentralised charging infrastructure provided. Whether this approach is suitable for a country and whether only urban areas are considered or whether longer overland routes are also to be involved can only be decided by each



country on the basis of local conditions. However, the decarbonisation of road traffic in other ways, for example through biofuels, e-fuels, or hydrogen, requires financial and structural efforts, in which countries in the Global South in particular must not be left alone.

Without the mobilisation of private investment, the financing of such extensive transitions will not be possible, as has now been emphasised in numerous studies and publications. In order to attract more private investment to developing countries, a


framework is needed that minimises some risks, which are often a hurdle for large investments. These include in particular currency risks, high cost of capital that increases the costs of deployment, policy risks, and billing, payments and collection risks. This framework is contained in FAST and the ISTA. Multilateral development banks (MDBs) could be used as financial institutions to hedge such capital risks and thus help to mobilise many times more private investment than they can provide themselves in the form of grants or loans (GCA, 2022).



# **Recommendations to the G20**



# **3**



**T**he G20 must consider taking the following steps:

### **Set up the Alliance with participating countries**

The G20 can serve as a catalytic platform for the creation of this institution, similar to the creation of the Global Infrastructure Hub and other purpose-built institutions that act as convening mechanisms for member countries.

### **Call for participation**

The ISTA will require inclusive participation from governments, the private sector, financiers, and a range of international organisations. In addition to convening processes in G20 member countries, the ISTA will be

open to participation from non-member countries too.

### **Call for project preparation funding**

Participating G20 member countries and non-member countries can make voluntary contributions to operationalise the ISTA and provide organisational structure.

### **Include financiers**

These will include convening asset owners, asset managers, blended finance institutions (MDBs and development financial institutions) and financial intermediaries to be involved in the respective processes of the ISTA.

Attribution: Mahua Acharya et al., “Fast-tracking Road Transport Decarbonisation through the Creation of the International Sustainable Transport Alliance,” *T20 Policy Brief*, July 2023.

## References

---

- GCA Collaborative. *A Global Climate Alliance for Accelerated Climate Action*. New Delhi: Observer Research Foundation, Brussels: Konrad-Adenauer Stiftung, and Berlin: German Institute for Economic Research (DIW Berlin), 2022.
- GGGI & CSS. *Electric Buses in India: Technology, Policy and Benefits*. Global Green Growth Institute (GGGI) and Centre for Study of Science (CSS), 2015.
- Lingenthal, L. and Khant A.A. *Decarbonising the transport sector in the Global South*. Konrad-Adenauer-Stiftung, 2022.
- Paladugula, A. L., nazar Kholod, Vaibhav Chaturvedi, P.P. Ghosh, Sarbojit Pal, Leon Clarke, Meredydd Evans, Page Kyle, Poonam Nagar Koti, Kirit Parikh, Sharif Qamar, and S.A. Wilson. "A multi-model assessment of energy and emissions for India's transportation sector through 2050". *Energy Policy* (Volume 116, 2018): 10-18, ISSN 0301-4215. <https://doi.org/10.1016/j.enpol.2018.01.037>.
- Ritchie, H. "How urban is the world?". Our World in Data, September 27, 2018.
- Vieweg, M., D. Bongardt, C. Hochfeld, A. Jung, E. Scherer, R. Adib, and F. Guerra. *Towards Decarbonising Transport – A 2018 Stocktake on Sectoral Ambition in the G20*. Agora Verkehrswende and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), 2018.
- Vorholz, F. "G20 Countries Must Act Quickly to Decarbonise The Transport Sector". *Agora Verkehrswende*, November 30, 2018.



वसुधैव कुटुम्बकम्

ONE EARTH • ONE FAMILY • ONE FUTURE