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Policies for India's global leadership on EV adoption

Accelerating commercial fleet electrification and attracting private investments in charging

Contents

Knowledge contributors

With thanks and recognition to all the companies who have contributed to this paper.

Uber

A wide range of WBCSD's REmobility coalition members reviewed this material, ensuring that the document broadly represents the majority view of the major Indian companies in the EV value chain. The businesses who collated these recommendations are committed to supporting India's policies to transition India's mobility to a cleaner future. It does not mean, however, that every company within the group agrees with every reasoning and every recommendation presented in this report.

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Foreword

India envisions a paradigm shift towards clean, safe, accessible, affordable and efficient mobility that improves quality of life for its 1.5 billion citizens by the end of this decade. Sustainable mobility is central to a fast-urbanizing India and is the country's next frontier in its fight against climate change.

As one of the fastest growing economies and as the world's fourth largest automobile market, India holds a significant stake in the global transition towards a more sustainable mobility system.

Electric mobility powered by renewable energy can help reduce pollution in our cities, lower India's oil import bill, meet the nationally determined contributions for climate change, and make mobility more cost-effective and accessible. The transition will equally be determinant for the country's industrial strategy going forward as India is expected to become the third largest automotive market in volume by mid-decade.

The Government of India has championed the idea of "clean kilometers" through its support for shared, electric and connected mobility. The government is committed to adoption of electric vehicles, with a total outlay of INR 100 billion (USD $1.4 billion) of incentives under the second phase of the Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India scheme.

Several other measures, including delicensing of charging infrastructure to create a scalable competitive market, a reduction in the indirect taxes and benefits on direct taxes for EV buyers, have been announced in order to increase the uptake of electric vehicles. Several state governments have formulated progressive policies to attract manufacturing and adoption of electric vehicles.

The private sector has a critical role to play in realizing India's transition to sustainable mobility. Businesses need to innovate, invest and deploy solutions at scale to support healthy and smart cities. NITI Aayog recognizes the importance of business actions contributing to India's shift towards sustainable mobility.

Businesses working through the World Business Council for Sustainable Development have taken proactive steps toward accelerating adoption of electric vehicles in India. We appreciate forward-looking businesses for their leadership on electrification of mobility and thank them for suggesting policy measures that can further help accelerate their actions.

Coordination between policymaking and business actions can soon make India a global leader on EV adoption.

(Amitabh Kant)

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Foreword

It is universally agreed now that Climate Change is a growing challenge world over and there is an increasing momentum for transition towards a low carbon economy. The key philosophy driving this transition is decarbonizing transportation sector through electrifying activities such as transformative electric-mobility.

India is facing a challenge of high fossil fuel consumption perpetuated by the trend towards privately owned vehicles, reinforcing the importance of an alternative clean mobility future. The transport sector which contributes in a large measure to the emissions has been identified as an area which needs immediate intervention to see the desired results. India has submitted its Intended Nationally Determined Contributions (INDCs) in 2015, and aims to reduce emissions intensity of its Gross Domestic Product (GDP) by 33 to 35 percent by 2030 from 2005 level.

Government of India has been working to promote Electric Vehicles to meet multiple objectives, inter alia, attaining zero emission goals, energy security, energy efficiency etc. In this regard creation of Charging Infrastructure in the country is one of the critical areas to push the plan to promote Electric Vehicles in the country.

In line with the mandate of facilitating the establishment of Charging Infrastructure in the country, Ministry of Power has issued the Charging Infrastructure for Electric Vehicles (EVs) – Revised Guidelines and Standards to facilitate the establishment of reliable network of Charging Infrastructure in the country. The technical arm of the Ministry of Power i.e. Central Electricity Authority (CEA) has issued amendments in the regulations regarding Technical Standards pertaining to Grid Connectivity and Safety of supply for Charging Stations. Bureau of Energy Efficiency (BEE) has been nominated as the Central Nodal Agency (CNA) for facilitating the installation of Charging Infrastructure for EVs in the country.

Apart from Ministry of Power, the Ministry of Housing and Urban Affairs (MoHUA), has issued amendments in Model building By-Laws and Urban and Regional Development Plans Formulation and Implementation Guidelines for facilitation of charging infrastructure in commercial and residential buildings. Department of Heavy Industry (DHI) is administering Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) India Scheme since 01st April, 2015. A number of State Governments have also brought out their respective Electric Vehicles (EVs) Policies to promote the eco-system of e-mobility.

While the Government has been actively working to facilitate the Public Charging Station (PCS) installations, the Private Sector Public Charging Point Operators are the key players in ensuring the installation appropriate network of Public Charging Stations and alleviating the range anxiety amongst the EV owners. Ministry of Power recognizes the efforts of Businesses in innovation and their commitment towards driving the transition of the country towards a cleaner and greener E-Mobility future.

We also appreciate the efforts of World Business Council for Sustainable Development (WBCSD) in identification of issues being faced by these businesses in e-mobility segment. We hope that all the stakeholders would take proactive actions on the recommendations suggested by the report of WBCSD and address the concerns raised in the report in order to promote eco-system of transformative e-mobility in the country. We hope that the outcome of such combined effort shall be visible soon.

The private sector as the implementors of the India's vision along with the catalytic role by the Government will help India in taking the leapfrog transition towards E-mobility.

(Vivek Kumar Dewangan)

Foreword

Mobility is at the core of urban life and economic activity. It provides people with access to work, health, education, goods, services and leisure. Mobility systems are essential to the modern economy, but for most large cities, they are not sustainable.

Transport has been one of the fastest growing sources of emissions and is responsible for the unforgiving congestion and pollution in most large Indian cities. Rapidly evolving technologies and business models offer pathways to sustainable mobility.

Businesses can lead this transition. Adopting sustainable corporate mobility policies can substantially decrease emissions, optimize traffic flows and improve the lives of our employees, customers and fellow city-dwellers. COVID-19 demonstrated the need to build resilient mobility systems and offers a unique moment to push for systemic change.

The scale of businesses and commercial fleet operators enables the economic viability of electric vehicles and makes them critical catalysts for fast adoption in the context of the growing Indian market. The Indian government's policies to support electrification of mobility have allowed businesses and fleets to deploy electric vehicles and the related charging infrastructure.

Indian business leaders are committed to making mobility more sustainable.

WBCSD has been a catalyst of collaboration and has led our consortium experts to offer consensus-based policy recommendations that can accelerate electric vehicle adoption and facilitate private investments towards creating an energy and charging infrastructure for the future.

This report collates these consensus-based policy suggestions and proposes practical means to improve coordination between businesses and policymakers to make India a global leader on EV adoption.

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Foreword

India's sustainability challenges are globally critical and the country is vulnerable to the effects of climate change. The country is home to one sixth of the world's population and is one of the fastest growing economies, rapidly building new infrastructure for its energy system and built environment. At the same time, India is also home to 22 of the world's 30 most polluted cities.[1]

Road transport is one of the fastest growing sources of carbon emissions. The carbon dioxide emissions[2] in India from road transport are expected to double over the next two decades. India is the third largest global emitter of carbon dioxide despite low per capita emissions. The speed of adopting zero-emission vehicles and renewable energy in a large country like India can have a measurable impact on global decarbonization efforts. A successful realization of FAME II and other current policy measures (for commercial and public adoption) could realize an electric vehicle sales penetration of 30% of private cars, 70% of commercial cars, 40% of buses and 80% of two- and three-wheelers by 2030.

This could lead to cumulative lifetimes' worth of oil and CO_2 savings, amounting to 5.4 million tons and 846 million tons respectively, deployed over vehicles' lifetimes.[3] The race is on to achieve the sustainable transition of India's economy and meet the needs of its young and fast-growing population.

Mobility offers opportunities for business growth and sustainability.

Even as India invests in public transport and infrastructure, the demand for personal mobility using two-, three- and four-wheelers is growing faster than the speed of deployment of mass transport. Public transport accounts for only a seven-percent share of the total trips in India.[4] Urban commuting has become one of the most energy- and pollution-intensive activities in India.

The government is actively promoting mobility electrification and the fast transformation of the mobility system, but such action alone will not shift adoption of electric vehicles fast enough if it is done unilaterally.

Commercial fleets – for employee transport, ride-hailing, home deliveries and other commercial and industrial applications – represent the fastest-growing segment of vehicles on Indian roads. The economics of the electric vehicle option for commercial users is improving quickly.

WBCSD is making business part of the solution for India's urban pollution and emissions challenges by mobilizing the entire value chain to accelerate the adoption of electric vehicles.

Our REmobility project brings together businesses representing over 10 billion kilometers of mobility in India, of which 250 million annual vehicle kilometers have been electrified.

Bringing together the combined experience and expertise of our members to suggest the consensus-based policy actions collated in this report was essential. We hope that this will initiate a long-lasting collaboration between policy and business actions that can make India a global leader on electric vehicle adoption.

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Executive summary

India wants to be a global leader in the manufacturing and adoption of electrified vehicles (EVs) and sees the energy transition in mobility as an important part of its emissions reduction, energy security and industrial strategies.

This decade will be crucial for India's ambitions. A slow uptake of EVs in the 2020s will mean tens of millions of additional combustion vehicles on Indian roads. For India, it will also mean lagging behind global peers in a strategic sector for manufacturing. India urgently needs a holistic policy approach that addresses the established automotive sector's concerns, creates market rules to build the new energy infrastructure, preserves and creates jobs, and fosters demand to accelerate technology adoption in order to fully capture the available economic opportunity.

India needs a robust national ambition alongside business leadership and action to achieve this once-in-a-lifetime transition. A strong ambition will set a clear direction and create long-term visibility. A national EV ambition along with a clear timeline and roadmap for implementation can provide certainty and galvanize action across policy and market.

India needs to focus on shared, clean, convenient, affordable and efficient mobility for all: Electrification alone is not the panacea, but shared, electric mobility is a key part of the solution. Given the low operational cost of EVs, higher utilization increases economic viability in terms of total cost of ownership – making them ideal for shared mobility options. Shared and electrified two-wheelers (2Ws), three-wheelers (3Ws), four-wheelers (4Ws) and buses can help make mobility affordable for 1.3 billion Indians.

Enhance policy and market collaboration across mobility, energy and real estate sectors: The potential value of the transition to EVs resides at the intersection of mobility, real estate and energy. These sectors working in silos will result in sub-optimal outcomes. A joint policy task force across these sectors will accelerate EV adoption and strengthen the business case for efficient electric fleets, effective space management, charging network creation and grid management. It is only when these sectors collaborate that large-scale capital can be attracted to this transition.

India is rightly focusing on fleet-led adoption and infrastructure build-up: India's national EV incentives scheme is structured to prioritize clean mobility vis-à-vis clean vehicles. The focus of the incentives scheme is on electrification of buses, commercial vehicles, 2Ws and 3Ws, and an effort led by the public sector to build the backbone of a robust charging infrastructure. The high utilization of commercial fleets makes them the ideal candidate to lead India's EV transition. Electrification of commercial fleets can provide the demand signal and scale required to attract manufacturing and R&D investments – allowing consumer adoption to follow.

India must enhance the scope, utilization and efficiency of its incentive scheme: Funds under India's primary EV incentive scheme, Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India (FAME), remain underutilized. There is an urgent need to review and overhaul the scheme. There is merit in expanding the scope of FAME to more fleet segments, such as private e-buses, corporate e-cars and battery swapping for 2Ws and 3Ws.

Focus on non-fiscal incentives to maximize impact with limited resources: Given India's multitude of priorities and limited public resources, all opportunities to encourage EV adoption without dipping into the public exchequer must be explored. Instituting Low-Emission Zones (LEZs) in congested urban centers, relaxing day-time municipal entry for electric urban freight and legalizing e-bike taxis are a few policy opportunities that will support early EV adoption without the need to expend resources.

Institute clear, unbiased regulations and market rules to enhance the ease of doing business: As businesses start to invest in the transition, they often find themselves in uncharted territory, where legacy regulations do not provide the intended social benefits but instead often become bottlenecks to growth. Policymakers must proactively resolve such challenges. Today, these challenges are most acute for setting up of charging infrastructure. Regulatory provisions must be created so as to set clear responsibilities for the costs to be incurred for the grid upgradation and real estate acquisition that are required to set up India's charging infrastructure and to define how these costs would be socialized.

Enable access to clean energy to power clean mobility: The transition to electric mobility makes the most sense when it is powered by renewable energy. Even as India increases the share of renewable energy on the grid under its ambitious international commitments, it must liberalize regulations for charging stations to aggregate demand and procure renewable power.

The recommendations proposed in this paper support the government's vision of encouraging clean kilometers over vehicle volumes. We emphasize the creation of market rules that will help attract the private investments required to build India's new energy infrastructure and prioritize business models that support shared mobility and enhance driver incomes across commercial fleets for deliveries and ride-hailing.

More than 30 businesses and experts from India's EV value chain co-created this policy paper. It provides consensus-based recommendations for policy improvement to accelerate adoption of EVs across commercial fleets and is based on inputs from early adopter businesses that are building solutions and investing in in the transition today.

We hope that this paper will help socialize the collated policy recommendations across India's EV value chain – but most importantly, enhance the collaboration between Indian policymakers and businesses.

1 Introduction

1 Introduction

Countries and vehicle manufacturers around the world are navigating an inevitable transition from internal combustion engine (ICE) vehicles to electric mobility. With global sales of just 2.6% in 2020, EVs are expected to account for nearly 57% of all vehicle sales by 2040.[5] The year 2020 was pivotal and saw Europe join China in the rapid uptake of EVs. As the rest of the world joins in, national and sub-national governments around the world are supporting this transition through policy measures, incentives and regulation as part of their emissions reduction, energy security and industrial strategies.

India is in the process of building an electric mobility ecosystem through its flagship FAME India scheme,[6] supported by several national and sub-national initiatives.

India has a strong policy foundation to support a transition to EVs. Capital incentives for EV adoption, performance-linked incentives (PLIs) for manufacturing, de-licensing of charging as a service, favorable indirect taxation for electric vehicles, direct tax benefits for individual owners of EVs and state-level EV policies across most large states form fertile ground for a fast transition.

As the government creates an enabling policy landscape, forward-looking businesses in India are stepping up to support the transition. Leading global and Indian businesses have announced plans for commercial fleet electrification, manufacturing and R&D initiatives and Indian businesses such as Flipkart, State Bank of India and Wipro have committed to the globally recognized EV100 targets.

As early EV adoption gathers momentum in India, this report collates inputs from businesses that are building solutions, making investments and adopting electric vehicles, to provide feedback on how policies can better support their efforts to accelerate the transition.

About FAME

India's national flagship incentive scheme for EV adoption is known as the Faster Adoption and Manufacturing of (Hybrid &) Electric vehicles (FAME) scheme. The second phase of scheme, i.e., FAME II, is structured to prioritize clean mobility vs clean vehicles. An outlay of INR 100 billion (USD $1.38 billion) has been allocated to encourage faster adoption of EVs and support deployment of charging infrastructure, over a three-year period (2019-22) by Department of Heavy Industries (DHI).

Given India's multitude of priorities and limited resources, this policy paper fully agrees with and acknowledges this policy approach.

Photo credits: Tata Power

This report considers how the FAME scheme can be evolved to make India a global electrification leader. However, the FAME policy alone is not the only policy solution to the broad array of challenges related to EV adoption. The report further provides inputs on non-FAME fiscal and non-fiscal measures to support new business models and address challenges linked with early adoption. It also captures best practices from city- and state-level policy innovations that can be scaled up to all regions of the country.

By liberalizing the scope of the FAME scheme to cover promising new high-utilization use cases and market segments where there is proven traction and a strong alignment with the government's vision of clean kilometers through shared mobility, India could enable higher fund utilization and result in compounded benefits for the entire ecosystem.

Two-thirds of the intended FAME II scheme duration has elapsed (as of March 2021), but a significant portion of the fund remains underutilized (as of April 2021).[7]

For example, private e-buses could be included within the ambit of the FAME scheme, as they constitute 90% of the entire bus fleet share in India, align with government vision and enjoy significant market traction from many service providers and corporate customers. Similarly, improving driver incomes by intervening in infrastructure requirements of last-mile connectivity; non-fiscal measures such as instituting low-emission zones, relaxing daytime entry restrictions for urban freight EVs, legalizing e-bike taxis and streamlining the licensing of e-bike rentals across states can encourage adoption and shift behavior. Definition of market rules for attracting private investment in charging can help build the infrastructure of tomorrow. Unbiased regulations to eliminate artificial distortions related to land allocations could enhance confidence among private charging businesses and spur investment. Remodeled regulations enabling renewable energy (RE) sourcing for the charging infrastructure can ensure that India's transition to electric mobility is powered using RE.

Enabling a faster transition requires collaboration between policymakers and the private sector. A nimble policy environment with a clear direction and purpose is key to a successful transformation. Such a transformation will not just enable the clean, safe, affordable and efficient movement of people and goods, it will create enormous economic, social and environmental benefits for the country. This report and WBCSD's REmobility project aim to foster this collaboration. WBCSD has been working with India's EV value chain under

Approach

its REmobility coalition with the objective of accelerating commercial fleet electrification. As part of our efforts, WBCSD introduced a how-to-guide for businesses looking to adopt EVs.[8] This document is a ready reckoner for businesses looking to adopt electric vehicles. It identifies employee transport, ride hailing and deliveries as the most prominent high-utilization use cases, ready for scaling up in the Indian context. A subsequent documentation of India's first all-electric car ride-hailing company, BluSmart,[9] was released in 2020 to support electrification of ride-hailing across all similar services in India and globally.

Both these reports emphasized how business leadership can capture the early EV adoption opportunity.

The present paper informs relevant policymakers on market feedback from early EV businesses adopters and describes how different policy interventions can accelerate EV adoption by businesses.

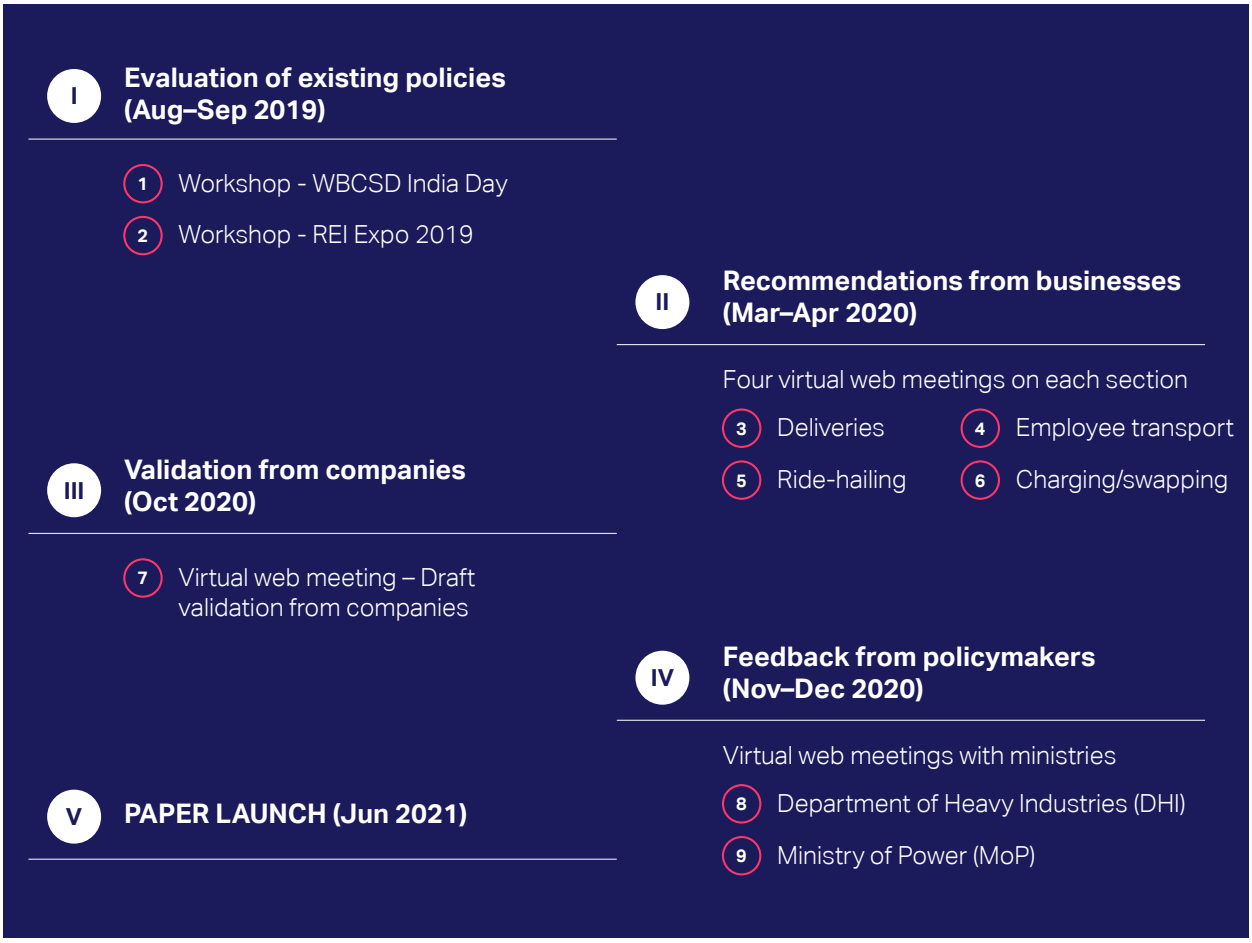
The selection of recommendations for this report ensures that:

- There is shared, balanced understanding and alignment on recommendations by businesses, after accounting for varying perspectives.
- High-impact and scalable use cases in proximity to economic viability are prioritized.
- Promising new business models are supported.
- Ease of doing business becomes a policy priority.
- Market rules support private investments and provide long-term certainty.
- Driver incomes are enhanced and new income opportunities are created across use cases.

Engagement timeline and process

In 2020, WBCSD convened more than 30 businesses and experts from across India's EV value chain to draw a set of high-level policy and regulatory recommendations that can help accelerate commercial fleet electrification in India and encourage private investments in the setting up of charging infrastructure. This paper is the product of a structured approach, including evaluation of the existing policy landscape, seeking recommendations from early adopters (businesses), validating the recommendations, presentation to relevant ministries and incorporation of policymakers' feedback, developed over a period of 1.5 years. The engagement timeline and process are illustrated in the figure below.

Figure 1: Policy paper engagement timeline and process



Scope

This report focuses on commercial fleet adoption and related charging/battery swapping infrastructure. It evaluates unaddressed barriers to commercial fleet electrification, identifies actionable policy and regulatory opportunities for policymakers, and intends to serve as a resource for India's transition towards electrifying fleets and increasing investments in charging infrastructure.

The report does not claim to be an all-inclusive coverage of policy recommendations on EV adoption in India and consciously focuses on policy or regulatory recommendations for a defined scope of certain users, technologies, markets, transportation modes and vehicle segments mentioned in the figure below (refer to the endnotes to read about the considerations behind their exclusions).[10]

Figure 2: Scope of the paper

	Within scope	Beyond scope
Transportation mode	Road transport	Non-road transport modes – aviation, shipping and railways. Also mining, construction and agriculture
Vehicle technology	Battery electric vehicles (BEVs)	Hybrid electric vehicles Hydrogen/fuel cell vehicles
Vehicle segments	2Ws, 3Ws (passenger, goods), 4Ws (cars), small/medium commercial vehicles (SCVs/MCVs) and buses	Heavy-duty freight vehicles, i.e., trucks (HCVs)
User segment	Fleet adoption (across high utilization use cases of ride-hailing, employee transport, urban freight and deliveries)	Personal transport Public transport
Market segment	Demand-side initiatives for fleets and charging point operators (CPOs)/battery swapping operators (BSOs) Service-related initiatives for charging/battery swapping	Manufacturing and other supply-side initiatives for original equipment manufacturers (OEMs) and component makers such as Make in India

Sections

This paper recommends a pool of 18 actionable policy and regulatory opportunities to accelerate commercial fleet electrification and deployment of related charging infrastructure. The recommendations presented in the paper are broadly classified into three distinct categories: (2) Foundational sector-wide recommendations, (3) EV charging infrastructure recommendations and (4) High-utilization use case-specific recommendations with the use cases defined in the scope above.

2. Foundational sector-wide recommendations

This section explores overarching recommendations that could lay the foundations for a profound transformation, across the EV ecosystem (primarily fleets) and address all use cases for EV adoption.

3. EV charging-related recommendations

Characteristics unique to commercial fleets – predictability of journeys/routes and constancy of daily trips – support planning and occupancy of associated infrastructure, which is an advantage for fleet adoption. This section explores policy and regulatory measures to create a competitive, scalable market for setting up charging/battery swapping infrastructure.

4. Use case-specific recommendations

This section explores policy and regulatory measures to accelerate EV adoption in three high-utilization use cases. Three of the most scalable use cases in India for fleet electrification, identified collaboratively by WBCSD's REmobility coalition, are employee transport, ride-hailing and urban freight/deliveries – also covered in WBCSD's earlier reports. These three use cases make a strong case for EV transition because of proximity to total cost of ownership (TCO) parity, high emissions/pollution reduction potential and greater alignment with FAME's existing focus on high-impact vehicle segments.

4a. Employee transport

Mobility service providers contracted by employers to transport employees. These service providers support corporate clients with any or all mobility purposes: airport ferries, ad hoc meetings and employee transport using cars and buses.

4b. Ride-hailing

App-based and conventional ride-hailing services, which operate in cities. This use case considers 2Ws, 3Ws and cars.

4c. Deliveries

Vehicle segments employed by logistics fleets, e-commerce companies, online food and grocery companies and more, for their last mile-deliveries. This use case considers 2Ws, 3Ws, SCVs and MCVs.

Analysis framework

The paper covers each of the recommendations following an analysis framework that has the following three layers:

(a) Context (WHAT): Identify fleet EV and related infrastructure development opportunities, examining the current landscape.

(b) Rationale (WHY): Understand market barriers for fleet EV uptake that could be addressed through policy or regulatory intervention, developing a robust rationale to pursue the recommendations for policymakers.

(c) Recommendations (HOW): Determine a policy or regulatory recommendation and, in a few cases, the mechanism for its implementation.

Classification of recommendations

Each recommendation in the report has been classified based on its type, presented through varying colored boxes, as illustrated.

(a) FAME-related recommendations: Policy instruments related to demand incentives, which directly help in demand generation of EVs and deployment of related infrastructure, by reducing the cost of acquisition.

(b) Non-FAME fiscal measures: Fiscal policy instruments other than FAME, given to institutions to ease the economic burden (such as relaxation in taxes), in the overall interest of society.

(c) Regulatory provisions: Rules and directives to mandate, encourage, enable, limit or otherwise direct subjects to act according to policy goals (for example, liberal regulations enable virtual power aggregation for charging stations to avail RE).

What do these colored boxes in the paper represent?

Recommendations based on their nature/type

- FAME-related recommendations
- Non-FAME fiscal measures
- Regulatory provisions

Summary: Actionable opportunities

This table lays down 18 actionable policy and regulatory opportunities to accelerate commercial fleet electrification and deployment of related charging infrastructure, divided into three sections. It also classifies each recommendation based on its type/nature, its applicability to relevant vehicle segments and its relevance to key government stakeholders. Interventions listed here are detailed in the subsequent chapters.

S. No.	Recommendations	Vehicle segments	Key govt. stakeholder	FAME incentives	Non-FAME fiscal measures	Regulatory provisions
(2) Foundational sector-wide recommendations [F]						
F1	Set out a national EV ambition					
F2	ICE vehicle scrapping incentives linked to EV adoption					
F3	Provide EV leasing with a level playing field with respect to EV buying					
F4	Institute low-emission zones (LEZs)					
F5	Exemptions, discounts and incentives to EVs					
(3) EV charging-related recommendations [CI]						
CI1	Support market creation for private charging investments	All	MoP, DISCOMs	✓		✓
CI2	Facilitate allocation of affordable and accessible land parcels for private investors for charging operators in cities	All	ULBs			✓
CI3	Permit battery swapping to allow access to FAME subsidy and EV tariff	2W, 3W	MoP	✓		✓
CI4	Reduce GST on charging and battery swapping services	All	MoF		✓	
CI5	Liberal regulations enabling virtual power aggregation and/or lower open access threshold for charging stations to avail RE	All	MoP			✓

S. No.	Recommendations	Vehicle segments	Key govt. stakeholder	FAME incentives	Non-FAME fiscal measures	Regulatory provisions
(4a) Use case 1: Employee transport [E]						
E1	Include privately operated e-buses within the ambit of the FAME II scheme	Bus	DHI	✓		
E2	Extend FAME subsidies to institutional and corporate buyers for e-cars	4W	DHI	✓		
(4b) Use case 2: Ride-hailing [R]						
R1	Legalize e-bike taxis and streamline licensing of e-bike rentals across states	2W	MoRTH, RTOs	✓		
R2	Waive toll fees and airport charges for EV taxis	4W	MoRTH		✓	
(4c) Use case 3: Deliveries [D]						
D1	Experiment with daytime entry of electric SCVs and MCVs into cities for a timebound period	SCV, MCV	ULBs			✓
D2	Allocate FAME funds to subsidize certified retrofitting kits for electric SCVs and MCVs for a timebound period	SCV, MCV, HCV	DHI, MoF, MoRTH	✓	✓	✓
D3	Enable permit flexibility for usage of e-2Ws across use cases	2W	MoRTH			✓
D4	Consult and revise regulations for e-2Ws related to motor power ratings and OEM licensing structure	2W	ARAI			✓

2 Foundational sector-wide policy recommendations

Photo credits: Lithium

② Foundational sector-wide policy recommendations

F1. Set out a national EV ambition

SETTING TARGETS AND MANDATES AS THE CORNERSTONE OF THE EV ADOPTION STRATEGY

Rationale

A national target and commitment have made India a global leader in RE. To keep the country's auto sector competitive and reduce emissions, India must invest in electrification. Businesses look to governments to provide consistent, ambitious targets and clear timelines to give them clarity and confidence on the way forward. **While recent Indian EV policy advancements are encouraging electrification, the absence of ambition and mandates leaves ambiguity about the rate at which the Indian government is envisioning the EV transition.**

Road transport emissions in India, accounting for 87% of transport sector greenhouse gas (GHG) emissions today, are expected to increase by more than 500% by 2030 (compared to 2005 levels).[11] Also, India's combined import bill for fossil fuels is expected to triple over next two decades, with oil for road transport being the largest component, pointing to continued risks to the country's energy security.[12]

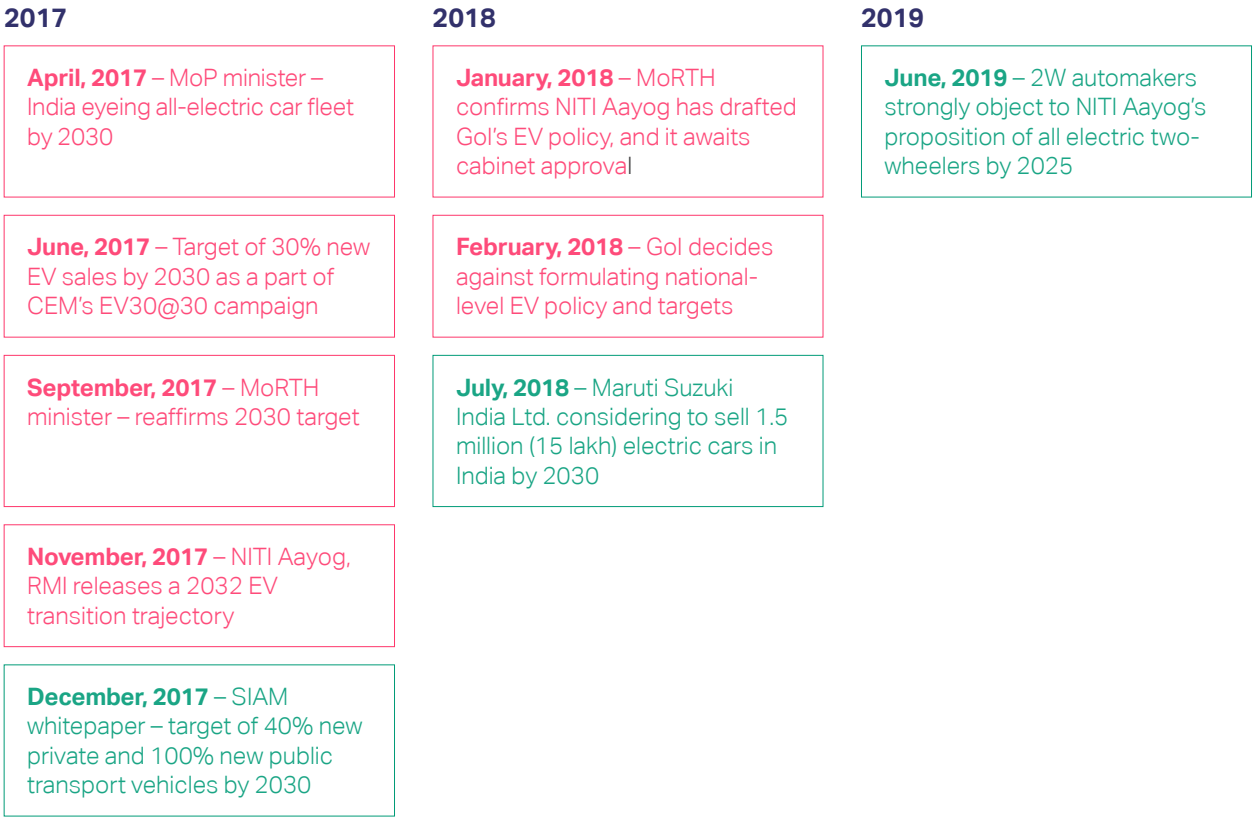
A national EV ambition, along with a roadmap for implementation, will provide clarity and set the path for a successful transition. India is already a signatory of Clean Energy Ministerial's (CEM) EV30@30 campaign, with an objective of a 30% new sales share for EVs by 2030.

Global precedence

Globally, 17 countries have announced 100% zero-emission vehicle (ZEV) targets or phase-out targets of ICE vehicles through 2050.[13]

Figure 3: Global EV ambition or ICE phase-out timeline[13]

Figure 4: Summary of India's EV ambition announcements



India is yet to come up with a national-level EV target, that is supported by regulatory framework of mechanisms. Past announcements and efforts between ministries and private bodies have been un-coordinated and subject to revisions

Recommendation(s)

Formulate and announce a national EV target

There is a need for an open-minded collaboration between businesses and governments to formulate India's EV ambition. Putting together an EV ambition statement should be a part of a larger industry dialogue that considers a systemic transformation towards sustainable mobility, including deliberating on the role of private and shared mobility in India's transportation future, improving access and efficiency through better planning for space and public transport infrastructure, promoting modal shifts to more sustainable options and managing the overall transition to sustainable mobility through development of a national roadmap for action.

To galvanize investment and business action specific to accelerated deployment of shared electric mobility, the Indian government should consider announcing an ambitious national commitment. WBCSD and its partner for electric mobility ambition and action in India, The Climate Group, are engaging companies in the EV ecosystem to formulate and align on an EV ambition that can act as a catalyst and support the Indian government to announce an EV-specific ambition. The 2021 United Nations Climate Change Conference, also known as COP26, scheduled in November 2021, could be a suitable platform for India to unveil its national-level, long-term EV ambitions.

A starting point (base case) towards formulating an ambition could be the recommendation made by the Society of Indian Automobile Manufacturers (SIAM)[14] in 2017, i.e., electrification of 40% of new sales in the 2W, 3W and car vehicle segments and 100% of public intracity vehicles by 2030. It could further consider 100% electrification of new sales of commercial fleet vehicles by 2025 as its North Star ambition,[15] in the 2W, 3W, car and bus vehicle segments. We believe that a more ambitious target is both pragmatic and advantageous as it will help galvanize investments required for a now-inevitable energy transition in mobility.

F2. ICE vehicle scrapping incentives linked to EV adoption

GENERATING DEMAND FOR EVs THROUGH SCRAPPING OLD ICE VEHICLES

Rationale

As many as 22 million ICE vehicles will reach end-of-life between 2019 and 2025.[16] Government-budgeted scrappage programs are widely adopted across the world to eliminate polluting and inefficient vehicles from the road. The nature of incentives to promote replacement (scrappage) of old vehicles varies, ranging from cash grants (Austria), public transit passes (Canada), rebates on purchase of new cleaner vehicles, i.e., compressed natural gas (CNG), electric or hydrogen (Italy) and many others. Both the amount and nature of financial incentives determine participation. Linking vehicle scrappage with the purchase of EVs serves the dual purpose of managing the current fleet of old ICE vehicles while accelerating EV penetration.[17]

The Indian government has recently announced its vehicle scrappage policy in the 2021 budget, the details of which are expected to be unveiled soon. The Ministry of Road Transport and Highways (MoRTH) released a draft 'Consultation note on scrapping of commercial vehicles' in 2018. The note is suggestive of applicability of FAME incentives on the purchase of new EVs against scrapped ICE vehicles.[18]

Global precedence

France - In 2014, France launched a scrappage scheme where the government offered a discount of INR 0.35 million or USD $4,500 (5–10% of the average EV price) against the price of a new EV and INR 0.25 million or USD $3,400 for new plug-in hybrid EV (PHEV) if the vehicle being scrapped was over 13 years old.

USA - The USA announced a Cash for Clunkers-type plan of USD $454 billion over 10 years to offer incentives to trade in gas cars for electric, hybrid or hydrogen fuel cell vehicles.[19]

Recommendation(s)

Provide subsidy for old ICE vehicle replacement (scrappage) against the purchase of new EV

Given that fleet operators are major buyers of vehicles and that their fleets reach end of life (EoL) early compared to individual users on account of higher utilization rates, extending such incentives to fleet operators ensures a faster transition to e-mobility.[17]

F3. Provide EV leasing with a level playing field with respect to EV buying

ENCOURAGING NEW OWNERSHIP MODELS THAT FACILITATE FASTER EV ADOPTION

Rationale

Vehicle 'usership' is growing prevalence around the world over vehicle 'ownership'. Corporates are relying on financially and operationally leased vehicles across use cases, as they realize savings in operations. E-mobility compounded with leasing could support corporates in meeting their sustainability goals, reduce the burden of upfront investments, avail operational cost savings and address short-term technology risks associated with the values of EVs. Companies in India such as LeasePlan and Energy Efficiency Services Limited (EESL) have pioneered EV leasing models and taken the lead in enabling this transition.

Right now, leasing companies in India do not benefit from EV-related subsidies or fiscal support. The future residual (resale) value of EVs is practically a black box in this nascent market. A key concern for leasing companies has been the high risks associated with the future marketability of available products.

Supportive government policies can create a higher risk appetite among leasing companies in financing the products that the market has to offer. This could catalyze growth of EVs among corporates.

Global precedence

Hotspots for EV leasing are majorly developed markets such as Europe (Belgium, Luxembourg, Netherlands and Sweden) and the USA, where both original equipment manufacturers (OEMs), such as BMW, Volkswagen and Volvo, and leasing companies, such as LeasePlan, ELD Electric, Go Arval Electric and AlphaElectric, are expanding operations.[20]

Recommendation(s)

Encourage leasing of EVs amongst corporates through policy support

- Leasing should be recognized as a valid mode of financing, and incentives such as subsidies and tax breaks that are applicable on EV loans could be extended to companies procuring EVs for the purposes of corporate leasing.
- Leasing companies assume the resale risk of EVs and promote EVs through their financial and operational leasing services. They should benefit from favorable interest rates and attractive financial products. This benefit would trickle down to end-users and customers as well.
- Most leased vehicles are registered as commercial. The charges for reselling vehicles to private use are substantial – this hampers the viability of a healthy resale market. Therefore, resale charges should be waived for leased EVs moving to the private market at the end of lease period.
- A new section 80EEB was introduced in the union budget 2019 allowing a deduction for interest paid on loans taken for the purchase of EVs for individuals. Income tax benefits under this section should be extended to corporates, which would make leasing EVs an attractive proposition for them.

F4. Institute low-emission zones (LEZs)

TACKLING LOCAL POLLUTION AND EMISSIONS IN CITY CENTERS

Rationale

The relative advantage of EVs can be highly transformed by creating a situation where the access of emitting vehicles is restricted. 21 out of the top 30 most polluted cities in the world are in India.[21] LEZs provide a targeted way to combat air quality and pollution problems that are worsening the state of urban core cities and imposing significant economic costs to health of citizens.

Global precedence

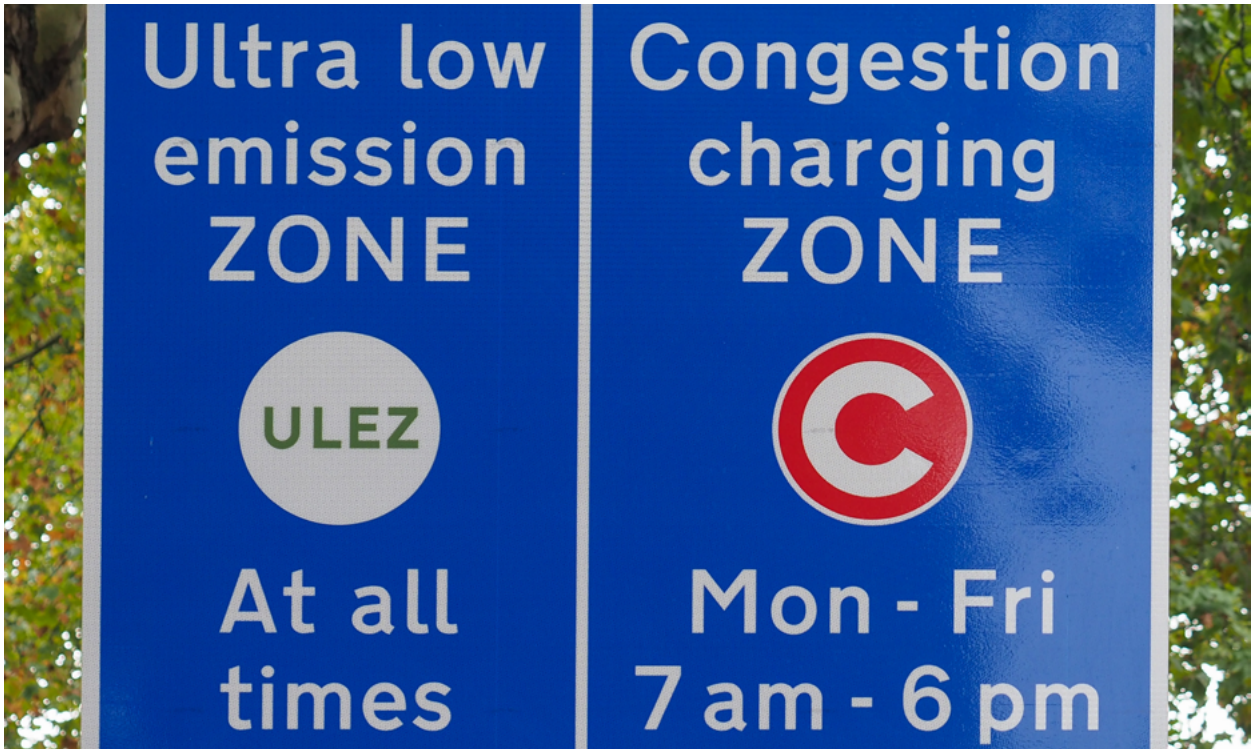
Paris, France - The movement of emitting vehicles is restricted temporarily or permanently in certain zones depending on the air quality values.[22] The penalties for violation range from INR 6,000 to INR 33,500 (USD $82 to USD $450) and vary according to vehicle type and the fuel standards that need to be met.

London, UK - The LEZ in London encourages the most polluting heavy diesel vehicles to become cleaner. Penalties are imposed on vehicles not meeting the LEZ standards.[23] Most EVs are exempted from congestion charges levied for entering the city on weekdays.

Recommendation(s)

Implement LEZs in focus cities with underlying elements such as:

- Designate congested markets and commercial streets as LEZs across major cities across India.
- Introduce phased fuel standards that need to be met in LEZs (EVs being exempt).
- Introduce congestion pricing/fees for ICE vehicles to operate in LEZs where required.



F5. Exemptions, discounts and incentives to EVs

MEASURES TOWARDS IMPROVING EV COST COMPETITIVENESS

Rationale

The government should introduce an array of measures improving the cost competitiveness of EVs, to reduce the upfront cost disadvantage. These measures include providing financial and nonfinancial incentives, disincentivizing ICE vehicles through taxation and offering EV exemptions such as tax and toll waivers, all of which can reduce the upfront purchase cost of EVs. Some of the measures announced in India at the central and state levels include:

- GST reduction for EVs from 12% to 5% and for EV chargers from 18% to 5%
- Green registration plates for ZEVs for distinct identity
- State-led measures such as road tax waivers, free EV parking, registration tax waivers and discounted EV tariffs

All these regulations, accompanied by the recommendations below, should be adopted uniformly across all Indian states.

Global precedence

Some of the top EV markets in the world reveal a strong reliance on exemptions in the early stages of growth:

Norway - EVs benefit from free parking and value-added tax (VAT) exemptions.[24]

Denmark - EVs are exempted from registration tax.[24]

China - EVs are exempted from sales tax.[25]

Recommendation(s)

State-level actions:

- Uniform implementation of national schemes across states
- Road tax waivers, free EV parking, registration tax waivers, concession/exemption from road tolls, subsidized electricity for charging and dedicated pick-up/drop points for EVs such as taxis and delivery vehicles. A financing mechanism similar to the one proposed in the Delhi EV policy[26] could be followed, i.e., creation of an umbrella, non-lapsable 'state EV fund' that is to be financed through additional taxes/cesses on polluting vehicles, such as a pollution cess, road tax or congestion fee.

National-level actions:

- Waiver of Social Welfare Surcharge (SWS) on import of EVs
- Ranking the states on an "EV attractiveness index" based on the above parameters

3 EV charging-related policy recommendations

③ EV charging-related policy recommendations

EV fueling is an activity that is integral to operating EVs. Lack of accessible charging/swapping infrastructure is one of the top barriers to EV adoption in developing EV markets such as India[27] – a survey conducted by Volvo Cars-Harris revealed that a robust charging infrastructure network is the most important enabler to procure EVs. Hence, deployment of an accessible, available and affordable charging network in India is instrumental for any electrification ambitions in the transportation sector.

Charging infrastructure in India is still in its infancy. The FAME II scheme launched in 2019 had an initial outlay of INR 10 billion (USD $138 million) to support the installation of charging infrastructure. The central and state governments are encouraging central and state public sector undertakings (PSUs), state power distribution companies (DISCOMs) and other public agencies, including urban local bodies (ULBs) and urban/area development authorities, to support the establishment of public charging facilities. Public entities such as Energy Efficiency Services Limited (EESL), National Thermal Power Corporation (NTPC) and state power distribution utilities have already taken some initiatives to this end. While most chargers have been set up in cities, the government has also focused on deployment on highways and expressways.

The central and state governments in their continued effort to support the creation of charging infrastructure have made steady progress on policies and regulations. For example: (a) delicensing of EV charging infrastructure by the Ministry of Power (MoP) to create a scalable competitive market; (b) provision for 20% parking space reservation for EV charging in new establishments by the Ministry of Housing and Urban Affairs (MoHUA) through the model building bylaws; (c) recognition of battery swapping as a mode of charging by MoP and more.

Despite the involvement of the aforementioned entities, several challenges remain with respect to planning, deployment and operations of charging infrastructure, which have resulted in slower progress than required. The challenges included in this section are related to unclear market rules on grid upgradation; uncertain grid upgradation timelines and artificial distortions related to land hindering private investments in charging; absence of subsidy support to battery swapping; double taxation levied on charging services; and operational difficulties related to the open-access regulation threshold. This section covers recommendations across various aspects of the charging infrastructure and battery swapping landscape that could catalyze the progress already made on deployment and operations.

CI1. Support market creation for private charging investments

INSTITUTING CLEAR MARKET RULES TO SET UP CHARGING INFRASTRUCTURE

Context

EV charging is a new domain for many of the public and private entities, which presents challenges in defining unbiased market rules that create public good. Various issues directly influence the ease of doing business with respect to installation or operation of charging infrastructure.

A key issue related to charging infrastructure is the lack of market rules around setting out responsibilities in terms of who pays for the grid upgradation – the fleet operator, the real estate owner, the charging point operator (CPO)/battery swapping operator (BSO) or the DISCOM. It is important that this grid upgradation capital cost be socialized in the short term and recovered through profitable sale of power in the longer term. Transferring the entire burden to CPOs/ BSOs or fleet operators will be detrimental to the transition.

Revisiting governing market rules and instituting clear guidelines for both DISCOMs and fleet operators/CPOs/BSOs may accelerate the installation of EV charging networks in the country.

Photo credits: Tata Power

Rationale

Subject	Rationale
Market rules: grid upgradation cost	• FAME does not earmark any financial assistance to DISCOMs or CPOs with regard to grid upgradation. In the absence of transparent market rules or any financial support, the operators are compelled to pay for all upgradation costs on instances, disregarding who owns the asset. The quantum of cost is sometimes as high as the total cost of charging infrastructure altogether. • Parallelly, DISCOMs face an infrastructure challenge, that is not supportive of adding incremental load onto the system and requires them to invest heavily.
Market rules: low tension (LT) threshold	• There are two types of connections – Low Tension (LT) and High Tension (HT), the thresholds of which vary across states. For states like Haryana, the LT threshold is 50 kW,[28] while it is as high as 200 kW for states like Delhi.[29] • As per LT regulations, DISCOMs are not expected to charge the applicant for grid upgradation, except for a nominal development charge if the concerned load is below the LT threshold. • Fleet operations require setting up of a good quantum of chargers (both fast and slow). However, states having an LT threshold of ~50 kW allow for only three DC001 chargers of 15 kW each, compelling the CPOs and fleet operators to bear the expenses for an HT connection if they wish to set up more than three such chargers. These additional expenses burden operators financially.
Uncertain timelines	• The service level agreements (SLAs) for grid upgradation are often not defined and the time taken by some DISCOMs is as long as six months. • This affects project timelines and project costs negatively, primarily owing to the high unutilized leased land rentals.
Commercial hubs and workplaces	• In August 2019, DHI invited proposals from PSUs, ULBs, private charging operators and others to set up public charging stations in cities. As per the expression of interest (EoI), three types of applications were considered:[30] Category A covered stations at public places used for commercial purposes, including parking lots, petrol pumps, malls and market complexes; Category B covered stations at government offices; and Category C covered stations for commercial use at semi-restricted locations (for example, stations set up by taxi operators). As per the DHI, charging stations installed in such locations can avail of EV tariffs. • Commercial hubs and workplaces may fall under Category A or C. While these sites can avail of EV tariffs, setting up separate meters and connections for chargers has proven to be challenging. In addition, big commercial hubs and workplaces often procure (captive) power through open access, thus increasing the complexity for DISCOMs to set up separate metered connections for charging infrastructure.

Recommendation(s)

Market rules – grid upgradation: The MoP could explore new models of financing the required grid upgrades (For example, democratization or sharing mechanisms to share the upgrade costs).

Market rules – LT threshold: The MoP could consider increasing the threshold of LT connections for EV charging to 200 kW across states, through issuing an advisory to the forum of regulators (FoR), the central electricity regulatory commission (CERC) and state electricity regulatory commissions (SERCs).

Uncertain timelines: DISCOMs should define the SLAs and maximum timelines for grid upgradation.

Commercial hubs and workplaces: The MoP should support and facilitate extension of separate EV connections to commercial hubs and workplaces.

Market rules – grid upgradation: DHI should consider facilitating cabinet approvals and amendments to the FAME scheme, re-appropriating a portion of funds allocated for charging towards DISCOMs aimed at funding the grid upgradation cost required for setting up the charging infrastructure.

AND/OR

The MoP should consider providing funds to DISCOMs through the Integrated Power Development Scheme (IPDS), or other means, to support the grid augmentation required for large-scale installation of charging infrastructure.

There is an existing global precedent that can be reviewed by the government: the US Department of Energy's Technical Assistance Grants to set up charging infrastructure. The Clean Cities Program offered technical assistance grants to cities to develop EV charging infrastructure plans.

CI2. Facilitate allocation of affordable and accessible land parcels for private investors for charging operators in cities

ENABLING A LEVEL PLAYING FIELD FOR ALL COMPETITORS IN THE CHARGING BUSINESS

Context

The early stages of the market have observed a lack of accessible and affordable land for CPOs where chargers can be set up for optimal utilization by fleets and personal users. Fleet operators or CPOs are required to undergo lengthy processes for permissions and approvals from DISCOMs and ULBs to set up charging points at optimal locations. Private investors face a challenge in getting good locations at suitable prices. Due to regulatory distortions, CPOs and fleet operators are often left with the choice of commercial real estate locations to set up charging infrastructure, where the value and cost of land is high.

In the DHI's phase I of tendering of subsidy for charging infrastructure in cities, private companies were mandated to have a prior MoU with location owners that meant routing applications through local city authorities. However, the process for competing PSUs in the tender was eased out, wherein they were allowed to send applications to DHI the without the need for well tied up contracts. Additionally, most PSUs benefit from having captive land parcels in cities.

For the market to spur private investments, there is a need to eliminate such artificial distortions and establish a level playing field for all competitors to access affordable land parcels.

Rationale

- Land rentals and leases form a considerable cost component for CPOs. They increase the delivered cost of power to end users and further diminish the business case for charging operators in the short term.
- The lack of affordable land pockets and the high associated cost of grid upgradation are two of the top challenges for charging companies and fleets. Policy support to allocate favorable land parcels for chargers could attract private investment and initiative at a greater scale.

Recommendation(s)

ULBs should earmark land parcels for charging infrastructure and/or allocate land to both government and private agencies assuming consistent parameters. Either approach could be followed:

- Government-owned locations for charging stations could be earmarked by the local administration through consultations with industry (CPOs and fleet operators).
- ULBs could organize competitive bids, similar to those for parking operators in cities, for CPOs, both private and government-owned, to set up charging infrastructure on ULB-owned land parcels; favorable land rentals could also be used as incentives for CPOs to invest in charging infrastructure.

CI3. Permit battery swapping to allow access to FAME subsidy and EV tariff

ADOPTING A TECHNOLOGY-AGNOSTIC STANCE ON EV FUELING

Context

India is a 2W- and 3W-dominant market. In FY20, 2W and 3W sales made up ~85% of total domestic motor vehicle sales.[31] India's electrification ambitions will, in large part, focus on these segments. Refueling time has been an Achilles' heel for commercial applications of EVs. While automakers and charging companies now offer rapid charging, this issue still impedes the efficiency of commercial fleet operations, for whom higher driver wait time (idle time) during peak operations inhibits drivers' earning opportunities.

Battery swapping is an attractive proposition in high-demand areas where the opportunity cost for charging downtime is significant. It is a proven enabler for 2W electrification in markets such has Taiwan.[32] **India can lead the global market in battery swapping technology; wide-scale adoption could also make India an exporter of technology and expertise. Battery swapping can enable adoption of electric 2W and 3W across use cases such as deliveries, ride-hailing, bike/scooter rentals and others.**

Like direct (conventional) charging, a precursor to incentivizing battery swapping should be standardizing the technology itself and developing protocols for handling and setting up stations (communication protocols, connectors, voltage, etc.). This will alleviate policymakers' uncertainties around standards, performance and safety of proven technology.

Photo credits: SUN Mobility

The following table lays down the policy advancements on battery swapping technology over time.

Segment	Current scenario
FAME II	• The 2W and 3W vehicle segments together account for 50% of the total FAME II subsidy package for vehicles. However, for charging infrastructure, most of the fund allocation is set to go towards chargers suited only for the car vehicle segment (as high-powered DC chargers are not suitable for 2W and 3W). • Battery swapping has not been included within the ambit of the INR 10 billion (USD $138 million) charging infrastructure subsidy package in the FAME II scheme. Providing subsidies to only direct charging technology limits the transition opportunity for high-utilization, convenient, quick and proven battery swapping models.
MoP Guidelines[33]	• The MoP in June 2020 issued revised guidelines and standards for EV charging infrastructure, officially recognizing battery swapping as a mode of charging, deeming battery charging stations (swap stations) at par with conventional charging stations. • The guidelines also apply to state governments. Many of the existing state EV policies do not recognize battery swapping, and so they fail to provide the necessary regulatory support to battery swapping operators (BSO).
Sale of EVs w/o batteries	• In August 2020, the MoRTH allowed sale and registration of electric 2W and 3Ws without batteries.[34]

In 2019, the Federation of Indian Chambers of Commerce & Industry (FICCI) submitted a detailed position paper[35] to the DHI recommending the inclusion of battery swapping within the ambit of FAME II. The paper helps to understand how the industry has previously represented the recommendation.

Rationale

Figure 5: Value proposition for stakeholders through battery swapping

	Benefits
Drivers/fleet operators	• Drastically reduced wait time of under 5 minutes compared to 1-1.5 hours of conventional fast charging • Higher daily utilization of 140 -160 km/day against fixed battery achieving 90-100 km/day due to charging downtime • Increased driver earnings • Reduced upfront cost enabling demand, as the battery, which constitutes 30-50% of the total EV cost, is separated from the vehicle • Lowered swapping (fueling) fee on account of increased productivity of land
Power companies/ DISCOMs	• Supports demand load balancing as batteries can be charged during non-peak hours • Provide an energy storage solution as batteries can store RE during its generation peak
BSOs/Energy operators	• Increased battery life due to controlled charging conditions • Improved land utilization and increased revenue

Recommendation(s)

The DHI should facilitate cabinet amendments to the FAME II scheme to include battery swapping:

Battery swapping should be included in the ambit of the FAME II scheme. The subsidy for swappable batteries could continue to remain at INR 10,000 (USD $138) per kWh, the same as for fixed batteries in conventional EVs.

CERC and SERCs should release clarifications on EV tariffs for battery swapping operators:

While the MoP's guidelines officially recognize battery swapping as a mode of charging, swapping operators still face issues in availing EV tariffs in some states; most receive a delivered cost of electricity close to INR 9–10 (USD $0.12–0.14) per unit. CERC and SERCs, hence, should notify DISCOMs to facilitate EV tariffs for battery swapping operations.

Also, battery swapping should be acknowledged as a mode of charging in the state EV policies as well.

CI4. Reduce GST on charging and battery swapping services

EXTENDING CONSISTENT FISCAL BENEFITS TO EVS TO INCREASE AFFORDABILITY

Context

The current GST applicable on EVs and electric vehicle supply equipment (EVSE) is 5%. In addition, GST applicable on services such as ride-hailing is 5%.[36] However, the GST on EV charging and battery swapping as a service is 18%. This can be reduced to 5% as well, to facilitate investments and early adoption.

Photo credits: Ola Mobility Institute

Rationale

A key component in the operational costs of EVs is the power expense/service paid by users for charging or swapping batteries in their vehicles. This cost is significant, especially in high-utilization cases, where 2/3Ws may swap 2–3 times a day and charge their batteries fully 1–2 times a day. **Electricity already fetches taxes in the form of electricity duty. This results in double taxation when coupled with taxes on EV charging and battery swapping services.**

Levying a tax of 18% on charging/swapping services increases the operating cost of vehicles, adversely impacting the economic viability of EVs. Such a regimen disproportionately affects auto drivers and delivery personnel, who are at the lower end of the income segment. Additionally, upon discounting the taxes on services, the loss of revenue for the government associated with reducing GST on charging/swapping services could be recovered through a financing mechanism proposed in recommendation F5.

Recommendation(s)

The Ministry of Finance (MoF) should rationalize the GST rate applicable on charging- and battery swapping-as-a-service:

Charging- and battery swapping-as-a-service should be moved to a lower GST bracket of 5%.

CI5. Liberal regulations enabling virtual power aggregation and/or lower open-access threshold for charging stations to avail RE

ENABLE ACCESS TO CLEAN ENERGY TO POWER CLEAN MOBILITY

Context

The Government of India (GoI) has rightly encouraged the adoption of RE to power EVs, through the Draft Electricity Amendment Bill. It is essential that the two dots of RE and EV connect, to derive maximum value from the EV transition. While multiple mechanisms to avail RE-sourced energy for charging exist, in the form of open access and on-site RE, fleet operators/CPOs/BSOs often face difficulty in accessing these mechanisms, as described below.

Mechanisms	Challenges
Open access: Open access norms allow use of RE for loads greater than 1 MW	**Challenges to operators** • Charging demand is expected to be scattered and disaggregated. With the current utilization levels, it is a difficult proposition to achieve the 1 MW open access threshold for contracted demand for operators. • Operators must, per regulation, schedule demand in advance; this is an added difficulty for operators. **Challenges to DISCOMs** • DISCOMs will have to cater to real-time deviations caused by operators' varying demand, and bear penalties as per the universal service obligation (USO) • Net-metered operators who also choose to avail RE through open access may encounter accounting and grid security issues. • High-end consumers moving to open access may drive up differences in commercial and subsidized tariffs, which may compromise revenue security for DISCOMs.
On-site RE: After the Delhi Electricity Regulatory Commission (DERC) policy on virtual net metering,[37] operators can consider rooftop solar and storage options to complement their power requirements	• Chargers may not always be set up at conventional stations where rooftops for solar is available. • The upfront investment and the scale required reduces the economic viability of the projects.

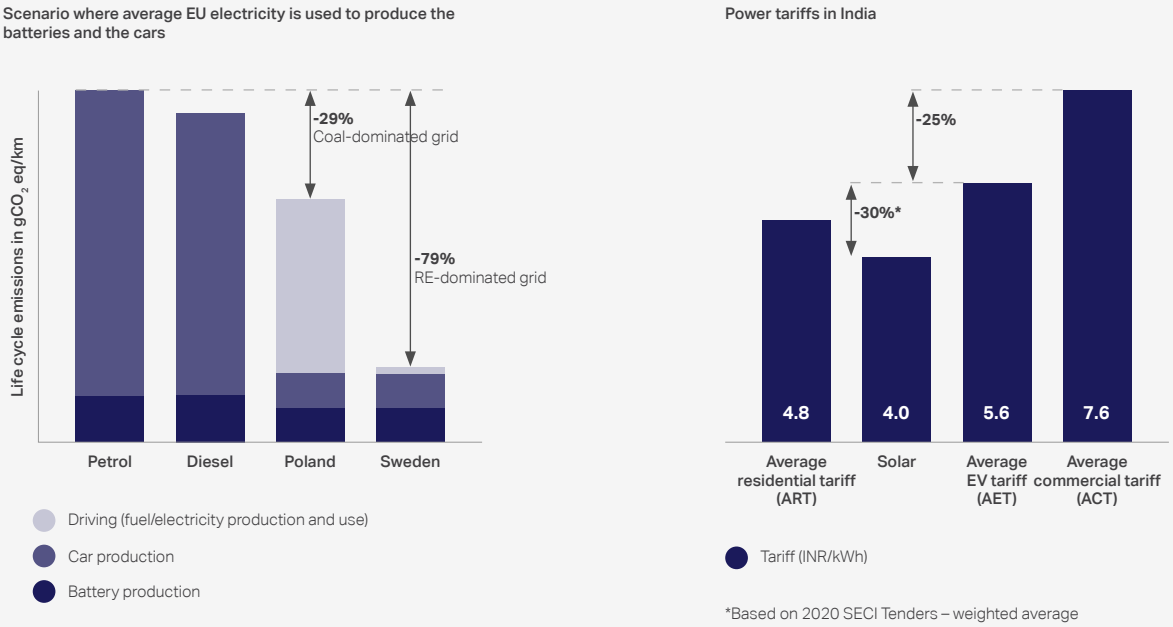
Rationale

RE-sourced EV charging offers two major benefits:

Reduced lifetime emissions of EVs globally: The lifetime carbon dioxide (CO_2) emissions of EVs are about 22% lower than diesel cars and 28% lower than petrol cars, even when they are driven and manufactured in a coal-dominant grid such as Poland's. The lifetime emissions have been reduced to a substantial 79% compared to ICE vehicles by transitioning to a renewables-dominated grid such as Sweden's.[38]

Further reduction in power tariff for operators over commercial tariff: In the long run, with the increase in charger utilization, cheaper RE could be an important lever in reducing energy expense, compared to the current commercial/EV tariff drawn by operators. The average EV tariff (AET) in India across the states is INR 5.6 (USD $0.08) per unit, while the average residential tariff (ART) and average commercial tariff (ACT) are INR 4.8 (USD $0.07) and INR 7.6 (USD $0.10) per unit respectively. In 2020, solar tariffs averaged between INR 3.5 to INR 4 (USD $0.05–0.06) per unit (subject to open access charges).

Figure 6: Impact of RE on life cycle emissions and power tariff[38]



Recommendation(s)

SERCs and DISCOMs should allow virtual demand aggregation of smaller charging stations to avail RE through open access:

- CERC, FoR and SERCs should develop load management guidelines and consumption accounting guidelines for virtually aggregated CPOs/BSOs/fleet operators.
- DISCOMs should implement procedures of load management, consumption accounting and installation of smart meters for operators' charging loads.
- Further, virtual accounting for operators to avail RE within the same DISCOM network or inter-DISCOM networks could be encouraged. This may lead to more DISCOMs meeting the renewable purchase obligation (RPO).

AND/OR

CERC and SERCs should explore regulatory mechanisms to lower the open access threshold of 1 MW for charging stations, so that stand-alone stations or virtually aggregated networks can achieve the threshold and avail RE:

The mechanism should also support DISCOMs. This could be facilitated through the following measures:

- Allay technical constraints: The USO could be reviewed for open access – operators and DISCOMs could both be responsible for managing load.
- Allay accounting constraints: Open access and net metering with EV charging could pose accounting issues. Providing open access and net metering to the same consumers could be reviewed.
- Revenue security: Required tariff rationalization and transparent open access charges could be determined by eliminating subsidies.

4a Use case-specific policy recommendations – employee transport

4a Use case-specific policy recommendations – employee transport

As India's urban areas expand in terms of population and workforce, the lack of reliable public transportation systems and passenger safety concerns has given birth to a burgeoning corporate employee transport ecosystem. The large outsourcing services industry (IT/BPO) has been a major contributor towards the growth of employee transportation services (ETS). ETS forms 23% of the pan-India taxi market, estimated to be worth USD $3.5 billion (as of 2017). The ETS market is projected to grow at 13.7% (compounded annual growth rate or CAGR), primarily consisting of cars and buses. While COVID-19 proved to be a tipping point for many forms of people and goods mobility, the ETS sector was most disrupted, as most service sector employees shifted to remote working. However, the post-pandemic shifts are expected to be positive overall as a return to office working is inevitable in many ways.

Today, the workforces in cities demand mobility services that are clean, efficient, fast, accessible and safe. With India becoming the largest offshoring destination, the ETS sector has a critical role in determining the ways in which urban mobility systems evolve, one of which could be the transitioning of fleets to EVs.

Companies such as Google, Amex, Accenture, Wipro and Adobe are known to have deployed EVs for their employee transport requirements across major Indian cities. This in turn is supporting the creation of an independent electric mobility ecosystem with business investments in electric fleets and charging infrastructure and the emergence of new mobility business models. Service providers in the employee transport ecosystem such as eee-taxi, Lithium Urban, Shuttl, Glyd and rydS are emerging with innovative models and solutions for customers.

Electrification of employee transport is aligned to the government's vision of clean and shared mobility. While many companies (both services and corporate customers), having tested the waters, can corroborate the business viability argument for EVs, many other companies remain on the sidelines, primarily due to a lack of subsidy support for certain vehicle segments. Policymakers have a vital role in enabling this transition and realizing the latent EV demand through policy measures. This section highlights the need and measures to liberalize the FAME scheme to accommodate fleet segments (i.e., private e-buses and corporate e-cars) relevant to employee transport, where there is significant market traction.

Photo credits: Lithium

E1. Include privately operated e-buses within the ambit of the FAME II scheme

ELIMINATING SUBSIDY ALLOCATION ANOMALIES ACROSS VEHICLE SEGMENTS

Context

In the FAME II scheme, a budget of INR 35.45 billion (USD $490 million) has been allocated for e-buses – only buses used for public transport are covered. The DHI had invited EoIs from cities to submit a proposal for deployment of e-buses under Gross Cost Contract (GCC) models. A total of ~7,100 e-buses were subject to the scheme. But there are no provisions for private bus operators to avail subsidies.

While commercial operations of other EV segments (i.e., e-2Ws, e-3Ws or e-cars) are subsidized under FAME II, e-buses are excluded. This appears to be an anomaly, given that e-buses are largely aligned to the vision of clean and shared mobility.

Rationale

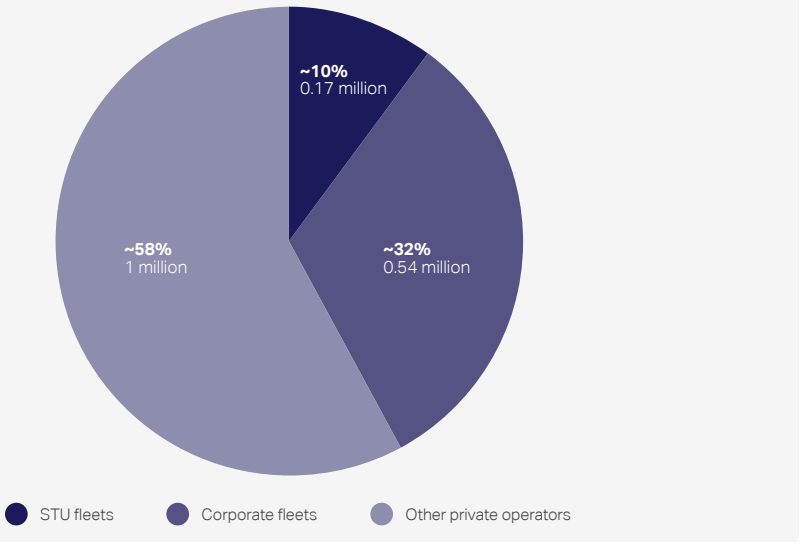
Of the total 1.7 million buses in India,[39] only 10% are owned by state transport undertakings (STUs). Providing subsidies to only STU-run buses limits the early transition opportunity for private players running buses with higher utilization (180–200+ km/day) for use cases such as employee transport, school buses and airport transfers.

Many companies, such as Shuttl[40] and Lithium[41], have already expressed interest and are adopting EV buses for the employee transport segment. Similarly, there is latent demand from forward-looking corporate customers who are encouraging their fleet partners to consider e-buses. In 2019, we supported Shell India to evaluate the use of e-buses for employee transport at the Bangalore Technology Center.

Adoption of EVs by private bus fleets in such high-utilization cases would also be beneficial from an emissions standpoint: buses emit close to 0.92 kg of CO_2 per km, against 0.12 kg per km, 0.2 kg per km and 0.35 kg per km, for 3Ws, cars and SCVs respectively.[42]

Extending subsidies to privately operated e-buses is in line with the FAME II standpoint of being supportive to high-utilization and high-impact (emissions) vehicle segments.

Figure 7: Bus market in India – total stock (million)[39]



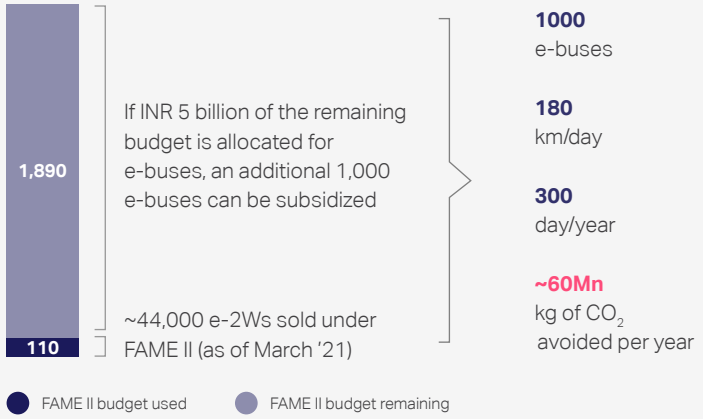
Recommendation(s)

The DHI should support the inclusion of privately operated e-buses under the ambit of the FAME scheme:

- The DHI can consider facilitating cabinet approvals and amendments to the FAME scheme, reappropriating a portion of the INR 20 billion (USD $276 million) fund allocated for 2Ws (which is unutilized) for privately operated e-buses.
- A subsidy mechanism for private bus operators could be introduced with a reduced quantum of subsidy per bus – targeting more buses with the same subsidy outlay.
- For transparency, public procurement tenders can form the basis of a private e-bus subsidy OR the state governments can issue tender-based rate contracts for private e-bus sales.

Re-appropriating INR 5 billion (USD $70 million) from the 2W funds would mean an additional funding for 1,000 e-buses – assuming a subsidy quantum of INR 20,000 (USD $276) per kWh; this additional coverage could serve the short-term demand coming from private e-bus operators, airlines and airports and others.

Figure 8: Examining FAME II budget allocation for e-2Ws



E2. Extend FAME subsidies to institutional and corporate buyers for e-cars

SUPPORTING ELECTRIFICATION OF A RISING SEGMENT OF CORPORATE VEHICLES AND FLEETS

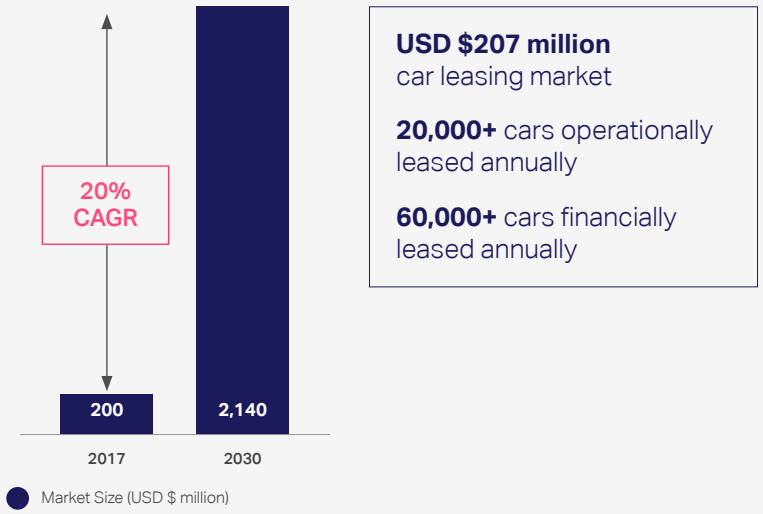
Context

Companies provide cars to their employees under a variety of schemes:

- The company buys and leases the car to the employee. The car belongs to the employee on completion of the lease period.
- The company provides a car as an in-kind benefit to middle and senior executives.
- The company provides a car as part of the cost to company (CTC) for the employee.

Presently, these corporate electric four-wheelers cannot claim subsidies under the FAME II scheme because the subsidies for e-4Ws are limited to high-utilization use cases such as taxis. Thus, this recommendation is the only exception in this report that is divergent to the guiding principle of high-utilization use cases assumed initially in the report. This exception is assumed because of the potential scale of the market. The Indian car leasing market is today worth USD $207 million and is poised to grow at CAGR 15–20% between 2020–30.

Figure 9: India car leasing market (2017–2030)



Rationale

Corporates increasingly offer leased vehicles to their employees. Corporate leasing has been a big driver for vehicle sales globally and is catching up in India as well. With an increasing number of businesses committed to acting on climate, this market segment can be leveraged to promote sales of electric mobility.

Corporate EV leasing could benefit both employers and employees because of the following reasons:

- A vehicle used solely for official purposes by the employee attracts no tax liability; any deduction from salary on account of lease rental is a tax-deductible benefit.
- Corporates can design tax-efficient salary structures for employees.
- Corporates can use this as an employee-retention benefit.
- Employees need to make zero down payment (this is otherwise usually 20–30% of the on-road price).

Recommendation(s)

Evaluate extension of FAME subsidies to institutional/corporate buyers (including for financial leasing to employees)

The DHI can consider facilitating cabinet amendments to the FAME scheme to include cars procured by corporates and leasing companies for a time-bound period. The subsidy from the FAME scheme would enable leasing companies and corporates to offer EVs for lease at lower and more favorable rates.

Photo credits: eee-taxi

4b Use case-specific policy recommendations – ride-hailing

Photo credits: BluSmart

4b Use case-specific policy recommendations – ride-hailing

Ride-hailing is evolving as a preferred form of commute in Indian cities. India's shared vehicle market has undergone significant structural changes in recent years and the advent of ride-hailing services has been one of the major mobility transitions. The emergence of innovative, app-based ride-hailing services across vehicle segments has extended on-demand transport options for consumers beyond the traditional/offline taxi industry.

The overall size of the Indian taxi market is approximately USD $10 billion and is expected to reach USD $60 billion by 2030. While the current COVID-19 pandemic may delay achievement of turnover targets, medium- to long-term growth of ride-hailing in India is likely. The app-based ride-hailing transition in India has been primarily led by companies like Ola and Uber. Both companies have deployed over USD $2 billion in the Indian market and have created an inventory of over 0.7 million cabs, catering to 3 million trips per day.[44]

However, this growth in the ride-hailing market, primarily powered by petrol and diesel in India, also has huge implications for India's energy use, carbon emissions and air quality. Ride-hailing also represents a relatively high percentage of urban vehicles in most major Indian cities, and their high mileage makes them large contributors to problems of climate change and air quality in cities. Ride-hailing cars, representing 1.2% of the total car stock in India (as of 2019), contribute 6% of the total emissions caused by cars in India.[45] With such high-utilization rates and scope for expansion, ride-hailing becomes an ideal use case for EVs.

Electrification of ride-hailing is aligned to the government's vision of clean and shared mobility and already enjoys policy and regulatory support. However, uncertainties prevail for the growth of e-bike taxis and rentals in India across states, and could be addressed through regulatory interventions. There are policy opportunities that can also enhance ride-hailing driver incomes, thus driving adoption. This section highlights needs and measures to legalize e-bike taxis and streamline licensing of e-bike rentals across all states and to use fiscal measures to nudge individual drivers to switch to electric.

Photo credits: SmartE

R1. Legalize e-bike taxis and streamline licensing of e-bike rentals across states

USING 2W LEADERSHIP AND ECONOMIC VIABILITY TO ACCELERATE CLEAN AND SHARED MOBILITY

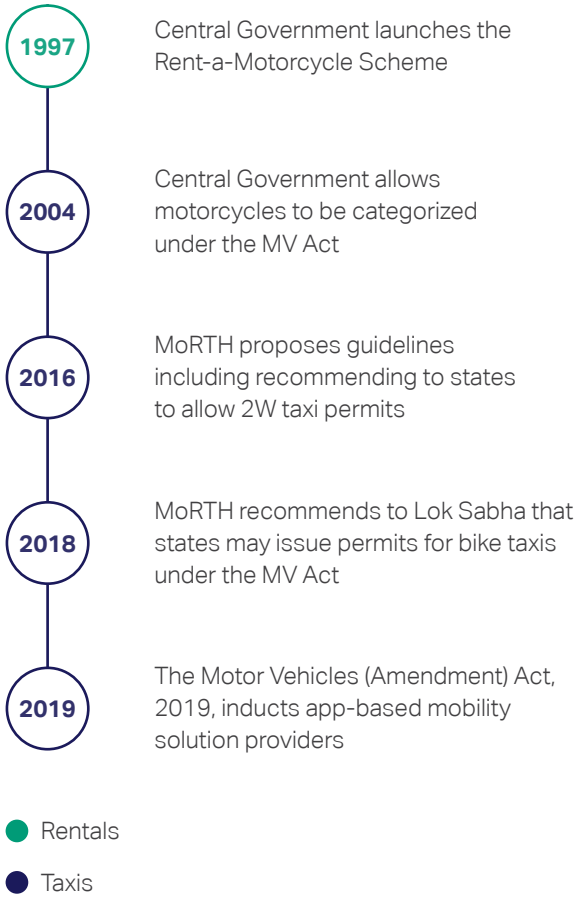
Context

India is a 2W-dominant market. The uncertain and differing regulatory approaches at the state level have constrained the growth of India's market for bike taxis and rentals. **The high utilization of taxi and rental services plays to the economic advantages of EVs and has the potential to create organic and large-scale uptake of e-2Ws.**

The year 2018 saw many state departments in Haryana, Telangana, Gujarat and Uttar Pradesh issue bike taxi permits. Close to 14 states have now legalized bike taxis.[46] Despite such regulatory updates, many states, such as Madhya Pradesh and Karnataka, have explicitly banned bike taxis, citing safety reasons.[47]

Parallelly, while bike rentals were made legal through the Rent-a-Motorcycle Scheme since 1997, a few states have not developed or adopted guidelines to facilitate such models. App-based fleets are facing delays in license issuance by states – which may take over nine months, as the process is not streamlined. Additionally, a few states are not issuing licenses, given how they do not have guidelines in place.[48]

Figure 10: Evolution of policy and regulations governing bike taxis and rentals



Rationale

The demand-responsiveness and affordable nature of bike taxis make them the ideal mode to increase the reach of public transit. A 2018 NITI Aayog report[49] proposed expanding the definition of shared mobility to include bike sharing and acknowledged it as a great low-cost option for first- and last-mile connectivity.

Despite regulatory hindrances, numerous promising companies have deployed electric bike taxis and bike rentals, such as Ola Bike, Bounce and eBikeGo, corroborating the business viability argument for EVs and demonstrating the potential for this market. In 2019, Ola bikes alone recorded 166 million km and their top bike partners traveled 38,289 km. Bounce reported more than 90 million km in 2019. **Legalization of e-bike taxis and stre\amlining licensing of e-bike rentals through an easier and more efficient regulatory landscape would likely spur fund utilization for 2Ws under the FAME II scheme, which has otherwise been low.**

Photo credits: Bounce

Recommendation(s)

BIKE TAXIS

The MoRTH should enforce legalization of e-bike taxis across all states in pursuit of implementing the 2019 amendment to the Motor Vehicle (MV) Act 1988:

- Electric bike-taxis should be legalized across all states.
- Licensing and permit processes should be eased – application requests must be addressed within one month for drivers.
- The cost of bike taxi licensing is comparable to cars. In some states, it is as high as 25% of 2W cost. This could be re-examined and lowered for electric bike taxis.

State governments through their regional transport offices (RTOs) could issue consistent, supportive policies enabling commercial application of electric bikes used for rental, taxi and pooling options.

City authorities and planners should synthesize e-bike taxi operations at the city planning stage to improve links with public transit:

- This can be done by providing designated pick and drop spots at public transit stations; parking and charging spaces for bike taxi services; and digital integration with public transit for ticketing and payment purposes.

BIKE RENTALS

The MoRTH should ensure that all states and union territories have guidelines in place for bike rentals to streamline licensing requests in a time-based manner:

- All states and union territories should have guidelines in place for issuing licenses for bike rentals.
- Licenses to bike rental businesses for operations should be issued within a stipulated time of one month from the day of application, without restriction on the number of vehicles.
- Digitization of the whole licensing process could be encouraged at the state and city levels.

R2. Waive toll fees and airport charges for EV taxis

INCENTIVIZING INDIVIDUAL DRIVERS AND FLEETS TO SWITCH TO ELECTRIC TAXIS

Context

Presently, only six states, including Karnataka, Maharashtra and Tamil Nadu have waived road tax on EVs. Other states are yet to provide such benefits for EVs. The draft toll policy prepared by the National Highways Authority of India (NHAI) proposes a 50% concession in toll fees for EVs.[50]

Rationale

We estimate that toll fees and airport charges equate to 15% to 20% of a taxi driver's income, assuming a monthly income of INR 20,000 (i.e., USD $276, excluding fuel costs) and having to spend INR 3,000 to INR 4,000 (USD $40 to $55) on toll fees and airport charges. E-taxi drivers find it increasingly difficult to afford EVs due to their high upfront costs. Waiving toll fees and airport charges reduces their operating cost and awards them for their early adoption. They also encourage ICE taxi drivers to switch to EVs.

Recommendation(s)

Waive government-administered toll fees, airport entry charges and parking charges for EV taxi drivers.

Photo credits: BluSmart

4c Use case-specific policy recommendations – deliveries

Photo credits: IKEA India

4c Use case-specific policy recommendations – deliveries

India is ordering more goods online now than ever before — and demanding that those goods arrive at a lightning pace. This trend has only accelerated because of COVID-19. The past decade has seen unparalleled growth in last-mile deliveries, primarily across new markets such as urban e-commerce, food/grocery deliveries and couriers. Last-mile freight and deliveries have been a key enabler in the growth of the digital retail market.

The growing shipments of goods to consumers' doorsteps have a negative impact on cities – an increasing quantum of carbon emissions, local vehicular and noise pollution and traffic congestion. In the business-as-usual scenario, the carbon footprint and the congestion caused by urban logistics globally is expected to grow continually and increase by 36% and 21% respectively, until 2030.[51]

In 2020, the World Economic Forum (WEF), together with WBCSD and McKinsey & Company, developed 24 supply chain and technology interventions that last-mile logistics companies should adopt to solve delivery challenges and lower emissions without affecting profit.[52] Among these, accelerated adoption of EVs is one of the prioritized interventions that offers the highest potential impact towards abatement of urban emissions and air pollution.

The surge in demand, accompanied by increased vehicle utilization (and rising fuel prices), presents an economically beneficial opportunity for delivery companies contemplating a transition to electric mobility.

Many companies in India are already acting on this transition and are known to have deployed light EV pilots for their delivery requirements across major Indian cities. In 2020, Flipkart became the first e-commerce marketplace in India to commit to transitioning 100% of their vehicle fleets to electric by 2030, by joining the EV100 global initiative. They are primarily assisted by service providers such as e-Kart, Delhivery, GATI and others to transition their ICE fleets to more cost- and environmentally-effective EV variants.

However, there are challenges related to EV adoption in this use case, such as a lack of EV options for heavier delivery vehicles; permit concerns related to cross-sector usage of the same vehicle; and concerns related to the licensing regime of 2Ws vehicles, and these challenges require policy and regulatory interventions. This section highlights recommendations that could catalyze EV adoption in this last-mile urban freight and deliveries use case, such as experimental daytime entry of heavier electric delivery vehicles in cities for a timebound period to drive early adoption; allocation of FAME funds to subsidize certified retrofitting kits for heavier electric delivery vehicles; establishing favorable regulations for cross-industry usage of e-2Ws; and establishing a robust licensing structure to foster e-2W development and sales.

D1. Experiment with daytime entry of electric SCVs and MCVs into cities for a timebound period

USING DAYTIME ENTRY RELAXATION AS A LEVER TO DRIVE EV ADOPTION FOR DELIVERIES

Context

Cities such as Delhi instate daytime entry rules for heavier vehicle segments, with the primary objective of managing traffic congestion during peak hours. Usually, heavy-duty freight vehicles are allowed into the city only during off-peak hours (11 pm–6 am). These entry timings are subject to change on a day-to-day basis for reasons such as festivals, construction projects, changing traffic peaks and more.[53] However, city authorities often relax such measures according to their requirement and need. For example, Delhi exempts commercial vehicles carrying water, oxygen cylinders, medicines, medical waste and fuel (kerosene, diesel, CNG, petrol and LPG) from taking permission for day-time entry.

From a fleet operator's perspective, daytime operations bring in operational efficiency. Extending a similar timebound relaxation to heavier commercial EVs for daytime entry into cities could be used as a key lever to drive EV adoption among these companies. The local governments could consider experimenting with regulatory alterations.

While the recommendation acknowledges that EVs may not tackle the primary focus of road congestion (categorizing form factors) and may instead inflate it, entry relaxation experiments through time-bound pilots in key city pockets and along select highways could be used to gauge effectiveness and plan measures for future implementation.

Rationale

Day-time entry incentives could offer the following to concerned stakeholders:

- **Delivery fleets:** Daytime entry will reduce the turn-around time for delivery fleets, which is a key performance indicator, encouraging them to switch to electric variants.
- **Government authorities:** Daytime entry rules offer the government an instrument with greater flexibility than more firmer measures such as LEZs.
- **Auto OEMs and fleet operators:** Since not a lot of EV options are available in segments governed by daytime entry rules, added incentives could offer clear demand signals to OEMs to develop such vehicles and to fleet owners to pilot them.

Recommendation(s)

City authorities should consider relaxing city daytime entry restrictions for heavier commercial EVs for a timebound (short-term) period:

- The regulatory measure could initially focus on specific segments such as SCVs and MCVs in delivery and logistics fleets.
- Pilots could be hosted in key city pockets and routes.
- The regulatory measure could be short-term (2-4 years)

D2. Allocate FAME funds to subsidize certified retrofitting kits for electric SCVs and MCVs for a timebound period

ADDRESSING THE BARRIER OF MODEL AVAILABILITY AND ACQUISITION COST FOR DELIVERIES

Context

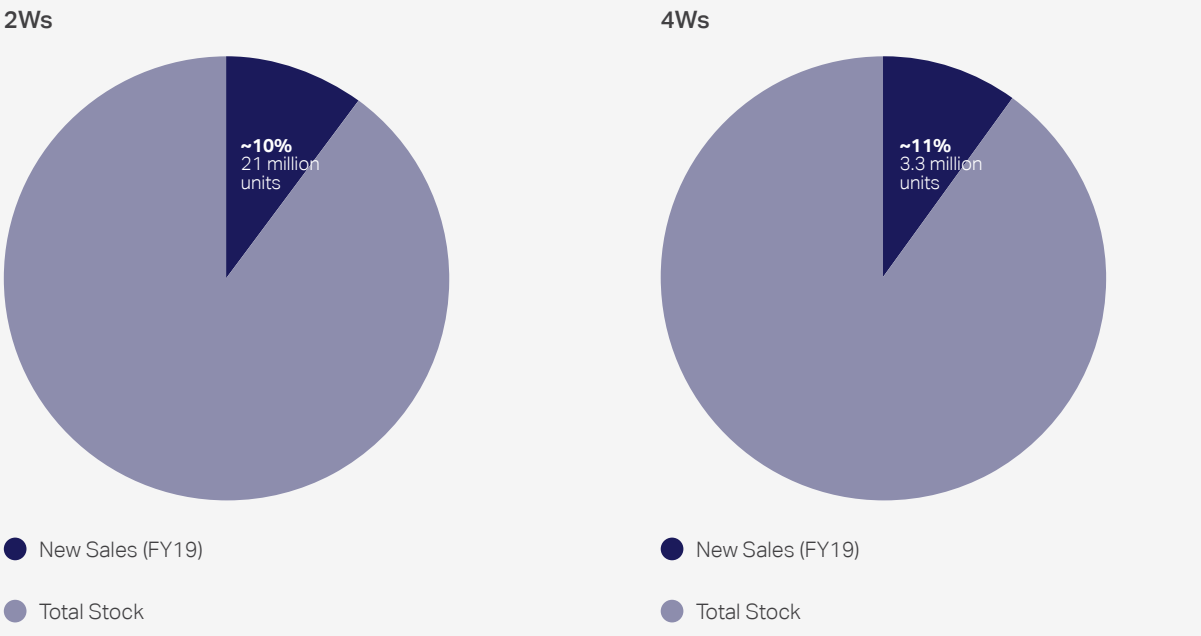
EV retrofitting to convert ICE vehicles to EVs has increasingly been seen as a short-term solution to the lack of EV options in certain vehicle segments. Presently, for 4Ws and SCVs, the E-Trio electric kit is priced between INR 0.35-0.50 million (USD $4,800-$6,900), while 3W kits range between INR 0.05-0.10 million (USD $700-$1,400). Batteries account for most of this cost.[54] Presently, retrofitting ICE vehicles into EVs is one of the more widely used methods of electrifying commercial fleets. However, retrofitting kits are not recognized or incentivized under FAME.

Rationale

- **Electrifying current vehicle stock:** In India, annual 2W sales in FY19 were 21 million units (~10% of national 2W stock); and annual 4W sales in FY19 were 3.3 million units (~11% of national 4W stock of 30 million cars). The current FAME scheme is targeting only new sales in the 2W, 3W, and 4W categories, i.e., less than or equal to 10%[56] of the market.

In addition to this, nearly 10% of all 4Ws are vehicles used for commercial purposes, such as taxis and cabs. Electrifying 4Ws and 2Ws serving commercial purposes in use cases such as deliveries and ride-hailing already makes good economic sense for drivers, even with newly fabricated EVs. Retrofitting kits would hence target the other 90% of the market and enable conversion of easier segments (cabs, taxis) to electric today.

Figure 11: Annual new sales vs vehicle stock of 2Ws and 4Ws[55]



- **Increasing EV options:** In delivery use cases, vehicle segments such as 2W, 3W and SCV are heavily employed. Viable electric variants for such vehicle segments may not be available in the short term. In the 3W (goods carrier) segment (payloads between 0.35–0.5 tons), Piaggio, Bajaj Auto, Mahindra & Mahindra, Atul Auto and Scooter India are leading players, each with 2–3 popular models. Similarly, in the SCVs segment (payloads between 0.5–2 tons), many popular vehicle options from Mahindra, Tata Motors and Ashok Leyland exist. The SCV market sees an annual new vehicle sale of 500,000 vehicles. Both 3Ws and SCVs, however, have few or no electric options in the market. Competing in the 3W goods carrier segment are only 3–4 EV options from Gayam Motors, Kinetic Green and a few other local OEMs.[57]
- **Foster circularity in vehicles:** Extending vehicle life through retrofitting increases the full life-cycle value of vehicles and contributes significantly to reducing manufacturing environmental footprints.

Encouraging uptake of retrofitting kits in the 2W, 3W and SCV vehicle segments could hence offer benefits in four broad ways:

- Boosting electrification of current vehicle stock for 2Ws, 3Ws and SCVs
- Boosting the number of EV models available for 2Ws and 3Ws
- Rolling out EV options for SCVs and MCVs in the short term
- Providing an additional demand for charging infrastructure, fostering the development of the ecosystem

Recommendation(s)

The DHI could facilitate cabinet amendments to the FAME II scheme to include certified retrofitting kits for heavier delivery vehicles (SCVs, MCVs and HCVs).

The DHI could allocate funds to subsidize retrofitting kits for SCVs under FAME. It can assume the same INR 10,000 (USD $138) per kWh value for subsidies, which can be granted to retrofitting companies developing the kits. similar to OEMs for newly-fabricated EVs.

The MoF should institute fiscal measures and incentives for certified retrofitting kits for heavier delivery vehicles (SCVs, MCVs and HCVs). These include reducing the GST charged on retrofitting services from 18% to 5%, bringing it on par with GST on new EV sales.

MoRTH should waive registration charges on retrofitted EVs, the same as new EVs, to encourage more consumers to use retrofitting kits.

D3. Enable permit flexibility for usage of e-2Ws across use cases

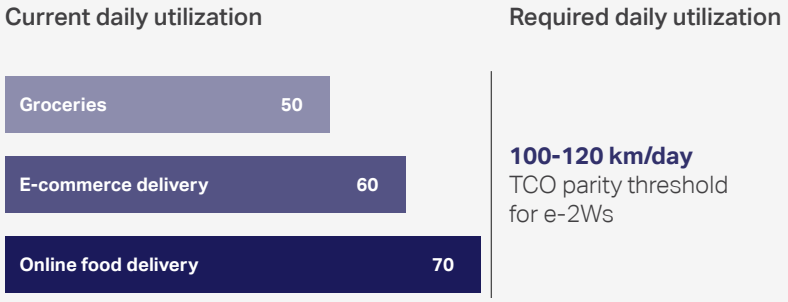
ESTABLISHING FAVORABLE REGULATORY INFRASTRUCTURE FOR CROSS-INDUSTRY USE

Context

This recommendation is applicable to both the ride-hailing and the deliveries use cases.

Presently, permits are issued to vehicles for a singular purpose. If the owner of a personal 2W wants to operate it as a bike taxi, then he/she requires a separate permit for this purpose. Obtaining these permits is often a time-consuming and complicated process.

Figure 12: Current daily and required daily utilization (in km/day) for e-2Ws to achieve TCO parity with ICE 2Ws



Rationale

Owing to the high upfront price disparity between EVs and their ICE counterparts, users must run their vehicles at high-utilization rates to benefit from EVs' low operational costs. This may not be the case if commercial 2Ws are made to run only on one dedicated platform.

For a variety of reasons, such as the nature of duty-cycle curves and demand–supply restrictions, drivers may not be able to achieve parity thresholds in the use cases. Instead, as private contractors, they could switch between platforms to maintain utilization thresholds (for example, a 2W can deliver e-commerce goods in the afternoon and deliver food in the morning and evening to boost vehicle utilization).

Recommendation(s)

Allowing permit flexibility for usage of e-2Ws across use cases:

Allowing cross-industry use of e-2Ws across people and goods movement would count as preferential treatment to EVs and would encourage people to own EVs. This would allow EV owners to earn dual revenue from passenger and deliveries transport using the same vehicle, simultaneously achieving higher utilization.

D4. Consult and revise regulations for e-2W related to motor power ratings and OEM licensing structure

ESTABLISHING A ROBUST LICENSING STRUCTURE TO FOSTER E-2W DEVELOPMENT AND SALES

Context

This recommendation is applicable to both the ride-hailing and the deliveries use cases.

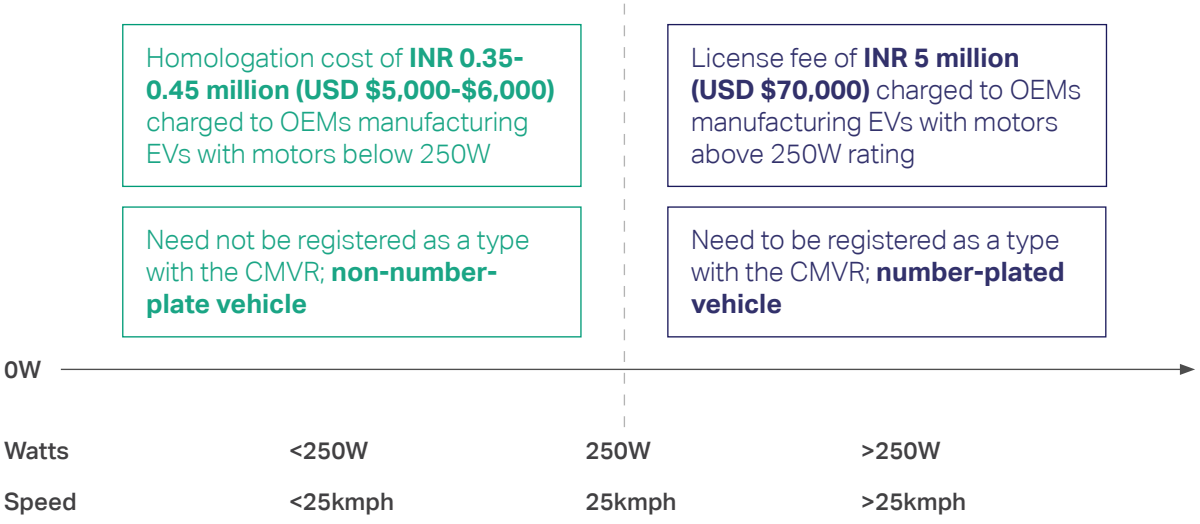
In the current scenario, regulations set by the Central Motor Vehicles Rules (CMVR), 1989 lays down that OEMs that manufacture/assemble e-2Ws with motor ratings below 250W and a speed limit of 25 kmph will be subject to a homologation cost of INR 0.35-0.45 million (USD $5,000-$6,000),[58] while OEMs that manufacture e-2Ws with motor ratings above 250W and speed limits above 25 kmph must register them with CMVR and incur a licensing cost of INR 5 million (USD $0.07 million)[59] (i.e., approximately 10 times).

Based on industry consultations, the regulatory threshold put forth by the Automotive Research Association of India (ARAI) and other participating regulatory bodies, of 250W for electric 2Ws, has been inspired by norms established in Europe and the United States for electric bicycles; in particular, the EN 15194:2017 European standard[60] for electric bicycles with pedal assistance up to a maximum of 25 kmph and a maximum continuous motor output of 250W, which was harmonized under the Machinery Directive. It is to be noted, that e-bicycles in these countries are predominantly confined to pedestrian pathways and cycling routes developed around cities, and not on roads where bikes, cars and buses would ply.

Such a regulation based on European standards might not fully suit Indian conditions, especially where all vehicles share the main roads and there is no separate infrastructure for pedestrians and (e-)bicycles.

Per industry experts, today, 70–80% of the e-2Ws running on roads are circumventing the ARAI-CMVR by getting their vehicles approved as non-number plate vehicles to avoid the high licensing fees (INR 5 million, i.e., USD $0.07 million). These vehicles are later modified with increased motor wattage and speed depending on operations (deliveries, ride-hailing).

Figure 13: Regulatory landscape for OEMs based on EV motor power ratings and maximum speed



Rationale

The rationale for this recommendation stems from the legacy regulatory landscape in the Indian EV market. The following events were observed:

Challenge	Impact on OEMs and users
Number-plated e-2Ws get priced higher	• Manufacturers developing products with motor ratings higher than 250W bear the INR 5 million (USD $0.07 million) licensing cost. • Number-plated vehicles are automatically priced higher than their unregistered counterparts, which usually perform at par (given that the specifications of battery size and motor rating are almost comparable).
Local and new manufacturers bypass regulations	• Considering the licensing regulations for EVs with motors below and above 250W and 25 kmph, many budding local OEMs elect to circumvent the regulation and register their vehicles in the below-250W–25kmph category to avoid paying high licensing costs. Consequently, they deploy the same vehicles with motors well beyond 250W ratings (up to 2 kW in some cases). This allows them to undercut their more established competitors who are adhering to the regulations and paying hefty licensing fees.
Vehicle quality and user safety are compromised	• Manufacturers operating in the below 250W–25 kmph category tend to pair the same battery (for example a 700–800Wh battery meant to be paired with a 250–500W motor) with high-rated motors such as 1–2kW. This results in an increased strain on the battery and a subsequent reduction in battery life (within as little as six months). The same manufacturers then fail to provide customers with replacements. This has resulted in vehicle performance and quality concerns for customers. • As per industry experts, this same phenomenon has also led to incidents where excessive strain on batteries from motors in e-bikes has led to the battery catching fire, seriously putting the rider in danger. This would also have serious implications on the consumer psyche and confidence in EV technology, and thus the future of e-2W adoption in India.

Recommendation(s)

ARAI should consult with the industry and revise the technical regulations related to licensing fees based on motor power ratings in electric 2Ws:

The government should explore dialogues and wider consultation with leading members and industry associations such as the Society of Manufacturers of Electric Vehicles (SMEV) on the following suggested measures:

- Revise licensing regime for OEMs based on motor power ratings of EVs manufactured.
- Revise ARAI and CMVR regulation on motor power ratings and speed limits to legitimize manufacturers circumventing the current regulation; a short- to medium-term measure could be moving the 250W threshold to 500W.
- Reduce the licensing cost differential for OEMs manufacturing e-2Ws below or above 250W. Challenges in this system have come to light in a recent High Court case in Karnataka.[61]

Evaluation of prioritized recommendations

Based on inputs from companies, WBCSD qualitatively evaluated all the recommendations in the report (except for foundational sector-wide recommendations) to assess priority. The foundational recommendations were considered independent of the other policy asks and were not evaluated. Company experts were asked to classify policy recommendations on a scale of high, medium and low, individually and relatively, on three metrics. These metrics are: (a) **possible impact of policy recommendation** on investments and market creation; (b) **cost of policy recommendation** from an implementation perspective; and (c) the **ease of implementation of policy recommendation**, considering the mechanism proposed. The high, medium and low scales were then assigned weights. The following chart represents the consensus-based evaluation of recommendations.

Figure 14: Relative evaluation of recommendations based on ease of implementation (y-axis); impact on EV investment and market creation (x-axis); and cost of implementation ($)

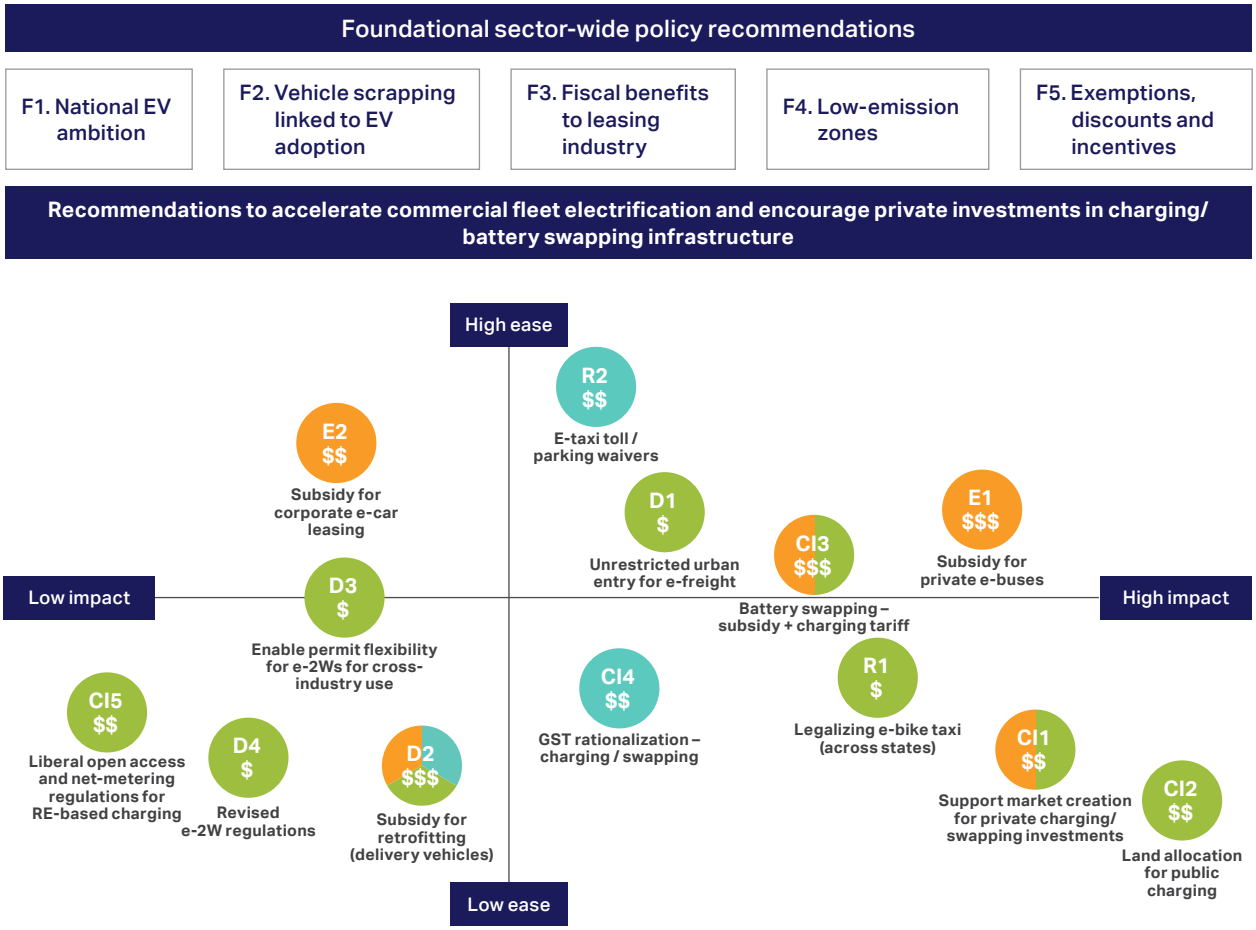


CHART LEGEND

- FAME-related recommendations
- Non-FAME fiscal measures
- Regulatory provisions

- D Deliveries
- R Ride-hailing
- E Employee Transport
- CI Charging

COST INDICATOR

- $$$ High cost
- $$ Medium cost
- $ Low cost

Conclusion: Guiding pathways for policy action on commercial fleet electrification

1. ADOPT AN AMBITIOUS NATIONAL EV TARGET TO TRIGGER DEMAND – STATUS QUO IS NOT AN OPTION

A strong ambition for electrification will set a clear direction and create long term visibility, triggering demand so that every participant in the value chain can engage in joined up planning and investment. A national EV ambition, either in the shape of an EV sales target or an ICE phase out target, along with a clear timeline and roadmap for implementation can provide certainty and galvanize action across policy and market.

2. TRANSITION COMMERCIAL FLEETS FIRST

Prioritizing the commercial fleet segment will secure the biggest and fastest impact , owing to high vehicle utilization and resulting economic viability. Capturing these low hanging opportunities immediately through policy interventions can both catalyze high impact EV uptake and pave the way forward for scaled manufacturing in the coming years. Learnings from commercial fleets and the value they deliver are transferable to other segments in transition. In the Indian context, prioritized use cases for commercial fleets include employee transport, ride-hailing and urban freight/deliveries.

3. LIBERALIZE FAME SUBSIDY SCHEME

Two thirds of the intended FAME II scheme duration have elapsed (as of Apr 2021) While there is more traction on buses and charging, only 4% of the incentives allocated for light vehicles (2Ws and 3Ws) and cars have been utilized[7] This highlights the need to adapt the structure and duration of fund allocation. There is merit in: (a) expanding the scope of the FAME subsidy scheme to more fleet segments (private e-buses, corporate e-cars), fueling technologies (battery swapping) and business models (certified retrofitting), where there is significant market traction, and (b) continuation of the scheme beyond Mar 2022.

4. HARMONIZE POLICIES ACROSS GOVERNMENT MINISTRIES AND DEPARTMENTS

India's electrification agenda involves many diverse stakeholders, ministries and interdependent parts in the economy. To realize the full potential of electric mobility transformation, a systems approach within ministries can best address and exploit these diverse perspectives. Future policies in relevant economic sectors (mobility, real estate and energy) should: (a) factor in transversal pathways to propel EVs (e.g. national logistics policy, vehicle scrappage policy, model building by-laws and national RE policy) and (b) be aligned to the vehicle electrification ambition.

5. OFFER NON-FINANCIAL INCENTIVES TO EVs – CREATE IMPACT WITHOUT SPENDING FROM PUBLIC EXCHEQUER

Complementing central- and state-level fiscal incentives (such as exemptions/discounts on registration, tolls, parking etc.) with enhanced non-fiscal incentives such as instituting LEZs; relaxing daytime entry restrictions for urban freight EVs; legalizing e-bike taxis and streamlining the licensing of e-bike rentals across states; and providing exemptions/discounts can encourage and accelerate adoption without the need for dipping into the public exchequer. All such opportunities should be explored.

6. ESTABLISH MARKET RULES – ENHANCE EASE AND ACCESSIBILITY OF REGULATIONS

Instituting clear, unbiased market rules and guidelines for all stakeholders can ease regulatory barriers. For example, socializing grid upgradation cost and setting out responsibilities for the payment of the cost; defining associated maximum timelines; earmarking and supporting acquisition of optimal real estate for charge point operators; and establishing favorable regulations for cross-industry utilization of 2W vehicles.

7. ENABLE ACCESS TO CLEAN ENERGY TO POWER CLEAN MOBILITY

India's ambitious RE targets are appreciated across the world. EV charging demand is currently scattered and disaggregated. Liberal regulations to aggregate demand for charging stations to allow usage of RE through open access or lowering the open access threshold for charging operations would allow India to power its energy transition for mobility using RE.

8. ENSURE A LEVEL PLAYING FIELD WHILE FORMULATING POLICIES

Extensive participation from various stakeholders will be required to create impact at scale. Distortions such as preferential treatment to the public sector vis-à-vis the private sector to set up public charging infrastructure and related allocation of land; absence of subsidies for battery swapping technology; and absence of fiscal benefits for EV leasing compared to EV buying should be eliminated.

Partners for this report

WE MEAN BUSINESS

We Mean Business is a global non-profit coalition working with the world's most influential businesses to take action on climate change. Together we catalyse business leadership to drive policy ambition and accelerate the transition to a low-carbon economy. Our mission is to ensure that the world economy is on track to avoid dangerous climate change by 2020 while delivering sustainable growth and prosperity for all.

WILLIAM AND FLORA HEWLETT FOUNDATION

The William and Flora Hewlett Foundation is a nonpartisan, private charitable foundation that advances ideas and supports institutions to promote a better world. The Hewlett Foundation has been investing for a number of years in various strategies to avoid the worst effects of climate change and spare human suffering by reducing greenhouse gas (GHG) emissions. Our grants focus on cleaning up power production, using less oil, using energy more efficiently, preserving forests, addressing non-CO_2 greenhouse gases, and financing climate-friendly investments. Our grant making is focused on developed countries with high energy demand and developing countries with fast-growing energy demand.

THE CLIMATE GROUP – PROJECT PARTNER

The Climate Group drives climate action. Fast. Our goal is a world of net zero carbon emissions by 2050, with greater prosperity for all. We focus on systems with the highest emissions and where our networks have the greatest opportunity to drive change. We do this by building large and influential networks and holding organisations accountable, turning their commitments into action. We share what we achieve together to show more organisations what they could do. We are an international non-profit organisation, founded in 2004, with offices in London, New Delhi and New York.

EY INDIA – TECHNICAL PARTNER

EY is a 'Big 4' management consulting firm and a leading advisor to the power & utilities sector, and the upcoming e-mobility sector. EY works with senior management at federal and private sector firms, including 9 out of the top 10 Fortune Global 500 utilities. In India, EY has extensively worked in and shaped the e-mobility sector. As part of marquee engagements, EY India has worked with leading auto-OEMs, power- and transport-utilities, Government entities such as NITI Aayog, MoP, BEE, MNRE, and promising think-tanks, start-up and contemporary charging infrastructure companies, battery manufacturers, and more.

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The incentive utilization percentage for light electric vehicles (2W and 3W) and e-cars is 4% and is calculated in proportion to the total vehicles sold as of the mentioned date, i.e., 2W – 52,386, 3W – 13,778, cars – 1,522.

Of the total allocation for e-buses, supply orders for 38% were achieved. Of the total allocation for charging infrastructure, letters of approval (LoAs) for 66% were issued. The source for these two figures is an announcement made by the DHI at the launch of the Go Electric Campaign on Feb 19, 2021.

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Vehicle technology: The industry is witnessing significant advancements in alternate technologies such as fuel cell-based/hydrogen-based heavy trucks. In view of the nascent stage of the technology, this report makes no recommendations on the technology choices for future policies.

Heavy-duty freight vehicles: There is limited availability of medium- and heavy-duty freight vehicle models globally as well as in India. This report tackles urban deliveries and electrification of light/medium-duty freight but does not make any recommendations to electrify medium- and heavy-duty freight. WBCSD plans to work further on the "India Guide to Electric Freight Adoption", where this topic will be dealt with in greater detail.

Public transport and personal transport: We acknowledge that the utilization levels of public transport and the scale of personal transport are prime use cases for EV adoption. This is acknowledged under current Indian policy framework and this paper does not provide any recommendations beyond the use cases selected above, therefore excluding public transport buses.

Manufacturing and supply-side initiatives: Encouraging manufacturing under the Make in India campaign and supporting the supply chain stakeholders is an indispensable part of EV transition. This report does not examine the various manufacturing-related incentives and makes no recommendations for their improvement.

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Assumptions: Poland's 2019 grid energy mix – 70% coal, 15% RES; Sweden's 2017 grid energy mix – 27% coal, natural gas, rest nuclear/RES. It is also assumed that the battery & EV manufacturing has taken place in a country with a similar grid mix for both Poland & Sweden.

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Associated business-focused initiatives in India

EV100

EV100 is a global initiative led by The Climate Group bringing together forward-looking companies committed to accelerating the transition to EVs and making electric transport the new normal by 2030. The Climate Group harnesses the collective purchasing power of EV100 members to build demand for EVs and send a clear signal to the market. Electric transport offers a major solution in cutting millions of tons of greenhouse gas emissions per year, as well as curbing transport-related air and noise pollution.

Urban Mobility Lab Initiative

Rocky Mountain Institute India accelerates India's transition to a clean, accessible, and prosperous energy future. It engages government, industry, and civil-society leaders to design innovative policy frameworks and market solutions to support India's clean energy and mobility transformations. At the national level, RMI collaborates with NITI Aayog and Ministries to help establish a vision for the future of EVs and energy storage in India. At the subnational level, RMI India collaborates with state governments, urban local bodies, and the private sector through its Urban Mobility Lab initiative to deploy pilot projects that realize environmental impacts and build confidence towards further action.

Electric Mobility Initiative (EMI)

Electric Mobility Initiative (EMI) is a multi-funder platform mobilizing philanthropic efforts supporting the accelerated adoption of electric mobility in India. The initiative brings together like-minded organizations under a common strategy to drive forward electric mobility policy design and implementation. EMI collaborates with stakeholders across the spectrum including government, regulators and industry, through our grantees and partners who share our vision for a clean and secure energy future for India. EMI is hosted by Shakti Sustainable Energy Foundation.

CEEW – Centre for Energy Finance

The Council on Energy, Environment and Water (CEEW) is one of Asia's leading not-for-profit policy research institutions. The Council uses data, integrated analysis, and strategic outreach to explain — and change — the use, reuse, and misuse of resources. The Council addresses pressing global challenges through an integrated and internationally focused approach. CEEW's Centre for Energy Finance is actively working on electric mobility, and has two key projects underway – EV charging interoperability (in partnership with eDRV) and an Electric Mobility dashboard. These projects aim to support the mobility transition by increasing transparency and building consensus among different stakeholders.

List of abbreviations

2W	two-wheeler	**LPG**	liquefied petroleum gas
3W	three-wheeler	**LEZ**	Low-emission zone
4W	four-wheeler	**LT**	low tension
ACT	average commercial tariff	**MCV**	medium commercial vehicle
AET	average electric vehicle tariff	**MNRE**	Ministry of New and Renewable Energy
ART	average residential tariff	**MoEFCC**	Ministry of Environment, Forest, and Climate Change
ARAI	Automotive Research Association of India	**MoF**	Ministry of Finance
BEV	battery electric vehicle	**MoHIPE**	Ministry of Heavy Industries and Public Enterprises
BPO	business process outsourcing	**MoP**	Ministry of Power
BSO	battery swapping operator	**MoRTH**	Ministry of Road Transport and Highways
CAA	Clean Air Act	**MV Act**	Motor Vehicle Act
CAGR	compounded annual growth rate	**NDC**	nationally determined contribution
CEM	Clean Energy Ministerial	**NCR**	National Capital Region
CERC	Central Electricity Regulatory Commission	**NEV**	new energy vehicle
CMVR	Central Motor Vehicle Rules	**NHAI**	National Highways Authority of India
CNG	compressed natural gas	**NTPC**	National Thermal Power Corporation
CO_2	carbon dioxide	**OEM**	original equipment manufacturer
COP	Conference of the Parties	**PHEV**	plug-in hybrid electric vehicle
CPO	charging point operator	**PLI**	production-linked incentives
COVID-19	coronavirus disease	**PSU**	public sector undertaking
DERC	Delhi Electricity Regulatory Commission	**RE**	renewable energy
DHI	Department of Heavy Industry	**REI Expo**	Renewable Energy India Expo
DISCOM	power distribution company	**RMI**	Rocky Mountain Institute
EESL	Energy Efficiency Services Limited	**RPO**	renewable purchase obligation
EoDB	ease of doing business	**RTO**	Regional Transport Office
EoI	expression of interest	**SCV**	small commercial vehicle (also referred to as light commercial vehicles)
EoL	end of life	**SECI**	Solar Energy Corporation of India
ETS	employee transportation services	**SERC**	State Electricity Regulatory Commission
EU	European Union	**SIAM**	Society of Indian Automobile Manufacturers
EV	electric vehicle	**SLA**	Service Level Agreement
EVSE	electric vehicle supply equipment	**SMEV**	Society of Manufacturers of Electric Vehicles
FAME India	Faster Adoption and Manufacturing of (Hybrid &) Electric Vehicles in India	**STU**	state transport undertaking
FICCI	Federation of Indian Chambers of Commerce & Industry	**SWS**	social welfare surcharge
FoR	Forum of Regulators	**SUV**	sports utility vehicle
GCC	gross cost contract	**TCO**	total cost of ownership
GHG	greenhouse gas	**ULB**	urban local body
GoI	Government of India	**UNFCCC**	United Nations Framework Convention on Climate Change
GST	Goods and Services Tax	**USD**	United States dollar
HCV	heavy commercial vehicle	**USO**	universal service obligation
HT	high tension	**VAT**	Value-added Tax
ICE	internal combustion engine	**WBCSD**	World Business Council for Sustainable Development
IPDS	Integrated Power Development Scheme	**ZEV**	zero-emission vehicle
LoA	letter of agreement		

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Photos from the EV policy roundtable discussions at WBCSD India Day 2019 and REI Expo 2019

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DISCLAIMER

This report has been developed in the name of WBCSD. Like other WBCSD publications, it is the result of a collaborative effort by members of the secretariat and senior executives from member companies. A wide range of members reviewed drafts, thereby ensuring that the document broadly represents the perspective of the WBCSD membership. Input and feedback from stakeholders listed above was incorporated in a balanced way. This does not mean, however, that every member company or stakeholder agrees with every word.

ABOUT WBCSD'S TRANSFORMING URBAN MOBILITY PROJECT

Transforming Urban Mobility brings together leading companies across the extended mobility value chain to spearhead the mobility system transformation. We have three projects across three intersecting areas: decarbonization, digitalization and behavior change. Through these projects, we develop tools, guidance and policy recommendations to support the transport sector on its path to achieving global climate targets and Sustainable Development Goals. We design and advocate for solutions that help companies advance their own sustainability transition and play a leading role in delivering sustainable urban mobility in cities around the world.

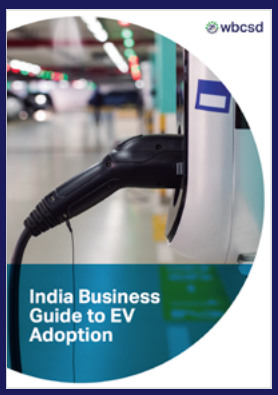
ABOUT WBCSD'S REMOBILITY COALITION

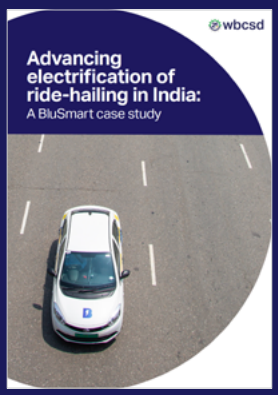
Our REmobility project brings together businesses representing over 10 billion kilometers of mobility in India, of which 250 million annual vehicle kilometers have been electrified.

The objective of REmobility in India is to support the business adoption of electric vehicles, energy storage and renewable energy. The project will meet these objectives by identifying market barriers, sharing knowledge and collaborations, reviewing regulatory and policy frameworks, creating innovative business models and setting up scalable demonstration projects.

We are working with companies and experts from various parts of the national EV value chain, including original equipment manufacturers, charging infrastructure providers, battery manufacturers, utilities, renewable project developers, information and communications technology (ICT) providers and corporate end customers. As of May 2021, over 100 experts and decision-makers from different parts of the EV value chain, including some institutional partners and end customers, have agreed to share time and expertise to help meet our common objectives.

As part of our efforts to accelerate vehicle fleet electrification in India under the REmobility coalition, a series of reports have been produced by WBCSD's REmobility coalition





ABOUT WBCSD

WBCSD is a global, CEO-led organization of over 200 leading businesses working together to accelerate the transition to a sustainable world. We help make our member companies more successful and sustainable by focusing on the maximum positive impact for shareholders, the environment and societies.

Our member companies come from all business sectors and all major economies, representing a combined revenue of more than USD $8.5 trillion and 19 million employees. Our global network of almost 70 national business councils gives our members unparalleled reach across the globe. Since 1995, WBCSD has been uniquely positioned to work with member companies along and across value chains to deliver impactful business solutions to the most challenging sustainability issues.

Together, we are the leading voice of business for sustainability: united by our vision of a world where more than 9 billion people are all living well and within planetary boundaries, by 2050.

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