



ROADMAP TO 2030

Enabling a Global Transition
to Zero Emission Vehicles

THE ZEV TRANSITION COUNCIL (ZEVTC)

Launched in 2020, the ZEVTC is a political dialogue that convenes ministers and representatives from most of the world's largest and most progressive automotive markets to collectively address some of the key challenges in the transition to ZEVs. This includes work to strengthen international support for a truly global transition.

THE GLOBAL COMMITMENT

At COP27, several members of the ZEVTC launched a Global Commitment to Strengthening International Assistance for EMDEs in the Road Transport Sector. In this, governments committed to working systematically together – with wider partners – to strengthen the coordination, accessibility, availability, and inclusivity of international assistance.

THE ZEVTC INTERNATIONAL ASSISTANCE TASKFORCE (IAT)

Convening global technical and financial support providers and experts as well as governments, the IAT was established in 2022 to strengthen coordination of international development assistance by providing a platform for dialogue, knowledge exchange, and collaboration.

THE BREAKTHROUGH AGENDA

Launched by world leaders at COP26, the Breakthrough Agenda is an international collaboration framework for countries, businesses, and civil society to join up and strengthen their actions across key emitting sectors, including road transport.

EXECUTIVE SUMMARY

The Global Zero Emission Vehicles (ZEV) Transition Roadmap presents the collective actions we¹ intend to undertake with other international partners to accelerate the transition to ZEVs in emerging markets and developing economies (EMDEs) to help make ZEVs the most affordable, accessible, and attractive option in all regions by 2030.² The Roadmap, the first of an annual publication planned through 2030, articulates how we intend to build year-on-year momentum and deliver real-world impact.

The Roadmap recognises the risks of inaction this decade, such as more countries being left behind, a multi-tiered global auto market becoming entrenched,³ and the transition to ZEVs not significantly contributing to efforts to achieve the Paris Agreement's global temperature goal.⁴ Greenhouse gas (GHG) emissions from road transport continue to rise faster than any other sector, accounting for over 10% of global GHG emissions today and being the second largest sub-sector source of GHGs globally after coal power.⁵ Moreover, without stronger coordination with the energy sector, it will be challenging to achieve a zero-emission transition.

The Roadmap also recognises the extensive benefits for EMDEs of an accelerated transition. These benefits include improved air quality from reductions of tailpipe particulate matter and nitrogen oxide emissions by nearly 70%; a reduction of CO₂ emissions by more than 60%; the avoidance of more than 5,300 million barrels of oil, equivalent to about 25% more than the total oil consumption in EMDEs in 2020,⁶ and millions of new jobs created.

The Roadmap places the needs and priorities of EMDEs front and centre, having been extensively shaped by the unique experiences of many types of EMDE countries and regions throughout the work of the ZEV Transition Council (ZEVTC) and partners over the last several years. Developed by the world-leading experts and initiatives of the ZEVTC International Assistance Taskforce (IAT), the Roadmap is also informed by the Breakthrough Agenda's recommendations and the ambition of the COP27 Global Commitment.

The Roadmap's actions will build on existing frameworks and initiatives to grow the amount of affordable financing available, improve the coherence and accessibility of the offer, and target catalytic change across road transport. Framed by the five most pressing strategic challenges, the Roadmap's actions focus on: (1) building capacity across EMDEs to develop and implement policy action; (2) improving access to and scaling finance; (3) increasing the availability of ZEVs in EMDEs; (4) accelerating charging infrastructure roll-out; and (5) the lifecycle management of ZEVs, electric vehicles (EVs), and battery components.

The Roadmap outlines the initial delivery framework; a finalised framework will be launched by COP29 to deliver both existing and new Roadmap actions to 2030. Providing a centre of gravity that convenes a breadth of experiences, expertise, and networks, the Roadmap's delivery framework will help strengthen the international coordination, collaboration, and dialogue that will be crucial for accelerating the global transition to ZEVs this decade.

State of the ZEV Transition in 2023

The transition to ZEVs is accelerating, driven by a range of factors that include countries' CO₂ mitigation policies. In 2022, over 10 million electric passenger cars and buses were sold (up from 2.98 million in 2020) and spending on clean road transport globally exceeded US\$425 billion (up 50% relative to 2021).⁷ In terms of oil use, this led to 0.7 million barrels per day being avoided (up from 0.3 million in 2020).⁸ This is equivalent to nearly 6% of the total on-road vehicle oil consumption per day for EMDEs in 2020.⁹ However, despite positive progress, modelling results from the International Council on Clean Transportation (ICCT) show that the current pace of the global ZEV uptake is still not sufficient to achieve the Paris Agreement's global temperature goal.¹⁰

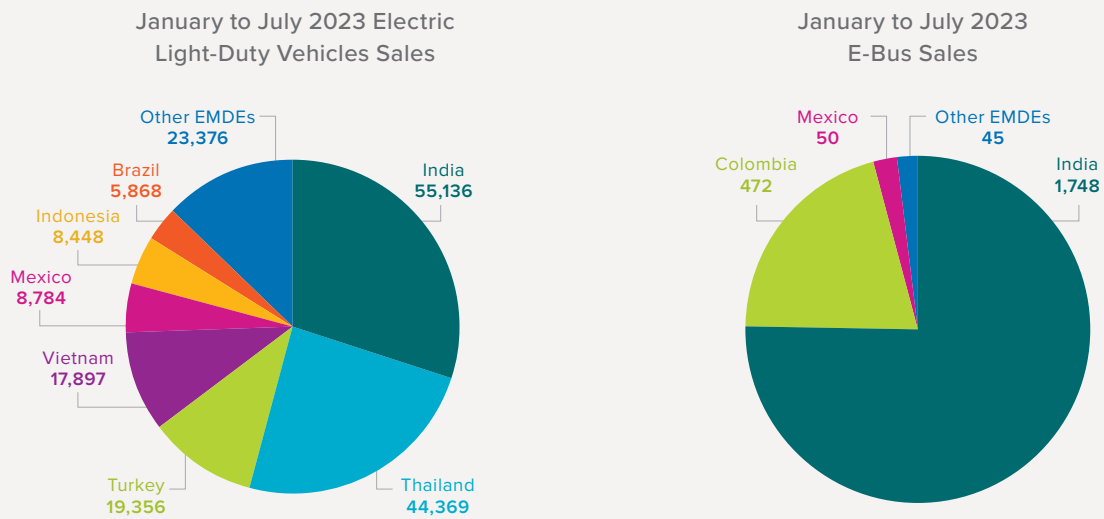
EMDEs account for nearly a quarter of light-duty vehicles (LDV) sales and one-third of all vehicle sales globally.¹¹ However, most progress in ZEV adoption to date has occurred in several high-income countries and China, with the gap in adoption between these countries and EMDEs growing wider. The risk of a multi-tracked global transition is rapidly growing across most vehicle segments¹²— for example:

- As of July 2023, year-to-date, EMDEs (excluding China) accounted for only 3% of global sales of zero-emission LDVs, compared to the 82% of sales in the top six leading markets.¹³ More than 80% of new zero emission LDVs in EMDEs were sold in just seven countries (Figure 1).
- In the medium- and heavy-duty vehicle segments, a limited number of EMDEs currently have some uptake of electric buses, and there has been little to no uptake of electric trucks to date. For the latter, an exception is Mexico, where purchase orders for approximately 1,700 electric trucks and vans were issued in 2022.¹⁴
- Charging infrastructure deployment in EMDEs is at an early phase and development data is scarce. As of May 2023, a total of approximately 56,000 public charging stations were installed across the 24 EMDEs where data is available, accounting for only 2% of the global stock of public chargers at the end of 2022.¹⁵ Robust and interoperable charging infrastructure networks will be critical for supporting an accelerated transition.

However, this is not the case for every segment. Electrification of two- and three-wheelers continues to gain significant momentum in many EMDEs. For example, sales of electric two-wheelers have reached nearly 2 million in Vietnam as of October 2023, and have reached more than half a million in India as of August 2023.¹⁶ Globally, sales of electric two- and three-wheelers were reported to be 9.2 million in 2022.¹⁷

ICCT’s model projections (Figure 2) show that without additional ZEV policies beyond 2022, well-to-wheel¹⁸ CO₂ emissions from cars, vans, buses, and trucks in EMDEs will increase by more than 80% in 2050 over 2020 levels.¹⁹ An accelerated ZEV transition could lower CO₂ emissions by more than 60% in EMDEs in 2050, compared to the 2050 level without the accelerated transition.²⁰ At a global level, this translates to a reduction of nearly 7 Gt of CO₂ emissions in 2050, equivalent to nearly 80% of the total global CO₂ emission estimates in 2020.

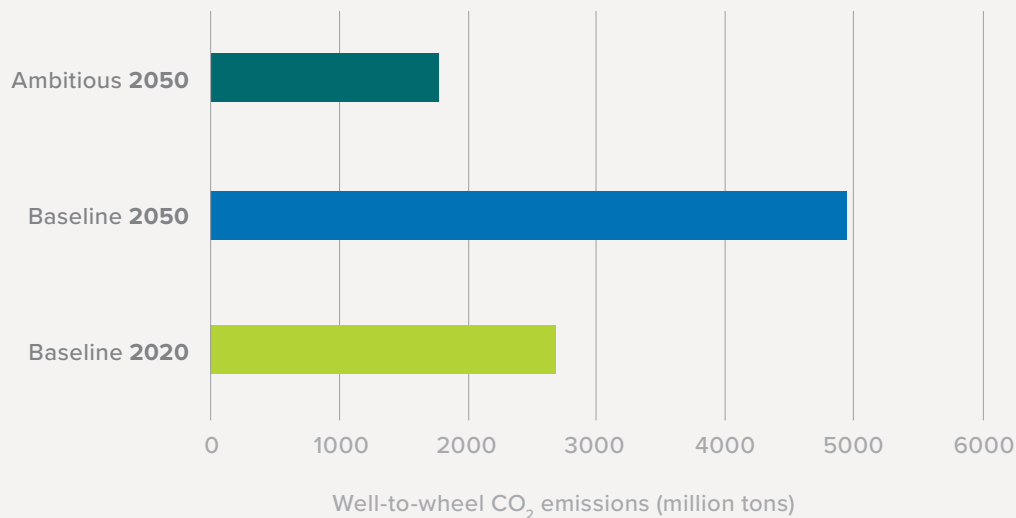
Figure 1. January to July 2023 sales for zero-emission light-duty vehicles and electric buses in EMDEs.



On a cumulative basis, this leads to global emissions reduction of 78 Gt CO₂ from 2020 to 2050, which is more compatible with the Paris Agreement’s global temperature goal. An accelerated ZEV transition, alongside strengthened support and enhanced coordination across regions, can become a reality across EMDEs, unlocking a myriad of other estimated benefits such as:²¹

- Cutting tailpipe particulate matter (PM) and nitrogen oxide (NOx) emissions by nearly 70% in EMDEs in 2050, leading to significant air quality and health benefits for communities.

Figure 2. ICCT estimates of 2020 well-to-wheel CO₂ emissions (million tonnes per year) from cars, vans, buses, and trucks in EMDEs (excluding China) and projections for 2050 under various policy scenarios.



- Avoiding consumption of more than 5,300 million barrels of oil in EMDEs by 2050, which is about 25% more than the 2020 total oil consumption in EMDEs.
- Providing millions of employment opportunities, with projections from the International Energy Agency (IEA) showing over 4.2 million people working in EV manufacturing jobs by 2030.²² The IEA estimates that the increase in electric vehicle manufacturing job opportunities from 2019 to 2030 has the potential to make up for 90% of the internal combustion engine (ICE) manufacturing job reduction during the same timeframe.

However, there are many complex challenges faced by across all types of EMDE countries that could hinder the transition to ZEVs.²³ For example, there is currently a widespread absence of regulatory frameworks for both ZEV and ICE vehicles,²⁴ a significant informal transport sector,²⁵ and a lack of regulatory and technical service capacity for new technology, such as for the lifecycle management of ZEVs, EVs, and battery components.

In addition, there is also a low availability of affordable and suitable ZEVs for EMDEs and a lack of fiscal incentive mechanisms, which is coupled with the significant import of cheaper, used ICE vehicles and a low availability of affordable asset finance. There is also a lack of public charging infrastructure, as well as unreliable electricity supply and distribution networks. With only 25% of power fuelling the current global EV stock being renewable and a continued heavy reliance on fossil fuels in many regions, strong coordination with the energy sector will be vital for a zero-emission transition.²⁶

Nevertheless, many first-movers are successfully overcoming multiple challenges and taking actions to help drive an accelerated transition – for example, by prioritising shared mobility or highly utilised vehicles for electrification, such as buses in Latin American countries and two- and three-wheelers in Southeast Asian countries.²⁷ Many also look to light and affordable transport modes, such as e-bikes and microcars, as promising segments for quick transition due to their resource efficiency, availability, lower capital costs, and lower power demand.

Some first-movers have also signalled their ambition globally, such as the 14 EMDEs that have signed the COP26 ZEV Declaration on cars and vans, and the 7 EMDEs that have signed the Global Medium- and Heavy-Duty Vehicles Memorandum of Understanding (Global MoU).²⁸ Combined, these countries account for about 10% of global CO₂ emissions and 15% of global PM_{2.5} and NO_x emissions.²⁹ Most COP26 ZEV Declaration and Global MoU signatories have

vehicle manufacturing industries and are oil importers, which the IAT's 2023 research³⁰ highlighted were factors that led to countries being particularly proactive in ZEV-related policy making and implementation.

Delivery partners, financiers, and EMDEs all call for stronger coordination and targeted support so a just transition can happen, in the interest of all stakeholders.

Although international collaboration and support for zero-emission road transport is increasing rapidly – covering demand creation, infrastructure, trade, and the alignment of targets for the pace of transition – many obstacles exist.³¹ For example, the lack of bankable

projects, limited access to timely and affordable finance at the scale needed, discrepancies in per capita investments in energy and decarbonisation plans, as well as gaps in technical expertise, institutional capacity, and data, all hamper the speed, scale, and impact of ZEV and charging infrastructure rollout, in addition to the establishment of effective lifecycle management for batteries and vehicles.

To effectively address these challenges, a holistic and systemic approach or global framework that puts EMDEs' experiences and needs front and centre is needed – one that not only increases the financing available, but also makes support easier to access, have greater coherence, and enables stronger coordination so catalytic change can be effectively targeted throughout the sector. Existing support mechanisms,³² as well as established platforms and funds, offer significant opportunities to do this whilst fostering dialogue amongst governments and other stakeholders.

Overcoming these challenges and other strategic, capacity, political, and technical barriers, in addition to optimizing existing opportunities, will be key to accelerating the ZEV transition in EMDEs this decade. Delivery partners, financiers, and EMDEs all call for stronger coordination and targeted support so a just transition can happen in the interest of all stakeholders. The following section provides an outline of the actions we intend to collectively take with wider partners to start making this a reality.



Accelerating Momentum this Decade

This section presents the five most pressing strategic challenges covering key aspects of the road transport sector, as identified by the experiences and concerns raised by different types of EMDEs throughout the work of the ZEVTC and wider partners over the last several years, including at the ZEV Regional Dialogues in 2021–2022. A suite of actions is outlined under each challenge, identifying what is planned to be collectively taken forward from 2024 to significantly improve the amount, coherence, accessibility, and impact of support for EMDEs this decade.

Where possible, actions will be undertaken through existing funds and fora and be implemented through the Roadmap's delivery framework to promote strong and holistic progress with wider public and private sector partners, including EMDEs, finance institutions, philanthropy, civil society, and wider assistance providers, amongst others. Although not detailed below, when applicable, actions are to be tailored to specific groups as well as individual EMDE countries,³³ recognising the range of unique needs and priorities that countries have.

ROADMAP TO 2030: CHALLENGES & SOLUTIONS



1. Building Capacity Across EMDEs to Develop and Implement Policy Action

- a. Launch a Country Cluster Initiative
- b. Launch a bilateral 'Twinning Capacity Building Programme'
- c. Develop and deliver a comprehensive training programme
- d. Scale the ZEV Rapid Response Facility
- e. Launch a scalable online platform
- f. Identify and utilise opportunities to bolster the coordination of existing support



2. Improving Access to and Scaling Finance

- a. Collectively coordinate resources by COP29 for e-mobility related support in EMDEs
- b. Identify and utilise opportunities to leverage the Collective for Clean Transport Finance work to foster greater trilateral collaboration
- c. Expand the World Bank's GFDT's Sub-Saharan Africa Regional Financing Facility and replicate this framework in more regions by 2025
- d. Scale the ZEV Country Partnership with India and look to replicate this Partnership model in up to two to three more EMDEs by COP29.
- e. Utilise diplomatic engagement to systemically raise awareness of funding options
- f. Strengthen coordination of funding processes and timings



3. Increasing the Availability of ZEVs in EMDEs

- a. Launch the Global Electric Bus Aggregation Framework
- b. Grow the ZEV Emerging Markets Initiative (ZEV-EM-I) India E-freight Demand Aggregation Framework to scale up electric trucks
- c. Explore options for establishing a new Global Aggregation Framework(s) for other transport segments
- d. Support the trade of affordable second-hand ZEVs and EVs across all segments



4. Accelerating Charging Infrastructure Roll-Out

- a. Amplify technical resources already available via existing initiatives and broader Roadmap activities
- b. Identify opportunities to replicate or expand existing technical resources to wider regions and different types of EMDEs
- c. Strengthen coordination between ZEV and energy transition initiatives
- d. Invite EMDE countries to participate in the ZEVTC Charging Infrastructure Taskforce
- e. Identify opportunities to build country and regional capabilities in areas related to charging infrastructure



5. Lifecycle Management of ZEVs, EVs and Battery Components

- a. Amplify existing technical resources and spotlight initiatives active in these topics via existing initiatives and broader Roadmap activities
- b. Identify opportunities to replicate or expand existing technical resources to wider regions and different types of EMDEs
- c. Identify opportunities to build country and regional capabilities in areas related to the lifecycle management of ZEVs, EVs, and battery components



1. Building capacity across EMDEs to develop and implement policy action

Evidence shows countries with strong e-mobility policy frameworks in place – particularly laws and mandates that build on a national roadmap or strategy and include foundational regulations that boost the supply of ZEVs (such as ZEV sales requirements, emissions regulations, fuel economy or greenhouse gas emission standards), as well as import duty exemptions and transport fuel taxation, amongst others – see a much faster transition at the national and sub-national scale.³⁴

Having a strong e-mobility policy framework in place can send a clear signal to global markets of a country’s ambition and intentions, facilitate finance de-risking, and support the achievement of the United Nations Sustainable Development Goals, as well as the implementation and achievement of a country’s nationally determined contribution under the Paris Agreement and wider mitigation strategies.³⁵

Policies to help boost the supply of ZEVs can also help create a competitive market and lead to economies of scale, including for battery suppliers and charging providers.³⁶ To significantly increase the number of EMDEs with such a framework in place before 2030, we intend to collectively – in partnership with existing programs and initiatives – do the following from 2024:

- a. Launch a Country Cluster Initiative** within the IAT structure to foster opportunities related to the development and implementation of strong e-mobility policy frameworks.³⁷ This initiative will convene interested EMDEs, initially prioritising those that either have a national roadmap or strategy in place or under development as of December 2023, and non-EMDEs that have similar economic models but are in different stages of policy action, to foster collaboration across regions. In addition to exploring options for future industry involvement and prospects for data sharing, the initiative will provide participating countries with opportunities to shape and provide input on current and future Roadmap activities.
- b. Launch a bilateral ‘Twinning Capacity Building Programme’** as part of the Country Cluster Initiative and IAT structure to pair interested countries for deeper experience-sharing in policy development and implementation. This will be coordinated with wider existing initiatives, including the ZEV Country Partnerships work.
- c. Develop and deliver a comprehensive and tailorable training programme** – initially for EMDE countries of the Country Cluster Initiative – which pools existing technical resources and expertise, such as webinars, workshops, and other knowledge products, to further support EMDE governments with the development and implementation of policy action related to Roadmap challenge areas. This is intended to be delivered in coordination with existing initiatives, including the Global Fuel Economy Initiative, Global Electric Mobility Programme, Global Facility to Decarbonise Transport (GFDT), the ZEV Rapid Response Facility, the ZEVWISE Initiative, and the International ZEV Alliance (IZEVA). The program will utilise tools such as the online platform (described below) to amplify existing technical and financial resources to countries.

Evidence shows countries with strong e-mobility policy frameworks in place see a much faster transition at the national and sub-national scales.

d. Scale the ZEV Rapid Response Facility by growing its network of world-leading experts and initiatives as well as by establishing funding for new and bespoke technical support.

e. Launch a scalable online platform to establish a clear and fully coordinated international digital architecture that improves the accessibility of existing support, with an initial focus on the five challenge areas and includes support on the development of investible projects. This platform will (i) collate information on existing funding routes, criteria, and access windows from across the provision, (ii) signpost EMDEs to partners’ websites and technical resources – including the Global Electric Mobility Program’s Global Repository, the Transport Data Commons Initiative, the NDC Partnership’s Global Practice Database and the TUMI E-Bus Mission Knowledge Hub on E-bus Projects, amongst others, and (iii) signpost EMDEs to key contacts and initiatives who can provide further technical support.

Launched as part of the Global Fuel Economy Initiative, this platform is planned to be delivered in coordination with existing initiatives and organisations, including the ZEV Rapid Response Facility, Global Electric Mobility Program, Sustainable Mobility for All, the ZEVWISE Initiative, the TUMI E-Bus Mission, the Transport Data Commons Initiative, the NDC Partnership, Cenex, the Multilateral Development Banks’ (MDBs) Working Group on Sustainable Transport, and the World Business Council for Sustainable Development, amongst others.

f. Identify and utilise opportunities to cooperate with and strengthen existing programs, and bolster the coordination of existing support that EMDEs receive regarding policy development and implementation.



Ministers of several ZEVTC member countries gather in Leipzig, Germany during the ITF Summit in 2023. *Photo courtesy of ZEVTC.*



2. Improving Access to and Scaling Finance

Raising awareness within EMDEs of the availability of affordable finance and ensuring there is also the capability to successfully access such financing remain key challenges (e.g. through the development of bankable projects and creating enabling environments within countries for investment to flow). In addition, scaling finance across the public and private sectors to meet future needs, including via the replenishment of programmes and funds, as well as ensuring equal coverage and access across countries and regions will be crucial. A holistic approach to address challenges across these areas could lead to a step change in sectoral de-risking and unlock more investment at the scale needed to drastically accelerate the transition. Therefore, we intend to collectively – in partnership with existing programs and initiatives – do the following from 2024:

- a. **Collectively coordinate resources by COP29 – with wider public and private sector funders – for e-mobility related support in EMDEs**, including by replenishing and growing public and private sector finance for existing funding mechanisms and bodies that are active in the road transport sector, such as the Global Environment Facility, Green Climate Fund, Climate Investment Funds, GFDT, Mitigation Action Facility, and MDBs.
- b. **Identify and utilise opportunities to leverage the Collective for Clean Transport Finance’s (CCTF) work to foster greater trilateral collaboration** between the public sector (governments, other authorities and market regulators), strategic finance groups (asset owners, investors, and development financial institutions), and relevant industry leaders (original equipment manufacturers and industry networks) to scale private sector finance. This includes working together to establish an annual investors’ roundtable to help accelerate momentum this decade and jointly exploring ways to strengthen the link between EMDE ZEV projects and finance. This includes identifying opportunities to improve private sector outreach and grow investment in demonstrative projects that have the potential to be scaled or replicated.
- c. **Expand the GFDT’s Sub-Saharan Africa Regional Financing Facility and replicate this framework in more regions by 2025, prioritising those that are currently underrepresented in the existing offer,**³⁸ to improve the coverage of support. Delivered in coordination with the Global Electric Mobility Program, CCTF, and ZEV-RRF, amongst others, each facility is expected to convene EMDEs, existing initiatives and the private sector to systematically support the development of high-quality projects with sufficient scale and risk levels required for private sector investment.
- d. **Scale the ZEV Country Partnership with India,**³⁹ including its activities on electric freight (e-freight), charging infrastructure, and access to finance, and look to replicate (and tailor) this Partnership model in up to two to three more EMDEs by COP29. This will be implemented in coordination with existing and planned regional and country platforms, such as those under the Global Electric Mobility Program, GFDT, Climate Finance Leadership Initiative, the NDC Partnership and CCTF, amongst others. As part of the India Partnership,

Scaling finance across the public and private sectors to meet future needs will be crucial.

pilot national level coalitions to strengthen coordination, foster peer-to-peer learning, and help raise awareness of national level mechanisms for attracting and accessing international finance across policymakers, national development banks, and other country stakeholders. In addition, launch the National Data Sharing Platform to scale the deployment of charging infrastructure in India and leverage digital technologies to inform demand-driven infrastructure planning, catalyse investments in infrastructure and support India's energy transition.

- e. **Utilise diplomatic engagement, Embassy networks, and wider government networks, as well as intergovernmental meetings** to systemically raise awareness, including in EMDEs, of existing funding options and opportunities.
- f. **Strengthen coordination of funding processes and timings across the international provision** by working with multilateral development banks and global funders – through the IAT and the MDB Working Group on Sustainable Transport – to identify opportunities to make funding routes more transparent and easily accessible.



3. Increasing the Availability of ZEVs in EMDEs

A key stage in the transition is ensuring an adequate supply of new and second-hand ZEVs across all vehicle segments to scale a country's fleet. Many obstacles can slow this process, including manufacturing capacity, original equipment manufacturer access and willingness, investor risk tolerance, procurement processes, diverging standards, high upfront costs and import duties, amongst others. The significant import of cheaper, used ICE vehicles can also have a significant impact across these areas.

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Strong enabling policies and innovative business models are key to increasing ZEV availability in EMDE markets

Key to overcoming these challenges is having strong enabling policies and innovative business models in place to increase ZEV availability in EMDE markets, such as those that account for and provide creative solutions to local level barriers to EV adoption, including range, price, and charge time. Enacting regulations, such as those that require and support the production and sale of a per-

centage of ZEVs by automakers, will also play a role in growing supply. Therefore, to help meet EMDEs' supply needs ZEVs across segments, we intend to collectively – in partnership with existing programs and initiatives – do the following from 2024:

- a. **Launch the Global Electric Bus (e-bus) Aggregation Framework to scale e-bus deployment in EMDEs**, identifying demand for tens of thousands of new e-buses by 2025 and supporting radical global market growth to help deploy hundreds of thousands of e-buses within the following decade. This program – which will be led by the CCTF in coordination with governments, industry, and existing e-bus initiatives – will engage with individual EMDEs to understand what their individual e-bus needs are so that these can be aggregated across regions and addressed through the Global Framework. Also, in coordination with actions under the Roadmap's policy and finance challenge areas, the Framework will support EMDEs in establishing policy environments and market conditions to enable successful adoption and scale-up.

- b. As part of the ZEV Country Partnership with India, grow the ZEV Emerging Markets Initiative (ZEV-EM-I) India E-freight Demand Aggregation Framework to scale up electric trucks (e-trucks),** deploying at least 5,000 e-trucks by 2027 and at least 7,700 e-trucks by 2030. Led by the CCTF – in coordination with governments, industry, and e-truck initiatives, including the new Fleet Electrification Coalition – explore options for scaling this program into a Global E-freight Aggregation Framework for launch by 2025.
- c. Explore options for establishing a new Global Aggregation Framework(s) for other transport segments** by 2025, utilising lessons learnt from the actions outlined above on e-buses and e-trucks, with further details to be outlined in the next Roadmap.
- d. Support the trade of affordable second-hand ZEVs and EVs across all segments by using a multi-pronged approach that includes the following actions from 2024:**
 - i. Formally establish a dialogue between interested export countries as part of UN Environment Programme (UNEP)-led work, including under the Road Transport Breakthrough action on trade conditions,⁴⁰ to identify opportunities for closer collaboration on export standards.
 - ii. As part of the Roadmap activities on policy action and lifecycle management, convene interested governments – in coordination with existing activities led by UNEP, the International Transport Forum and the World Bank, amongst others – to share experiences and best practices on these topics, as well as provide technical support where applicable. Through this, identify further actions based on the needs of EMDEs, such as improving data and information flows or policy development and implementation, for inclusion in existing initiatives and future Roadmaps.



The first 50 fully-electric buses deployed in São Paulo, Brazil in September 2023 through the ZEBRA Partnership. *Photo courtesy of ICCT.*



4. Accelerating Charging Infrastructure Roll-Out

Charging infrastructure has a significant positive impact on ZEV uptake.⁴¹ Subsidies for expanding charging infrastructure have also been found to be up to six times more cost effective at encouraging ZEV purchases than direct purchasing subsidies.⁴² However, EMDEs face many and significant obstacles that hamper charging infrastructure rollout across urban and rural areas, including grid capacity, data access, financing, and interoperability, amongst many others. Addressing these challenges and encouraging greater harmonisation and standardization across countries, regions and sectors could present significant opportunities to encourage much greater vehicle uptake across all segments, as well as better accessibility across demographic groups.

Further important considerations are the energy sources of the grid, such as renewables, as well as the long-term climate-resilience of charging infrastructure.⁴³ Therefore, to significantly scale and accelerate the roll-out of climate resilient charging infrastructure across EMDEs this decade, we intend to collectively – in partnership with existing programs and initiatives – do the following from 2024:

- a. Amplify the significant number of technical resources already available via existing initiatives and broader Roadmap activities.** This includes the Global Electric Mobility Programme's EV Charging and Grid Integration Tool, the Regulatory Assistance Project's extensive briefing on scaling EV charging infrastructure, the Green Finance Institute's EV Infrastructure Charging Guide, World Business Council for Sustainable Development's work on value frameworks and financing charging infrastructure, and extensive analytical publications from the IEA, ICCT, CALSTART, IZENA and Cenex, amongst many others.
- b. Identify opportunities to replicate or expand existing technical resources on charging infrastructure to wider regions and different types of EMDEs,** such as the technical resources listed above as well as others developed by the initiatives and partners included in the Roadmap. As part of this work, collaborate with existing initiatives and the private sector to identify opportunities to embed a more systematic approach to data and technical resource sharing to assist in the national and regional planning and operation of charging infrastructure. This includes standardised tools that have investor buy-in and those that can be adapted at the national level.
- c. Strengthen coordination between ZEV and energy transition initiatives,** with an initial focus on the global and regional levels, by building on dialogues between the ZEVTC and IAT, with the Energy Transition Council, the Clean Energy Ministerial Electric Vehicle Initiative, the Energy Sector Management Assistance Program (ESMAP) and Sustainable Energy for All (SEforALL), amongst others.
- d. Invite EMDE countries to participate in the ZEVTC Charging Infrastructure Taskforce** and the development of the ZEVTC Global Infrastructure Policy Roadmap in 2024.
- e. Identify opportunities to build country and regional capabilities in areas related to the development and deployment of charging infrastructure.** This will be done through, for example, cooperating with and strengthening existing programs, and strengthening the coordination of existing support that EMDEs receive. By also utilising the Road Transport Breakthrough's coordination process on charging infrastructure as well as broader Roadmap activities, develop additional actions based on the needs of EMDEs for future Roadmaps and/or existing initiatives.

Encouraging greater harmonisation and standardization of charging infrastructure could present significant opportunities to encourage much greater vehicle uptake across all segments.



5. Lifecycle Management of ZEVs, EVs and Battery Components

The recycling of ZEV and EV battery components, including for the manufacturing of new batteries, presents a breadth of economic, social, and environmental benefits for countries. However, capabilities to recycle battery components and manage end-of-life battery waste effectively and safely continues to present significant challenges across regions. The safe disposal of end-of-life vehicles also presents complex challenges, particularly as the flow of these vehicles grows due to their increased affordability.

The long lead-time needed to establish effective recycling and end-of-life management systems means action is urgently needed now to meet future demands. To support EMDEs and regions in embedding effective, safe, and sustainable end-of-life management and recycling capabilities, we intend to collectively – in partnership with existing programs and initiatives – do the following from 2024:

- a. Amplify existing technical resources and spotlight initiatives active in these topics via existing initiatives and broader Roadmap activities, including the new UNEP and GEF supported end-of life EV initiative.** Resources include the TUMI E-bus Mission’s Measures Catalogue for Improving Circularity of Batteries Used in E-buses, as well as publications and research by UNEP, the Global Battery Alliance, Circular Cars Initiative, the OECD and IZEVA, amongst many others.
- b. Identify opportunities to replicate or expand existing technical resources on lifecycle management to wider regions and different types of EMDEs.** These include the technical resources listed above as well as others developed by the initiatives and partners included in the Roadmap. As part of this work, collaborate with existing initiatives and the private sector to identify opportunities to embed a more systematic approach to data and technical resource sharing that could help countries develop a circular economy – from the design and production of vehicles and batteries, through to their safe disposal and recycling.
- c. Identify opportunities to build country and regional capabilities in areas related to the lifecycle management of ZEVs, EVs, and battery components** through, for example, cooperating with and strengthening existing programs, and strengthening the coordination of existing support that EMDEs receive. By utilising the Road Transport Breakthrough’s coordination processes on battery supply chains and trade conditions, as well as broader Roadmap activities, develop additional actions based on the needs of EMDEs – from improving international flows of information and scaling international efforts to policy development and implementation – for future Roadmaps and existing initiatives.

The recycling of ZEV and EV battery components presents a breadth of economic, social, and environmental benefits.



Used electric truck batteries await recycling at a plant in California.

Photo via Getty Images.

Support in 2024 from the ZEVTC International Assistance Taskforce

To inform future versions of this Roadmap, including new strategic challenges to address, we request the IAT collectively considers the following areas in coordination with wider partners, initiatives, and the Breakthrough Agenda process:

- Financing mechanisms that could most impactfully drive initiatives in EMDEs. Linked to this, forming an understanding of the amount of public and private sector finance that is needed by EMDEs this decade for e-mobility, the amount currently available, the gap between these two, as well as the opportunities to link resourcing for e-mobility and energy transition related support.
- Encouraging domestic and regional technical development and manufacturing capabilities across EMDEs.
- Enhancing upstream and downstream ZEV and battery supply chain sustainability in EMDEs, including retaining the value of batteries through refurbishment, remanufacturing, and reuse.
- Growing opportunities for the international harmonization of import and export regulations for used and end-of-life ICE vehicles, EVs, and ZEVs to EMDEs, in addition to recognising the growing issue of vehicle dumping in EMDEs as the transition to ZEVs accelerates.
- Promoting a just transition that considers the workforce implications and engages the workforce. As part of this, identifying opportunities to mainstream gender analysis in road transport where relevant, including areas regarding behavioural changes.
- Scaling the electrification of informal transport sectors in EMDEs.
- Building partnerships with non-ZEV initiatives and sectors to strengthen the offer, including those working on active mobility and the energy transition.
- Defining how ZEVs and associated charging infrastructure roll-out can help increase adaptation and resilience, including linking to and supporting broader action in these areas (e.g. under the Sharm El-Sheikh Adaptation Agenda).

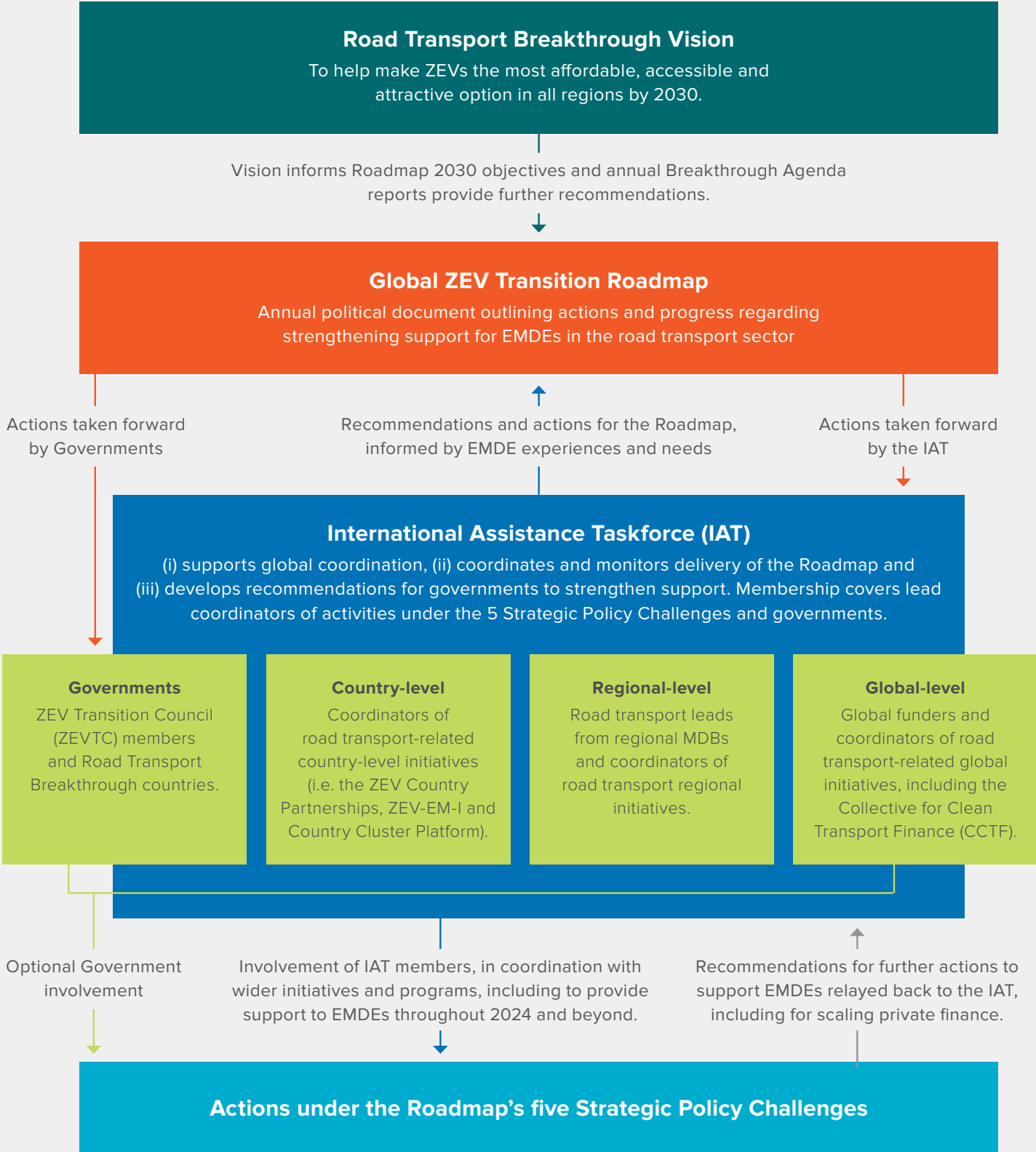


Delivering Progress This Decade

To deliver the actions outlined in the Roadmap, we intend to work with partners to establish and resource an initial delivery Framework to strengthen coordination and address fragmentation in 2024. This framework is illustrated in the figure below.

We intend to finalise our **delivery Framework by COP29** to accelerate momentum over the coming years and deliver actions through to 2030. This Framework, as well as future Roadmap strategic challenges and actions, will be informed by the IAT, including by its existing and future mapping exercises,⁴⁴ and through working with wider partners and initiatives. The enabling of strong and continuous engagement with EMDEs throughout activities over the coming years for maximum benefit and impact across all regions will also be crucial. Oversight of the actions in this Roadmap, including progress on their delivery, will be provided by the IAT with regular updates channelled to the ZEVTC members and participants in the Road Transport Breakthrough, as well as be included in future Roadmaps.

Figure 3. Illustrating the delivery Framework to strengthen coordination among international initiatives.



ENDNOTES

- ¹ The ZEV Transition Council (ZEVTC) as well as the non-ZEVTC members who are donor countries and have endorsed the Road Transport Breakthrough priority action 2.
- ² The Roadmap is not legally binding and participating countries are not necessarily involved in each activity listed. In this Roadmap, the term emerging markets and developing economies (EMDEs) encompasses all of the following unique groupings of countries, with each based on per capita gross national income: Upper-Middle Income Countries; Lower-Middle Income Countries; Low Income Countries; and Least Developed Countries (OECD DAC List, 2023).
- ³ BloombergNEF, “EV Outlook,” June 2022.
- ⁴ To hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels.” (2015 Paris Agreement, UNFCCC).
- ⁵ Statista (2023). <https://www.statista.com/statistics/1167298/share-ghg-emissions-by-sub-sector-sector-globally/>
- ⁶ Estimates are based on the ICCT’s Roadmap model and relative to the projected 2050 baseline scenario; detailed information on all the above figures is given in the Roadmap’s section, “State of the ZEV Transition in 2023.”
- ⁷ International Energy Agency, “Global EV Outlook 2023,” <https://www.iea.org/reports/global-ev-outlook-2023>
- ⁸ International Energy Agency, “Global EV Outlook 2023.”
- ⁹ ICCT Roadmap model (2023), <https://theicct.github.io/roadmap-doc/versions/v2.2/>
- ¹⁰ Arijit Sen and Joshua Miller, Vision 2050: Update on the global zero-emission vehicle transition in 2023, (Washington, DC: ICCT, 2023), <https://theicct.org/publication/vision-2050-global-zev-update-sept23/>
- ¹¹ Sen and Miller, Vision 2050: Update on the global zero-emission vehicle transition in 2023.
- ¹² BloombergNEF, “EV Outlook”
- ¹³ EV VOLUMES.COM, (2023), <https://www.evvolumes.com/>; China is the only EMDE that is competitive with other leading markets and is the global leader across all segments.
- ¹⁴ CALSTART and Drive to Zero, Technology and Commercialization Pathways for Zero-Emission Medium- and Heavy-Duty Vehicles in Mexico (2023).
- ¹⁵ EV VOLUMES.COM, (2023). <https://www.evvolumes.com/>
- ¹⁶ MotorCycles Data, (2023), <https://www.motorcyclesdata.com/>; data for India shared by UC Davis.
- ¹⁷ “Global EV outlook 2023.”

- ¹⁸ Well-to-wheel emissions include well-to-tank and tank-to-wheel emissions, where well-to-tank emissions represent emissions from fuel production, processing, distribution, and use, and tank-to-wheel emissions are the tailpipe emissions. These well-to-wheel emissions are different from life-cycle analysis which additionally includes emissions related to vehicle production and end-of-life emissions from material recycling, recovery, and disposal.
- ¹⁹ ICCT Roadmap model (2023), <https://theicct.github.io/roadmap-doc/versions/v2.2/>; two- and three-wheelers were outside the scope of CO2 emissions modeling due to data limitations.
- ²⁰ An accelerated shift to ZEVs (“Ambitious-2050” scenario in Figure 1, right) means a vast majority of global vehicles sales to be zero emission by 2040 and 100% of global ZEV sales by 2045. A “Baseline-2020” scenario represents adopted and finalized policies as of March 2023, and a “Baseline-2050” scenario accounts for the projected effects of adopted policies and anticipated market developments through 2050. More details can be found in Vision 2050: Update on the global zero-emission vehicle transition in 2023.
- ²¹ Estimates provided other than for employment opportunities are for 2050, relative to the projected 2050 baseline and based on the ICCT’s Roadmap model.
- ²² International Energy Agency, “World Energy Employment Report,” (2022), <https://www.iea.org/reports/world-energy-employment>; this figure covers employment in EMDEs and includes the total number of workers (full-time equivalents) involved in the manufacturing of vehicles. Please note that in projections, the authors assume countries maintain the same level of vehicle imports and exports as today, relying on the same suppliers. The same goes for the import and export of vehicle components.
- ²³ UC Davis “Facilitating a transition to zero-emission vehicles in the global south,” (2023), <https://zevtc.org/facilitating-a-transition-to-zero-emission-vehicles-in-the-global-south/> – this research, which was funded by the FIA Foundation, was produced by the International Assistance Taskforce and has been extensively used to inform the actions outlined in this Roadmap; Tanzila Khan et al., A critical review of ZEV deployment in emerging markets, (Washington, DC: ICCT, 2022), <https://theicct.org/publication/zev-market-review-global-feb22/>.
- ²⁴ E.g. a central strategy or roadmap, fuel economy and emissions standards, ZEV mandates, ICE phase-out targets, and fuel taxation (noting also the link between subsidising transport fuels with energy security and e-mobility competitiveness).
- ²⁵ The informal transport sector is run by private providers and has no official fleet, routes and operational management (TUMI, 2022 & UITP, 2021). The informal nature of the transport sector in EMDEs impedes electrification efforts, due to upstream issues in the sector and business organisation that requires investments, skill training and business models that enable operators to monetize Electric OPEX long-term benefit (as opposed to the current cash-based low-CAPEX focused business model) – tackling multifaceted challenges, such as these, can help unlock demand for fleet modernization and support electrification of the sector.
- ²⁶ SLOCAT Partnership Transport, Climate and Sustainability Global Status Report – 3rd edition (2023).
- ²⁷ UC Davis (2023), Facilitating a transition to zero-emission vehicles in the global south; Khan et al., (2022), A critical review of ZEV deployment in emerging markets.

- ²⁸ ZEV Declaration commitment: “working towards all sales of new cars and vans being zero emission globally by 2040, and by no later than 2035 in leading markets.” Global MoU commitment: “working together to enable 100% zero-emission new truck and bus sales by 2040 with an interim goal of 30% zero-emission vehicle sales by 2030.”
- ²⁹ ICCT Roadmap model (2023), <https://theicct.github.io/roadmap-doc/versions/v2.2/>
- ³⁰ UC Davis (2023), Facilitating a transition to zero-emission vehicles in the global south.
- ³¹ See Annex for an overview of existing activities happening at the global and regional levels.
- ³² Such as grants, loans, technical and policy assistance, and tools and knowledge sharing products from various international agencies and organisations, philanthropic institutions, multilateral development banks and regional partnerships/initiatives.
- ³³ Upper-Middle Income Countries; Lower-Middle Income Countries; Low Income Countries; and Least Developed Countries, OECD DAC List (2023).
- ³⁴ An electric mobility roadmap is defined here as an action plan that includes targets and policy measures along with their implementation timelines, institutional responsibilities, and resource requirements. For a comparison of EV uptake rates in countries with different types of policy frameworks, see: ‘Facilitating a Transition to Zero-Emission Vehicles in the Global South.’
- ³⁵ Particular development goals include poverty alleviation (SDG1), health and wellbeing (SDG3), gender equality (SDG5), affordable and clean energy (SDG7), decent work and economic growth (SDG8), industry, innovation and infrastructure (SDG9), reducing inequality (SDG10), sustainable cities and communities (SDG11), responsible consumption and production (SDG12) and climate action (SDG13).
- ³⁶ These types of policies can also help ensure the market price becomes aligned with what consumers are willing to pay.
- ³⁷ As informed by the recommendations in ‘Facilitating a Transition to Zero-Emission Vehicles in the Global South.’
- ³⁸ As identified by the IAT in their 2022-23 mapping exercises of existing global- and regional-level support, which also looked at the coverage of existing international assistance initiatives across regions.
- ³⁹ Currently led by the UK, US, and World Business Council for Sustainable Development.
- ⁴⁰ Covering both the harmonisation of quality standards for used ICE vehicles, as well as commitments to support the international trade of second-hand ZEVs.
- ⁴¹ From multiple sources, such as the “Global EV Outlook”, multiple ICCT publications (2022), World Bank analysis (2022) and “Facilitating a Transition to ZEVs in the Global South.”
- ⁴² World Bank, “The Economics of E-Mobility for Passenger Transportation,” (2022).
- ⁴³ Resilience against climate change related shocks, including extreme weather events.
- ⁴⁴ Since 2022, the IAT has mapped existing global- and regional-level ZEV-related international assistance activities to identify gaps and areas of potential duplication. The initial findings informed this Roadmap. Mapping will continue from 2024, expanding to new geographies and stakeholders (including not-for-profits and private consultancies).

ANNEX

OVERVIEW OF EXISTING INITIATIVES AND THEIR PLANS FOR 2024

Signatories of the COP27-launched [Global Commitment](#) requested an update of the international assistance landscape “to improve the transparency and accessibility of current assistance available, and to identify and address gaps or weaknesses in the current provision.”

The following presents a non-exhaustive list of global- and regional-level initiatives that, as of 2023, are actively supporting emerging markets and developing economies (EMDEs) in the electric mobility space, including in areas related to charging infrastructure and supply chains. The list also summarizes the recent activities of the initiatives and plans for the coming year.

We intend to continue identifying opportunities through the Zero Emission Vehicles Transition Council (ZEVTC) International Assistance Taskforce and wider [Global ZEV Transition Roadmap](#) delivery framework to further strengthen support and enhance coordination across the international landscape in 2024 and beyond.

Accelerating to Zero (A2Z) Coalition

Launched at COP26 by a leadership group of more than 100 countries, businesses, and organisations, the ZEV Declaration commits to working towards all sales of new cars and vans being zero-emission globally by 2040, and by no later than 2035 in leading markets. At COP27, the [A2Z Coalition](#) was launched to host the ZEV Declaration and provide a platform for the growing number of signatories—now over 220—to showcase their commitments, provide access to support and resources (including an international community of best practice), and track progress. For EMDE countries that have signed the ZEV Declaration, additional bespoke support—including via the ZEV Rapid Response Facility (see further details below)—is provided to help countries meet their ambitions.

Asia-Pacific Initiative on Electric Mobility

Coordinated by UN Economic and Social Commission for Asia and the Pacific (ESCAP), the [Initiative](#) aims to help accelerate the transition to electric mobility across the region. With a focus on public transport fleets, activities include enhancing regional and multi-sectoral collaboration, as well as strengthening countries’ capacity to formulate national policies and strategies. In 2023, the initiative convened regional and sub-regional knowledge exchange meetings and delivered training courses, including in collaboration with research and academic institutions. The initiative also launched a range of technical resources, such as the publication *Electric Mobility in Public Transport: A Guidebook for Asia-Pacific Countries* and national e-mobility policy framework reports for Cambodia, Georgia, Nepal, Lao People’s

Democratic Republic, and Thailand. In 2024, the focus will be to implement the Guidebook, support countries in identifying financing mechanisms, as well as further capacity building and training activities.

Climate Compatible Growth (CCG) Programme

The [CCG Programme](#), which is funded by the UK Government, supports investment in sustainable energy and transport systems to meet development priorities in EMDE countries. It carries out a range of research and capacity building activities to help countries develop economic strategies, plans, and policies to attract investment in low-carbon growth. It does this by bringing together research organisations, local researchers, governments, multilateral development banks (MDBs), and international organisations to identify appropriate low-carbon development pathways. In 2023, CCG worked on several country- and regional-level projects, as well as supported broader initiatives, such as the Energy Transition Council and the development of policy briefs to support their goals in the lead up to COP27. In 2024, CCG will continue project implementation, including running a series of capacity building courses and trainings for countries on energy and transport.

Clean Technology Fund (CTF)

The [CTF](#), a sub-fund of the Climate Investment Funds, is scaling its support for cleaner transportation in EMDEs, including through improving public transits, vehicle efficiencies, and grid systems, as well as supporting modal shifts to help individual countries adopt cleaner technologies. In 2024, the Climate Investment Fund is planning to launch a Climate Smart Urbanisation programme, which will include electric mobility and wider sustainable transport.

Climate Technology Centre and Network (CTCN)

Hosted by the UN Environment Programme, the [CTCN](#) is the implementation arm of the Technology Mechanism of the UN Framework Convention on Climate Change. It helps to accelerate the transfer of environmentally sound technologies for low carbon and climate resilient development at the request of countries. By leveraging a global network of technology companies and institutions, the CTCN provides countries with technology solutions, capacity building, and advice on policy, legal, and regulatory frameworks. Recent projects include the development of a framework for real-time public transport information systems in Greater Dhaka and technical capacity enhancement for planning an urban public transport system in Vientiane, Lao PDR. Projects on sustainable mobility will continue to be implemented in 2024, as aligned with the CTCN's 2023–2027 Work Programme.

Collective for Clean Transport Finance (CCTF)

Launched at COP27, the [CCTF](#) convenes the public sector (authorities, policymakers, market regulators, and governments), strategic finance groups (asset owners and managers, banks, and development finance institutions), and relevant industry leaders (original equipment manufacturers and industry networks) to collaborate, curate, and connect zero emission transport projects with potential investors. In the short-term, CCTF leaders from across sectors will work on lighthouse projects that demonstrate the relevance of radical collaboration. These include the Global Facility to Decarbonise Transport's Sub-Saharan Africa Regional Financing Facility, the electric freight accelerator in India, and the Collective's global electric bus stream. In the longer-term, the CCTF aims to institutionalise a process that can create a global deal flow, associated asset classes, and scale investments in zero-emission technologies. In 2024, the CCTF will continue to gather momentum, including across the flagship e-bus and e-trucks projects and by establishing an annual investors' roundtable.

Decarbonising Transport Initiative

Coordinated by the International Transport Forum, the [Decarbonising Transport Initiative](#) promotes carbon-neutral mobility by providing decision makers with tools to select CO2 mitigation measures that deliver on their climate commitments, thereby helping governments and industry to translate climate ambitions into actions. It does this through continually building its catalogue of effective CO2 mitigation measures on the [Transport Climate Action Directory](#), providing targeted analytical assistance for countries and partners, gathering and sharing evidence of best practice, as well as building a global policy dialogue. In 2024, the Initiative will continue to support countries by tracking progress, providing in-depth sectoral and focal studies, assessing policy levers to support national pathways, and organising global dialogues through high-level roundtables, policy briefings, and technical workshops.

E-mobility Program for Sustainable Cities in Latin America and the Caribbean

Led by the Inter-American Development Bank, the [Program](#) aims to support a shift to low-emission and resilient transportation systems across the region. Over its lifetime, the Programme will provide US\$450 million in concessional loans and grants to nine countries (Barbados, Chile, Colombia, Costa Rica, Dominican Republic, Jamaica, Panama, Paraguay, Uruguay), including US\$200 million concessional finance from the Green Climate Fund (US\$145 million in loans and US\$55 million in grants). In 2023, the Program focused on outreach activities and missions to initiate the identification, preparation, or consolidation of projects to be considered. One of its first projects will enhance public transportation infrastructure in the City of Panama. In 2024, in addition to continuing the Program's implementation, the Inter-American Development Bank will continue work to develop [EMOVILAC, a regional digital platform](#) to virtually connect electromobility stakeholders, promote technical training, foster knowledge sharing, and establish multi-sectoral communities of practice.

Energy Sector Management Assistance Programme (ESMAP)

[ESMAP](#), a World Bank programme, provides technical assistance to help shape global energy policies and leverage significant development financing, with the aims of achieving universal energy access by 2030 and advancing decarbonisation. ESMAP supports multiple projects across regions that focus in part on charging infrastructure, noting the promising potential and role of electric mobility in supporting the energy transition. For example, in 2023, a project was approved to support Cabo Verde's low carbon development pathway that includes the development of an e-mobility roadmap for Cabo Verde's public transport. In 2024, additional projects with a focus on e-mobility and cleaner public transport, will be investigated for potential future implementation.

Global Electric Mobility Programme (GP)

The [GP](#) is funded by the Global Environment Facility (GEF) and other donors, with implementation led by the UN Environment Programme, the International Energy Agency, the Asian Development Bank, the European Bank for Reconstruction and Development, and Centro de Movilidad Sostenible. The Programme consists of over 50 country projects, four regional support and investment platforms, and four global thematic Working Groups. In 2023, the GP continued a breadth of activities, including the compilation of knowledge products and publications, the delivery of national projects, as well as regional trainings and capacity building. This year also saw the next phase of the GP being successfully approved under the 8th cycle of GEF, including over 25 new country projects targeting zero emission mobility (bringing the total to close to 70 country projects) and a new end-of-life programme.

Global Facility to Decarbonize Transport (GFDT)

The [GFDT](#), a World Bank programme, aims to accelerate innovation and investment that enables EMDE countries to build safe, modern, inclusive, and resilient transport systems that are not emissions intensive. To help EMDE countries achieve low-carbon pathways to development, the GFDT supports in areas related to the development and delivery of knowledge products as well as project preparation. The GFDT launched its first tranche of projects at COP27, which included activities to accelerate energy transitions in transport through new energy vehicles, electrification, the promotion of public transport and active mobility, and the development of innovative financing and funding frameworks. This included projects in the Egypt, Ghana, India, Pacific Islands, Peru, the Sahel, and Sub-Saharan Africa. The second tranche of projects for 2024 and beyond will be announced in late 2023.

Global Fuel Economy Initiative (GFEI)

The [GFEI](#) is a partnership of organisations (including the FIA Foundation, the International Council on Clean Transportation, UN Environment Programme, International Energy Agency, International Transport Forum, and the University of California, Davis) that supports transport decarbonisation at the global, regional, country, and sub-national levels. In addition to data development and analysis of fuel economy potentials, the initiative provides support for national and regional policy-making efforts as well as outreach to stakeholders. In 2023, the GFEI engaged in the work of the International Assistance Taskforce, including leading its Country Projects and Partnerships Working Group. Drawing on the GFEI's extensive experience and network of 100 countries, the Working Group published the [report](#) *Facilitating a transition to Zero-Emission Vehicles in the Global South*, which has been used extensively to inform the development of the Global ZEV Transition Roadmap. This year, the GFEI also updated its toolkit and led on several global networking events and, in 2024, will continue its work to provide expert input into the International Assistance Taskforce and Roadmap activities, as well as continue its capacity-building work across regions.

Global Memorandum of Understanding on Zero Emission Medium- and Heavy-Duty Vehicles (Global MOU)

Launched at COP26, the [Global MOU](#) has been signed by 27 countries committed to working together to enable 100% zero-emission new truck and bus sales by 2040, with an interim goal of 30% zero-emission vehicle sales by 2030. Seven of the signatories are EMDEs who are currently being supported by CALSTART's Drive to Zero Program, the Government of the Netherlands, and wider partners through capacity building and technical assistance to deliver against this ambition. In 2023, the Zero Emission Vehicle Island Taskforce was established by and for small island state MOU signatories to provide a platform for experience and knowledge sharing. In 2024, this work will be further scaled, with formalised linkages also made to wider existing initiatives.

Global Platform for Sustainable Cities (GPSC)

Funded by the GEF as part of a broader Sustainable Cities Impact Program, the [GPSC](#) is a knowledge platform that supports cities and local governments in undertaking integrated urban planning, implementing policies, and investing in nature-positive, climate-resilient, and carbon-neutral urban development. Led by the World Bank in partnership with several international and regional organisations, a key focus is the development and delivery of multiple learning activities on nature-positive urban development, including sessions on greening cities and urban heat. In 2023, the GPSC's activities have contributed to policy development, planning, implementation, and capacity-building programs at the local, national, regional, and

global levels. In 2024, the GPSC will continue to focus on supporting integrated and inclusive urban planning, multilevel action policy development, and municipal finance, as well as knowledge-sharing and capacity-strengthening. In total, the GEF's Sustainable Cities program works with 50 cities across 17 countries, through US\$310 million in GEF grants, leveraging nearly US\$4 billion in co-financing.

Green Climate Fund (GCF)

The [GCF](#), the world's largest climate fund, aims to accelerate transformative climate action in EMDEs through a country-owned partnership approach that uses flexible financing and climate investment expertise. Several GCF projects have a focus on road transport. For example, the [India E-mobility Financing Program](#) launched in 2022 has a total of nearly US\$1.3bn co-financing with the private sector and is the GCF's first purely private sector transport programme. In late 2023, the second GCF replenishment process took place for its 2024–2027 strategic period, with transport being a key sector considered for future financing.

High Volume Transport (HVT) Applied Research Programme

The [Programme](#) provides transport research that aims to make transport safer, greener, more affordable, accessible, and inclusive in low-income countries. The Programme supports policy, engineering, and technical research into a range of cross-cutting areas, such as climate change mitigation and adaptation, inclusion, gender, road safety, policy and regulation, technology and innovation, and fragile and conflict-affected states, as well as research uptake and capacity building. In 2023, HVT announced nine new projects based in Africa and South Asia that will develop research aimed at improving aspects of transport systems in low- and middle-income countries. In addition, it launched support tools, organised several events to spotlight the challenges of achieving inclusive and greener transport, and produced the second series of its Reimagining Motion podcast. In 2024, the HVT Programme will continue implementing these activities and projects, including those under its current research cycle, to further support EMDE countries.

Mitigation Action Facility (MAF)

The [MAF](#) – previously called the Nationally Appropriate Mitigation Actions (NAMA) Facility – enables EMDE countries to reduce their emissions through implementing sectoral decarbonisation projects as building blocks of Nationally Determined Contribution (NDC) implementation. The MAF awards grant funding through competitive annual calls for project proposals, in which applicants, in partnership with Governments, can request up to approx. £20m (EUR 25m) over 4–7 years. It is currently supporting several ZEV transition projects with a focus on public fleets, including active programmes on sustainable transport in Cabo Verde and Nepal. In 2023, the MAF received over 300 project applications, of which 25 are being taken forward to the next phase of development. In 2024, a new funding round is likely, with a focus on hard-to-abate sectors, including energy, industry, and transport.

NDC Transport Initiative for Asia

The [Initiative](#) aims to facilitate a paradigm shift to zero-emission transport across Asia by supporting countries—with a focus on China, India, and Viet Nam—to develop and implement comprehensive decarbonisation strategies. At the regional and global level, the Initiative facilitates the sharing of experiences across countries and promotes multi-stakeholder coordination between the public and private sectors. In 2023, activities included developing and delivering capacity building and technical support, facilitating international peer learning, convening focus groups, and conducting analysis. In 2024, this work will continue in addition

to projects such as supporting Guangdong Province to develop a greenhouse gas and air pollutant peaking roadmap for transport, working with India to identify contributions of the transport sector to its 2030 NDC, and offering technical support for long-term planning in Viet Nam and Thailand. The Initiative is funded by the German Ministry of Economic Affairs and Climate Action through the International Climate Initiative, with projects jointly implemented by GIZ, International Council on Clean Transportation, International Transport Forum, Agora Verkehrswende, SLOCAT Partnership, REN 21, and World Resources Institute.

SOLUTIONSplus

[SOLUTIONSplus](#) is a global platform that supports city-level demonstrations and the sharing of public and commercial electromobility solutions. In 2023, SOLUTIONSplus saw the validation of 10 ongoing living labs that have been testing innovative e-mobility solutions. The programme has also seen the replication of actions and tools in over 10 additional cities across Africa, Asia, Latin America and the Caribbean, Eastern Europe, and West Asia. This year, SOLUTIONSplus continued the platform's capacity building activities and the scaling up of actions to foster the wider roll-out of solutions. In 2024, SOLUTIONSplus is scaling its comprehensive e-mobility [toolbox](#) and institutionalising knowledge sharing across its regional [hubs](#) in Asia, Africa, Europe, and the Americas, with each hub providing an open platform for co-creation and capacity building.

Soot Free Urban Bus Fleets Project

The [Project](#) is funded by the Climate and Clean Air Coalition and is being delivered by C40 Cities Climate Leadership Group, International Council on Clean Transportation, UN Environment Programme, and the Centro Mario Molina Chile. It targets 20 cities across Africa, Asia, Latin America, and the Caribbean by supporting the development of roadmaps and pilot projects for low-emission public transport, including electric buses. In 2023, the Project worked with countries to develop soot-free roadmaps and has been linking its activities on electric buses trainings with those under the Global Electric Mobility Programme. Work on these activities will continue in 2024.

Transformative Urban Mobility Initiative (TUMI) E-bus Mission

The [TUMI E-bus Mission](#) supports the deployment of electric buses in 20 selected cities across three regions. The Mission focuses on forming global- and city-level coalitions of private and public sector actors, developing electrification roadmaps and targets, and facilitating knowledge sharing through training and workshops within a broader city network. The mission will support cities with preparations for the procurement of 100,000 electric buses by 2025. Activities in 2023 included the continuation of technical support for the 20 selected cities; the realisation of financing academies and investor roundtables to progress with procurement processes; and the delivery of trainings, workshops, webinars and in-person city dialogues within the TUMI City Network. This work will continue in 2024, alongside the elaboration of recommendations on including gender equity, workforce wellbeing and circular economy aspects into electric bus deployment.

UK Partnering for Accelerated Climate Transitions (UK PACT)

[UK PACT](#) is a UK Government funded programme that supports EMDE countries with high mitigation potential to increase their climate ambition and implement related policies more rapidly, effectively, and equitably. The programme, which explicitly focuses on partner government's needs and priorities, supports projects related to electric mobility in several partner countries under the programme, including Colombia, Mexico, Indonesia, and India. In 2023, the majority

of UK PACT's work on transport has been in Indonesia, with activities continuing into 2024. Scoping is also underway in Thailand, which may lead to new transport-focused projects starting in future.

UrbanShift

Funded by the GEF as part of a broader Sustainable Cities Impact Program, [UrbanShift](#) is supporting 23 cities across 9 countries – with integrated urban planning, low-carbon infrastructure, sustainable waste management and nature-based solutions for urban sustainability. Led by UN Environment Programme (with implementing partners including World Resources Institute, C40 Cities, ICLEI, the World Bank and the Asian Development Bank), UrbanShift develops and delivers technical resources, training (including via the UrbanShift's City Academy) and facilitates knowledge exchange opportunities. In 2023, the initiative focused on project implementation across focus countries, launched a new online city academy for sustainable urban planning, published several key reports, and hosted a range of events, including its first Asia forum that convened public and private sector stakeholders to exchange knowledge on regional urban challenges and solutions. In 2024, the above activities will continue as well as work to develop a knowledge and learning platform that connects cities worldwide with the tools, training and advocacy needed to put strategies into action. In total, the GEF's Sustainable Cities program works with 50 cities across 17 countries, through US\$310 million in GEF grants, leveraging nearly US\$4 billion in co-financing.

Zero Emission Area Programme

The [Zero Emission Area Programme](#) supports Green and Healthy Streets signatory cities and partners who are seeking to establish a major area of their city as zero emission by 2030. For example, on-request support is provided for areas such as Low Emission Zones, Zero Emission Delivery Zones and congestion charging. In 2023, the Programme supported and implemented research, engagement, and capacity building across regions. In 2024, a series of webinars and training on equity and zero emission area transport policies are being planned, alongside trainings, workshops, webinars and in-person city dialogues for signatory cities and partners. In addition, the Programme will launch a coalition on clean air policies with doctors and other health sector professionals.

Zero Emission Bus Rapid-deployment Accelerator (ZEBRA) Initiative

The [ZEBRA Initiative](#) looks to accelerate the deployment of zero emission buses in major Latin American cities by providing direct support to cities (Bogotá, Medellín, Mexico City, Santiago, São Paulo and Valparaíso) and by carrying out work, in partnership with bus manufacturers and financial institutions, to establish a procurement pipeline of over 6,000 e-buses in the region. The initiative also focuses on knowledge sharing activities, including via the [E-Bus Radar](#) platform. In 2023, the ZEBRA Initiative supported the development of new tenders for e-buses in Santiago and Valparaíso, as well as new business models in São Paulo, and helped implement new e-bus projects in Mexico City, among other activities. In 2024, the ZEBRA Initiative will expand to South Africa and India, help develop national level financial mechanisms to foster e-bus adoption in Brazil and Colombia, as well as undertake wider work on battery degradation and convene an e-bus investors roundtable, among other actions.

ZEV Emerging Markets Initiative (ZEV-EM-I)

Launched at COP27 by the US and UK Governments, in partnership with the World Business Council for Sustainable Development, the ZEV-EM-I fosters focused dialogues across businesses and governments in EMDEs to help forge partnerships that can expedite private

investments and bolster supportive public policies to enable a faster transition to ZEVs. In 2023, the Initiative hosted a series of high-level public-private dialogues across selected EMDE countries to help shape collective action while aligning with the existing stakeholder efforts and national priorities. Along with shaping public-private agreements in EMDEs, the [ZEV-EM-I](#) convenes CEOs along the ZEV value chain to create transport decarbonization strategies and inform charging infrastructure roadmaps. This work will continue to be linked to the activities of the CCTF, the ZEV Country Partnership with India, and the ZEV Transition Council's Charging Infrastructure Taskforce. In 2024, the ZEV-EM-I will continue its collective action under the ZEV Country Partnership with India, including the e-freight and infrastructure workstream, and will shape collaborative agreements in two to three new EMDE markets.

ZEV Rapid Response Facility (ZEV-RRF)

Launched at COP27, the [ZEV-RRF](#) provides agile technical support to EMDE countries that are decarbonising their road transportation sectors and transitioning to zero-emission vehicles. It aims to execute short-term (18 months or less), tangible projects that could have wider implications on the development and implementation of strategies, policies and regulations. The ZEV-RRF provides EMDE countries with a single point of entry to navigate and access support providers and world-leading experts. In 2023, the focus under the ZEV-RRF was to scale its network, begin implementation of its first projects, engage recipient countries, and establish funding for bespoke technical support. In 2024, this work will continue to help further scale the ZEV-RRF and grow its project pipeline.

ZEVWISE

Launched in 2023, the ZEVWISE Initiative is being spearheaded by the Government of the Netherlands and provides a framework to coordinate technical support and expertise on medium- and heavy-duty vehicles as well as charging infrastructure. This year, the ZEVWISE Initiative focused on scaling its network of partners as well as delivering webinars and hosting events on financing the transition to zero emission transport and charging infrastructure-related subjects. Partners include the Government of the Netherlands, CALSTART's Drive to Zero program, International Council on Clean Transportation, the Smart Freight Centre, the U.S. Department of Energy, the UK Government, the Electric Vehicles Initiative, the World Bank, WBCSD, the International Transport Forum, and the UN Environment Programme. In 2024, ZEVWISE will explore how and where support could be enhanced for EMDE countries on these vehicle segments.

