

FACILITATING A TRANSITION TO ZERO- EMISSION VEHICLES IN THE GLOBAL SOUTH

EXECUTIVE SUMMARY



This report reviews the status of energy and decarbonisation policies for road transport, paying specific attention to measures related to zero-emission vehicles (ZEVs). ZEVs are vehicles capable of travelling without tailpipe emissions of local pollutants and greenhouse gases: mainly battery electric (BEV), plug-in hybrids (PHEVs), and fuel cell electric vehicles (FCEVs). It builds on reviews of ZEV policy frameworks, additional desk research and inputs from a survey answered by around over 100 policymakers and stakeholders working in transport, energy and environmental policies in the Global South.

This work also benefited from inputs derived from the Global Fuel Economy Initiative (GFEI) experience, developed during more than a decade of work with countries in the Global South.

The geographical coverage of this analysis includes all members of the G20, the 20 most populated countries, signatories of the Acceleration to Zero Coalition and a selection of other countries that have been supported by the GFEI over the years, including markets in Africa, Latin America and Asia, encompassing a number of Small Island Developing States (SIDS).

Drawing on an analysis of different country clusters, this assessment identifies topics for which increased availability of funding from multilateral development banks for a ZEV transition can be strengthened. The analysis also suggests how to leverage the potential of existing platforms of international cooperation to facilitate key policy developments in Low- and Middle-Income Countries (LMICs), paying specific attention to cases with deep policy gaps to build capacity to receive and effectively use these disbursements.

STATUS OF THE ZEV TRANSITION

The ZEV transition has shown and keeps showing a positive momentum worldwide, in particular due to increased Electric Vehicle (EV) uptake. Although much of the focus received by EVs in the public debate is on cars, this is not the market segment where EVs reached the largest market shares. In 2022, two wheelers and buses saw a higher EV penetration, globally, than electric cars and light commercial vehicles.

Despite positive signals, the distribution of ZEVs across the world remains uneven. For two wheelers, the size of the EV market is largely led by with the 50 million electric motorcycles and low-speed "bikes" sold in China. The global regions with the largest market shares of e-buses are China (roughly

a quarter of all buses) and Europe (close to 12%). Chile and Colombia are home to the largest fleets of e-buses in the Global South after China. Significant differences in terms of EV adoption across global regions are also noticeable in the light vehicle segment, with only a fraction of electric car and light commercial vehicle sales occurring beyond Canada, China, Europe, the Republic of Korea, Japan, and the United States (US).

The low EV adoption in LMICs, observed in all segments (even though these markets contribute significantly to Internal Combustion Engine Vehicle (ICEV) sales, due to a growing vehicle ownership) is indicative of the challenge of decarbonising road transport in these geographies. Reasons for this are linked with the nature of these markets, often characterised by less reliable electricity supply, lower vehicle prices, comparatively low household incomes, low availability of asset finance at affordable rates and, especially in countries that do not have assets in the automotive value chain, significant flows of used vehicle imports.

STATUS OF CURRENT POLICY DEVELOPMENTS

Policy actions related with fuel economy improvements, the ZEV transition, a shift towards low-carbon electricity and the enhanced sustainability of the battery supply chains are also heterogeneous globally.

- Vehicle manufacturing countries have been more proactive than non-manufacturers in taking legislative action on all these topics.
- Countries that are net importers of oil and petroleum products are more likely to have policies on energy efficiency (fuel economy) and the ZEV transition (ZEV deployment and related infrastructure, in particular charging for EVs) than oil exporters or countries that are self-sufficient regarding their oil and petroleum product supply.
- High income countries (HICs) are generally ahead of LMICs in the development of environmental legislation, across the board.

FUEL ECONOMY

Policy developments on fuel economy took place to a greater extent on legacy technologies (ICE vehicles), especially amongst countries with vehicle manufacturing capacity, and also (thanks to opportunities to increase exports by limiting domestic demand) in high-income net oil/product exporting countries.

ZEV AND RELATED INFRASTRUCTURE

ZEV policies can offer opportunities to leapfrog some of the policy development stages typically characterising fuel economy policy. The best leapfrogging opportunities are found in:

1. SIDS;
2. Countries with automotive manufacturing facilities and that have already spotted a development opportunity from a shift to EVs; and
3. Countries that, as net importers of oil and petroleum products, see ZEVs as an opportunity to reduce their exposure to oil price volatility and other energy security risks, especially if their electricity generation is largely based on renewable energy.

Countries showing the largest distance from leapfrogging opportunities are net oil/petroleum product exporters or self-sufficient producers. Overcoming this specific challenge is especially important and likely to require dedicated activities.

DECARBONISATION OF THE ELECTRICITY GRID

Given their greater energy efficiency, ZEVs are less carbon intensive than ICEVs even before the electricity grid is fully decarbonised. However, decarbonising the electricity grid is instrumental in order to maximise the environmental, economic and health-related benefits of electromobility.

Improvements are possible - and more urgent - in LMIC markets which are still distant from having attained lower emission levels and significant growth expected in terms of scale, due to increased motorisation. Across all countries, based on emission intensity of the electricity grid, classification in terms of policy ambition, and market size, the following countries are amongst the main priorities: Iran, Egypt, Malaysia, Thailand (mainly for policy ambition and timelines), South Africa, and Uzbekistan and the United Arab Emirates.

BATTERY SUSTAINABILITY

Battery manufacturing, supply chain sustainability and end-of-life management is clearly the area with a major gap in policymaking, especially in medium to minor markets, but also - on the topic of sustainable sourcing of minerals - in most major markets but the European Union (EU). Reasons for this include both the novelty and the complexity of this subject

for transport policymaking, since the increasing competitiveness of ZEVs (in particular EVs) is a fairly recent phenomenon.

Policies and regulations to ensure that the framework in which ZEV policies are developed do not replicate unsustainable business models are decisive, especially in countries where mineral extraction and battery manufacturing has started or is set to start soon. Waste management (namely improve material recovery and recycling) could cover a considerable part of upcoming material demand, which would be urgently needed in LMICs, given their reliance on second-hand vehicles.

Policy action on batteries, from end-of-life management to supply chain sustainability, is clearly lagging in LMICs without a car manufacturing industry. Battery end-of-life management policies are more advanced in oil importing countries (due to greater interest in energy diversification) than in oil exporting ones, especially for LMICs.

The case with the deepest policy lag and the largest relevance in terms of size of the market affected is in countries with the presence of an auto manufacturing capacity and self-sufficiency or net oil/petroleum product exports. This confirms the criticalities already observed in the case of ZEV and charging infrastructure policies.

OPPORTUNITIES FOR PROGRESS

Despite remaining challenges, LMICs have the possibility to seize important opportunities from a global EV transition that is bound to continue over the next decades. Arguments that support this idea include:

- Capacity to address the twin objectives of emission reduction and development, by creating new value chains in the economy through the e-mobility ecosystem.
- Significant shares of vehicles with high rates of daily usage, including boda bodas, taxis, buses and light commercial vehicles, as they benefit the most from lower operational costs, and provide the most important mobility services in the form of public transit and first / last-mile connectivity.
- Low power demand for electric two-wheelers, making them better suited for charging in locations with a grid infrastructure that is still being developed.

- Limited exposure to the asset stranding risks than those faced by HICs with a strong automotive sector (even if asset stranding challenges also exist in LMICs, especially if they have a vehicle manufacturing industry and are fossil energy exporters).
- Opportunities – also relevant for the transition of vehicle maintenance, servicing shops and eventually larger assembly facilities – from the repowering/repurposing of ICEVs into BEVs, through retrofits.
- Additional opportunities, for countries with a high level of endowment in battery materials, to retain greater portions of the EV and battery value chain.

As HICs transition their economies towards greater alignment with sustainability (including through reductions in the emission intensity of the products that they use and trade), countries that have achieved a successful transition towards low-carbon electricity (and energy systems more broadly) are amongst those with the greatest chances to intercept opportunities to have access to export markets for their products. Making sure that all countries can effectively migrate towards this type of condition (as well as other sustainability requirements) will need to be taken as a priority.

NEED FOR ENHANCED POLICY ACTION

Policy action that helps kicking-off and sustaining the ZEV transition is a prerequisite to enable and ensure the economic viability of ZEV-related investments. The policy tools needed to stimulate the transition have already been identified and remain relevant to accelerate change.

- **SET CLEAR PRIORITY AREAS FOR POLICIES THAT WILL ENABLE THE ZEV TRANSITION**

Defining key policy tools and priority areas for policy action will be essential to enable and ensure the economic viability of ZEV-related investments. These include technical standards and regulations, information and communication, efficient levels of energy taxes and carbon prices, procurement, economic incentives, regulatory limits, green investment frameworks, trade policies, industrial development support, and workforce support. Rules are likewise needed to facilitate an effective functioning of the electricity market. The largest investments and funding

requirements needed for ZEV transition are crucial for cases with the biggest risk of a growing divide with a transition towards the biggest risk of a growing divide with a transition towards development aligned with the Sustainable Development Goals (SDGs), in particular countries that are net exporters of oil/petroleum products

- **FRAME THE ZEV POLICY ACTION IN A BROADER AGENDA FOR DEVELOPMENT AND SUSTAINABILITY**

Taking action to reduce remaining policy gaps needs to be framed in the context of a broader effort by HICs to support LMICs (especially countries with significant exports of products and services, or seeking that) to transition towards sustainability in a holistic way. A key reason for this is that LMICs risk facing trade barriers if HICs shift towards a development model that aims to generate value in a sustainable way (e.g. through the circular economy, ecosystem services or decarbonised and dematerialised, outcome-based services). A lack of support for LMICs to quickly develop policies enabling them to transition towards low-carbon technologies - including but not limited to ZEVs - risks to increase geopolitical tensions due to reduced access to major markets, as the HIC growth strategies are shifting towards a better alignment with the SDGs.

- **REDUCE THE COST OF CAPITAL FOR SDG- AND ZEV-ALIGNED INVESTMENTS IN LMICS**

Due to challenges for LMICs to get access to affordable capital and the possibility for Multilateral Development Banks (MDBs) to borrow (and therefore also lend) and at very favourable terms, an increase in the lending capacity of MDBs for projects characterised with a better alignment with the SDGs could be instrumental to facilitate access to affordable capital for all countries, freeing up opportunities to accelerate an inclusive transition. The development of an internationally agreed, science-based international classification system, establishing a list of environmentally and socially sustainable economic activities (a taxonomy) is a likely prerequisite to enable an effective increase of SDG-aligned MDB lending. As the work pioneered by the European Union demonstrates, a taxonomy of sustainable activities would most likely include ZEVs, low-carbon electricity and charging infrastructure.

- **LEVERAGE EXISTING PLATFORMS TO FACILITATE KEY POLICY DEVELOPMENTS IN LMICS**

Leveraging existing international platforms to facilitate exchanges between governments and other stakeholders working in LMICs can be a useful tool to share best practices and accelerate alignment with the SDGs and the ZEV transition. These platforms have already developed extensive networks and gathered subject-matter experts, making them effective in fostering sectoral and cross-sectoral dialogues and integrating dedicated activities to bridge capacity gaps for LMIC policymakers.

- **ELABORATE A COMPELLING VALUE PROPOSITION TO TRANSITION TOWARDS ZEV IN LMICS AND PROMOTE THE ENHANCEMENT OF CHARGING INFRASTRUCTURE AND LOW-CARBON ELECTRICITY POLICIES**

Proactive measures are needed to accelerate ZEV, charging infrastructure and low-carbon electricity policies. Opportunities for this transition include leveraging like-to-like situations, accelerating the electrification of highly-utilised vehicles, and transitioning to two-wheelers. Complementary measures may include right-sizing vehicles and batteries, and seeking consensus on economic diversification strategies for oil/petroleum exporting countries.

- **ENSURE THAT ALL WORLD REGIONS DEVELOP BATTERY RECYCLING CAPABILITIES, AND ALL COUNTRIES ESTABLISH REGULATORY STANDARDS FOR THE END-OF-LIFE MANAGEMENT OF BATTERY MATERIALS AND THE SUSTAINABILITY OF THEIR SUPPLY CHAINS**

The sustainability of batteries and their supply chains have been identified as a critical bottleneck for the EV transition. International cooperation and initiatives to align battery

production with environmental sustainability must be reinforced to ensure that all world regions develop battery reuse and recycling capacities and establish procedures for the end-of-life treatment of battery materials and governance standards. Adherence to the United Nations' Universal Declaration of Human Rights, and making proactive efforts to develop an inclusive governance, will also be key for a successful, ethical transition to ZEVs.

- **SUPPORT IMPROVEMENTS IN SECOND-HAND VEHICLE TRADE**

Improvements in the second-hand vehicle trade can be enabled by providing better access to data and by taking a macro-regional approach to support greater harmonisation in policies (e.g. across all Africa). This will facilitate the development of a stronger framework that would tighten up technical inspections and trade flows. It will be important to balance the advantages and the disadvantages that a reduction in second-hand vehicle exports from HICs could have on affordability of enhanced access to mobility and environmental impact, since it could trigger demand for ICEVs from other producing countries which have potentially less strict emissions regulations.

- **ASSIST LMICS TO ADOPT ROAD USER CHARGES, AMONG OTHER MEASURES, AS A SOLUTION TO BRIDGE BUDGETARY CHALLENGES**

Road user charges are likely to be important to make up for lost fuel-duty revenues accompanying the ZEV transition and to adequately price vehicle use. The shift to road user charges is complex. It requires anticipation and finding a balance between stimulating innovation while addressing revenue shortfalls and social equity impacts. A digital transition could significantly facilitate the application of road user charges, and enhancing support for this development in LMICs is important for an economically sustainable ZEV transition.



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