Transport Pathways to Reach Climate and Sustainability Goals

SLOCAT Partnership on Sustainable, Low Carbon Transport

TRANSPORT, CLIMATE AND SUSTAINABILITY GLOBAL STATUS REPORT

4TH EDITION

MODULE 2

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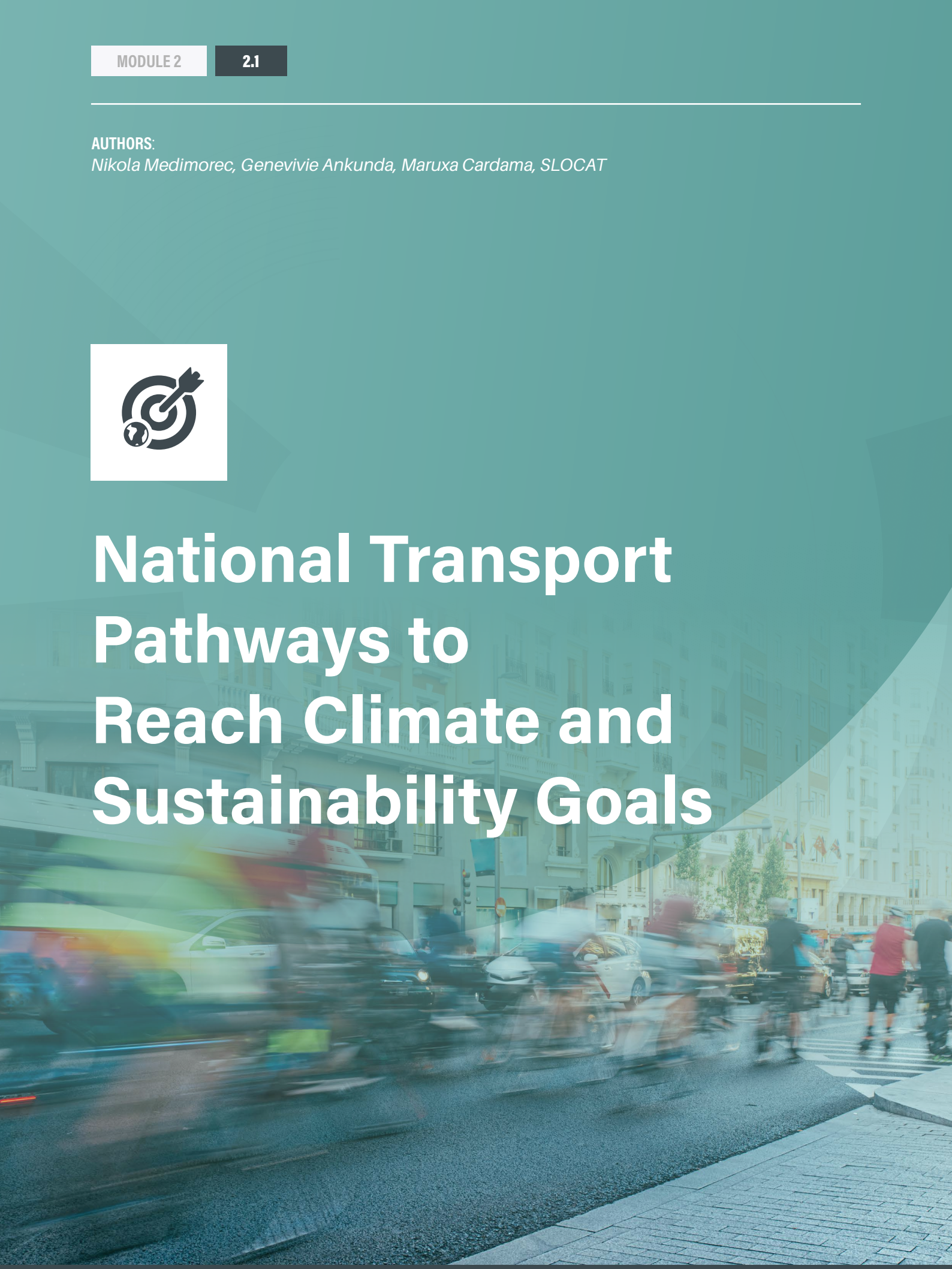
National Transport Pathways to Reach Climate and Sustainability Goals



KEY FINDINGS

Context, challenges and opportunities

- Expanding efficient, accessible, affordable, safe, sustainable, and resilient passenger and freight transport services is one of the most impactful actions to enable inclusive communities and shared prosperity on a liveable planet, while also advancing global climate, sustainability and resilience goals.
- Countries will need to accelerate transformation of the transport sector if they wish to achieve the objectives of key international agreements that aim for improved sustainability and resilience by 2030 and decarbonisation by 2050: the Paris Agreement on Climate Change, the 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction 2015-2030.
- Overall, countries are not on track to achieve these global agendas. Efforts to implement these global agendas – as well as climate, sustainability and resilience efforts in transport – are unfolding at a time of heightened geopolitical tension, domestic challenges in many countries, and increased scrutiny of public spending on climate and sustainability action.
- It remains critical to strengthen the linkages between national transport policies and the mechanisms for implementing and tracking progress on the Paris Agreement, the 2030 Agenda and the Sendai Framework. This can help assure that progress towards climate change mitigation and adaptation, as well as sustainability in transport, is anchored in and connected to efforts to achieve social inclusion, shared and resilient prosperity, and health and environmental protection.

National transport policies in support of sustainable, low-carbon transport

- National transport policies form the backbone of efforts to transform the transport sector. Countries outline their commitments to transport development through national master plans, infrastructure development strategies and broader economic policy documents. However, not all transport measures support sustainability, resilience or climate action.
- The number of countries with dedicated national strategies for sustainable, zero-emission transport increased between 2023 and 2025.

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Outcomes of the first Global Stocktake on the implementation of the Paris Agreement

- In 2023, the UN Climate Change Conference in Dubai, United Arab Emirates (COP 28) concluded with a decision on the first Global Stocktake (GST) to scale up climate action by 2030 and extend efforts to 2035. The GST highlighted the urgency of decarbonising the transport sector, calling on countries to accelerate efforts towards "the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero- and low-emission vehicles".

- The GST underscores the need for integrated strategies that take into account transport demand management; proximity planning; shifts to less polluting transport modes; multi-modal infrastructure and services for public and collective transport, rail, walking, cycling, and freight transport and logistics; and technological innovation for cleaner, safer, more resilient and accessible transport systems. Such strategies are increasingly urgent as transport demand continues to grow and as hundreds of millions of people in low- and middle-income countries seek to gain access to transport services.

- Through the first GST, nearly every country in the world agreed (for the first time) to "transition away" from all fossil fuels to achieve net-zero greenhouse gas emissions. Other key actions of the first GST that are expected to greatly transform transport include tripling renewable energy capacity, doubling energy efficiency improvements and phasing out inefficient fossil fuel subsidies.

Nationally Determined Contributions under the Paris Agreement

- Most countries (95%) missed the initial deadline of 10 February 2025 for submitting third-generation NDCs to the UNFCCC. The UNFCCC later extended the deadline to September 2025 to give countries more time to outline their climate actions to 2035.

- As of 1 August 2025, only 29 third-generation NDCs had been submitted to the UNFCCC. The third-generation NDCs submitted as of August 2025 continued the trend of an increasing share of mitigation targets for transport greenhouse gas emissions within each NDC generation.

- So far, the third-generation NDCs have embraced a wider portfolio of transport emission mitigation actions but focused heavily on electrification; the 29 NDCs submitted as of August 2025 featured 7.9 transport emission mitigation actions each on average, up 36% from 5.8 actions each on average in the second-generation NDCs.

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- As of August 2025, only two third-generation NDCs (Lesotho and Nepal) included targets for transport adaptation. By comparison, six second-generation NDCs had transport adaptation targets.
- A parallel assessment of 22 third-generation NDCs as of June 2025 found that the featured commitments would result in greenhouse gas emissions of 51.1 gigatonnes of CO_2 equivalent by 2035 (around 36% from transport if accounting for the current NDC submissions). Although this represents a reduction of 1.4 gigatonnes of CO_2 equivalent compared to 2030 levels, it is still well above the emission levels required to limit warming to 2 degrees Celsius (°C) (36 gigatonnes) or 1.5°C (25 gigatonnes) by 2035.
- The second generation of NDCs, completed in 2024, comprised 154 submissions (153 countries plus the 27-member European Union), enabling a complete picture of countries' transport climate actions to 2030.
- Studies from October 2024 found that the commitments in second-generation NDCs were insufficient to meet the Paris Agreement target of keeping global warming to 2°C and were still far from achieving the 1.5°C limit. The ambitions in second-generation NDCs would still result in global warming of 2.1°C to 2.8°C by the end of the century, depending on underlying assumptions and major uncertainties. Even if all NDC commitments were implemented, the carbon budget to stay within 1.5°C would be used up by 2032.

Long-Term Low Emission Development Strategies under the Paris Agreement

- As of August 2025, 78 LT-LEDS (Long-Term Low Emission Development Strategies) had been submitted to the UNFCCC; however, only 3 were from low-income countries (Burkina Faso, Ethiopia and Gambia), indicating an ongoing gap among countries in laying out their long-term climate ambitions.
- A total of 21 LT-LEDS (27%) were submitted in 2023 and 2024, with 4 more (Burkina Faso, Equatorial Guinea, Lebanon and Peru) submitted in 2025 (as of August). All of the LT-LEDS submitted between 2023 and August 2025 featured transport actions.
- Among the 78 LT-LEDS submitted as of August 2025, 23 (30%) outlined transport greenhouse gas mitigation targets. New LT-LEDS with transport emission targets were from Armenia, Belize, Burkina Faso, Ireland, Nigeria, Oman, Peru, Serbia, Solomon Islands, the United Arab Emirates and Vanuatu.
- Only 19 of the 78 LT-LEDS as of August 2025 (24%) featured transport adaptation actions, including 9 LT-LEDS submitted between 2023 and August 2025.
- The ambition levels in countries' LT-LEDS are not sufficient to meet all global warming goals under the Paris Agreement. An assessment of the 68 LT-LEDS

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submissions as of 25 September 2023 found that even if all of the actions were fully implemented and delivered on time, the greenhouse gas emissions from submitting countries would fall only 63% below 2019 levels by 2050.

- A key shortcoming of NDCs and LT-LEDS is the delayed timing of emission reductions: as of 2023, two-thirds of the planned reductions were for the period 2030-2050, making it impossible to remain within the 1.5°C global warming limit as the carbon budget to stay within 1.5°C would be used up by 2032.

Commitments and initiatives at recent United Nations climate conferences

- The 2021 UN Climate Change Conference in Glasgow, United Kingdom (COP 26) kicked off an unprecedented number of commitments and initiatives on sustainable, low-carbon transport. These efforts have continued to develop and grow, with every subsequent UN Climate Change Conference adding new initiatives or multilateral agreements.
- In the lead-up to the 2023 UN Climate Change Conference in Dubai, United Arab Emirates (COP 28), a group of organisations launched a call to double the share of energy-efficient and fossil-free forms of land transport by 2030, with the goal of fossil-free land transport by 2050. The call to action attracted more than 60 multi-stakeholder signatories (including Chile and Colombia) and emphasised shifts towards public transport, walking, cycling, and rail freight, as well as electric vehicles and railways, while drastically scaling up the use of renewable and zero-emission energy sources.
- Building on the call to action and other multi-stakeholder efforts, the Climate Champions Team launched the Avoid and Shift Breakthrough at the 2024 UN Climate Change Conference in Baku, Azerbaijan (COP 29).
- Since COP 28, Colombia, Costa Rica and Nigeria have signed the ZEV Declaration of the Accelerating to Zero Coalition (A2Z).
- During 2023 and 2024, five new countries – Cabo Verde, Ethiopia, Ghana, Mozambique and Seychelles – joined the Global MOU, committing to 30% sales of zero-emission new trucks and buses by 2030 and 100% by 2040.
- Transport initiatives launched during COP 28 included: the Alliance for Cycling and Walking Towards International Vitality (ACTIVE), the Call to Action for Transformative Urban Planning / 15MC (15-minute cities), Cargo Owners for Zero Emission Vessels (coZEV), the Coalition for High Ambition Multilevel Partnerships (CHAMP), the Future is Public Transport Coalition and the Green Maritime Africa Coalition (GMAC).
- At COP 28, the UN Climate Change High-Level Champions and the Marrakech Partnership for Global Climate Action released the 2030 Climate Solutions, which laid out near-term milestones and actions for various sectors (including transport) and enablers (finance, technology, planning and capacity building).

National Adaptation Plans under the UNFCCC

- National Adaptation Plans (NAPs) were initially developed as a tool for least developed and developing countries to identify, address and review their priorities, actions and activities on climate change adaptation. Burkina Faso and Cameroon submitted the first NAPs to the UNFCCC in October 2015, and since 2023 high-income countries have also been invited to submit NAPs.
- Unlike NDCs, which are time-bound, NAPs offer greater flexibility in setting out adaptation strategies, including in the transport sector, which is highly vulnerable to climate impacts. As of 2019, natural hazards caused around USD 15 billion in direct damages to transport systems annually, mainly in lower-income economies.
- As of 1 August 2025, a total of 74 countries had submitted NAPs, of which 58 (78%) were from low- and middle-income countries. The number of NAPs increased significantly between 2023 and August 2025, with nearly half (48%) of submissions occurring during this period (35 total, including 23 in 2023 and 2024 and 12 in 2025).
- Transport features prominently in many NAPs, with countries outlining activities for enhanced infrastructure resilience and transport system adaptation.

Sendai Framework for Disaster Risk Reduction 2015-2030

- The Sendai Framework for Disaster Risk Reduction 2015-2030 is an agreement to raise a country's resilience against natural hazards and extreme weather events.
- A 2023 mid-term review of the Sendai Framework noted the high unlikelihood of achieving the framework's goals by 2030, given trends in disaster risk reduction and limited progress in achieving other global agreements.
- As of October 2024, a total of 163 countries had reported on the global targets through the Sendai Framework Monitor; 81 countries had reported on all seven targets,

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and 107 countries had reported on all targets related to the UN Sustainable Development Goals (SDGs). None of these assessments highlighted specific insights on transport systems and infrastructure.

Voluntary National Reviews under the 2030 Agenda for Sustainable Development

- The UN 2030 Agenda for Sustainable Development is a cross-cutting, interconnected agenda, wherein the achievement of one of the 17 SDGs is often dependent on the achievement of others. Although no stand-alone SDG is focused on sustainable, low-carbon mobility, the successful implementation of efficient, accessible, affordable, safe, sustainable, and resilient passenger and freight transport services supports the achievement of almost every SDG.
- As of 2025, effectively every country involved in the SDG process had submitted a Voluntary National Review (VNR) and in some cases multiple VNRs.
- Since the first High-Level Political Forum in 2016, countries have reported on transport as a vital sector to implement the SDGs, showcasing on-the-ground implementation and best practices. VNRs from the period 2016-2022 revealed consensus on transport's role as a key contributor to SDG implementation.
- As of mid-2025, only 18% of the SDG targets that had sufficient data coverage (139 out of 169 total targets) were on track to be achieved by 2030; a further 17% showed moderate progress, 31% showed marginal progress, 17% had stagnated, and 18% had regressed below the 2015 baseline.
- Of the SDG targets with sufficient data coverage and most relevant to transport, target 3.6 on reducing road traffic crashes and target 9.1 on access to all-weather roads recorded marginal progress, indicating that significant acceleration is needed. Although the UN data to assess progress on target 11.2 (access to public transport systems) are insufficient, other data show that 52% of the urban population on average had convenient access to public transport during 2020-2022.
- In Africa, analysis from 2023 found that both target 3.6 and target 9.1 had regressed in the region. Overall, Africa had made progress on 13 of the 17 SDGs but was lagging on 4 key goals: SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action). Of the 115 SDG targets with sufficient data coverage, only 4 showed moderate progress.
- In the Asia-Pacific region, all SDGs except SDG 13 (Climate Action) recorded progress as of 2024, although at the current pace the region would not achieve all SDGs before 2062. A benchmarking of the transport sector in Asia-Pacific against other regions, based on 20 SDG-related indicators, found that Asia-Pacific performed better in nine indicators.
- For Latin America and the Caribbean, a 2024 study projected that only 23% of the 132 SDG targets with sufficient data coverage would be achieved by 2030. Target 9.1 (the only transport-relevant target that could be assessed in the region due to insufficient data) showed a positive trend but was unlikely to be achieved by 2030.

World Sustainable Transport Day

- The first annual World Sustainable Transport Day, as designated by UN General Assembly resolution A/RES/77/286, was celebrated on 26 November 2023.

United Nations Decade of Sustainable Transport 2026-2035

- The first-ever UN Decade of Sustainable Transport was declared in 2023 through UN General Assembly resolution A/78/148 and runs from 2026 to 2035. SLOCAT advocates for this UN Decade to serve as a global call to action, encouraging and supporting governments, businesses, users, financiers, civil society and academia to accelerate both individual and collaborative efforts in advancing sustainable transport.
- The UN Decade must foster inclusive, co-ordinated and transformative progress to strengthen transport systems and services that are socially inclusive, economically viable, environmentally responsible and resilient.

Context, challenges and opportunities

Expanding efficient, accessible, affordable, safe, sustainable, and resilient passenger and freight transport services is one of the most impactful actions to enable inclusive communities and shared prosperity on a liveable planet, while also advancing global climate, sustainability and resilience goals. Countries will need to accelerate transformation of the transport sector if they wish to achieve the objectives of key international agreements that aim for improved sustainability and resilience by 2030 and decarbonisation by 2050: the Paris Agreement on Climate Change, the 2030 Agenda for Sustainable Development and the Sendai Framework for Disaster Risk Reduction 2015-2030.

Varying mechanisms under these agreements provide countries with framework pathways for setting their transport ambitions, targets, and actions, and for learning from one other. Under the Paris Agreement, Parties to the United Nations Framework Convention on Climate Change (UNFCCC) (hereafter "countries") are required to submit Nationally Determined Contributions (NDCs) that outline targets and actions to reduce greenhouse gas emissions and adapt to climate change.[1] The year 2025 marks the beginning of a new five-year cycle for NDC submissions (the third cycle so far), with countries developing targets and actions up to 2035. The UNFCCC provides several additional mechanisms for countries to outline their ambitions and plans for climate change mitigation and adaptation – including Long-Term Low-Emission Development Strategies (LT-LEDS or LTS) and National Adaptation Plans (NAPs).[2]

NDCs, LT-LEDS and NAPs are central components for implementing the Paris Agreement's goal of limiting the average global temperature rise to well below 2 degrees Celsius (°C), with efforts to limit warming to 1.5°C.[3] NDCs allow countries to highlight where they need support through climate finance, technical assistance and capacity building. NAPs are a tool to identify, address and review adaptation priorities, actions and activities. To complement NDCs, the Paris Agreement invites (but does not require) countries to formulate and communicate LT-LEDS to help them establish low-carbon trajectories to 2050 and outline how they will achieve decarbonisation of their economies.[4]

Through the Marrakech Partnership for Global Climate Action, the Paris Agreement provides a mechanism for collaboration between national governments and non-Party stakeholders (such as cities, regions, businesses, investors, and civil society, including youth, Indigenous Peoples and local communities).[5] The main mission of the Marrakech Partnership is to strengthen collaboration among these actors to lower emissions and increase resilience against climate impacts, promoting higher ambition to collectively strive for the 1.5 °C temperature goal and a climate-neutral and resilient world.[6]

Countries use so-called Voluntary National Reviews (VNRs) to track their progress (in transport and other areas) towards achieving the UN Sustainable Development Goals (SDGs) under the 2030 Agenda for Sustainable Development.[7]

The Sendai Framework for Disaster Risk Reduction 2015-2030 is an agreement to raise a country's resilience against natural hazards and extreme weather events. The Sendai Framework has the ambition to prevent new and reduce existing disaster risk, increase preparedness for response and recovery, and strengthen resilience by 2030.[8] Progress on implementing the Sendai Framework is captured through its Global Assessment Report.[9]

Overall, countries are not on track to achieve these global agendas. Studies show that implementing the NDCs submitted as of October 2024 could still result in global warming of 2.1°C to 2.8°C by the end of the century, depending on underlying assumptions and major uncertainties.[10] Climate change threatens many infrastructure sectors, with transport facing the most severe potential impacts.[11] Moreover, as of 2025 only 18% of the 139 Sustainable Development Goal (SDG) targets with assessable data were on track to be achieved by the 2030 target year.[12]

Efforts to implement these global agendas – as well as climate, sustainability and resilience efforts in transport – are unfolding at a time of heightened geopolitical tension, domestic challenges in many countries, and increased scrutiny of public spending on climate and sustainability action. In 2024, more than 60 national elections were held worldwide, a record high, with several resulting in the rise of right-wing populist movements that have rolled back domestic climate and sustainability actions in transport.[13] Scepticism of climate science has grown, fuelled by misinformation, political polarisation and heightened resistance to transformative policy changes.

It remains critical to strengthen the linkages between national transport policies and the mechanisms for implementing and tracking progress on the Paris Agreement, the 2030 Agenda and the Sendai Framework. This can help assure that progress towards climate change mitigation and adaptation, as well as sustainability in transport, is anchored in and connected to efforts to achieve social inclusion, shared and resilient prosperity, and health and environmental protection.

National transport policies in support of sustainable, low-carbon transport

National transport policies form the backbone of efforts to transform the transport sector. Countries outline their commitments to transport development through national master plans, infrastructure development strategies and broader economic policy documents. However, not all transport measures support sustainability, resilience or climate action. Similarly, NDCs, LT-LEDS, NAPs and VNRs do not provide a complete picture of transport-related activities in a country.

Reviews of national policies versus NDCs in Asia-Pacific and Latin America and the Caribbean have shown that NDCs are often not aligned to national policies, and that climate-related actions in national transport policies are often not reflected in NDCs.[14] A 2024 review of 25 Asia-Pacific countries found that only 10% of the transport-related climate actions set in national policy documents were also featured in NDCs.[15] Even so, national transport strategies have given growing attention to climate action since the adoption of the Paris Agreement in 2015.[16]

The number of countries with dedicated national strategies for sustainable, zero-emission transport increased between 2023 and 2025. National transport decarbonisation strategies identified since 2023 include the following (see also Module 3. Regional Overviews for country policies by region):

- Brazil's Mobility and Innovation for the Automotive Sector (Mover) programme, launched in 2023, aims to accelerate the transition to low-emission vehicles and to improve the sustainability of domestic manufacturing.[17]
- Ecuador's National Sustainable Urban Mobility Policy 2023-2030 commits to ensuring that passenger and freight transport projects reduce their environmental impact and strive to cut emissions.[18]
- As of February 2024, Ethiopia became the first country in the world to ban imports of fossil fuel vehicles.[19] The country's draft national strategy for electric vehicles was approved in May 2025.[20]
- France's Ecological Plan of 2023 aims to reduce transport greenhouse gas emissions 32% below 2019 levels by 2030, based on 50 levers across different sectors (for transport, the measures focus on electrification, mode shift, car sharing, teleworking, and fuel efficiency, among others).[21]
- In 2023, Ghana launched a National Electric Vehicle Policy that commits to a 35% electric vehicle sales share by 2035 and no new sales or imports of diesel and petrol vehicles by 2045.[22]
- Mexico's 2024 National Strategy of Mobility and Road Safety outlines the transition to accessible, efficient, environmentally friendly and socially inclusive transport systems.[23] Also in 2024, Mexico adopted the National Public Collective Urban Transport Policy (PNTPCU), which aims to promote cleaner alternatives, reduce environmental impact, decrease car dependence, and improve accessibility, sustainability, safety and governance.[24]
- Spain released a Transport Decarbonisation Strategy in 2023, outlining tools and measures to achieve carbon neutrality by 2050 in the transport sector through the Avoid-Shift-Improve[i] framework.[25]
- Thailand's Thirteenth National Economic and Social Development Plan (2023-2027) aims to reduce transport-induced air pollution (particulate matter 2.5) and greenhouse gas emissions 4% annually by 2027.[26]
- In January 2023, the United States released its inter-agency National Blueprint for Transportation Decarbonization, a landmark strategy to drastically reduce transport greenhouse gas emissions towards net zero by 2050. The strategy outlines how to "deliver safe, effective, affordable, and sustainable solutions to existing and emerging challenges" and lays out targets and actions for 2030, 2040 and 2050.[27]
- In March 2025, Uruguay enacted the regulatory framework for its National Sustainable Urban Mobility Policy, which includes reforms to subsidies, taxes and other incentives to align the tax system with sustainable mobility objectives, and aims to advance regulations on energy efficiency and the safety of electric vehicles.[28]
- Viet Nam announced in 2024 a target for 30% of cars and 22% of motorbikes to be electric by 2030.[29] The country's National Programme for Transition to Electric Transport Vehicles outlines a strategic framework and mandates that all road vehicles use electricity or clean energy sources by 2050.[30]

i The Avoid-Shift-Improve framework has been central to sustainable, low-carbon transport for more than a decade. It follows an implicit hierarchy, with appropriate and context-sensitive "Avoid" measures (which avoid and reduce the need for motorised travel) intended to be implemented first, followed by "Shift" measures (which shift to more sustainable modes) and finally by "Improve" measures (which improve transport modes). See https://slocat.net/asi and H. Dalkmann and C. Brannigan (2007), Transport and Climate Change, Module 5e: Sustainable Transport – A Sourcebook for Policy-Makers in Developing Cities, GIZ GmbH, https://changing-transport.org/wp-content/uploads/2007_dalkmann_brannigan_transportandclimatechange.pdf.

Outcomes of the first Global Stocktake on the implementation of the Paris Agreement

In 2023, the UN Climate Change Conference in Dubai, United Arab Emirates (COP 28) concluded with a decision on the first Global Stocktake (GST) to scale up climate action by 2030 and extend efforts to 2035. The GST highlighted the urgency of decarbonising the transport sector, calling on countries to accelerate efforts towards "the reduction of emissions from road transport on a range of pathways, including through development of infrastructure and rapid deployment of zero- and low-emission vehicles".[31]

The GST underscores the need for integrated strategies that take into account transport demand management; proximity planning; shifts to less polluting transport modes; multi-modal infrastructure and services for public and collective transport, rail, walking, cycling, and freight transport and logistics; and technological innovation for cleaner, safer, more resilient and accessible transport systems. Such strategies are increasingly urgent as transport demand continues to grow and as hundreds of millions of people in low- and middle-income countries seek to gain access to transport services (and therefore to economic opportunities and to basic services such as health care and education). Globally, 1 billion people still lived more than 2 kilometres from an all-weather road as of 2019, and only half of the world's urban population had convenient access to public transport in 2022.[32]

Through the first GST, nearly every country in the world agreed (for the first time) to "transition away" from all fossil fuels to achieve net-zero greenhouse gas emissions.[33] **Other key actions of the first GST that are expected to greatly transform transport include tripling renewable energy capacity, doubling energy efficiency improvements and phasing out inefficient fossil fuel subsidies.**[34]

Such actions are critical given that fossil fuels continue to dominate global energy consumption in the transport sector. In 2023, renewable energy sources (including biofuels and renewable electricity) accounted for only 4.6% of transport energy demand, a share that has barely changed over the past decade.[35] Global energy use for transport grew 20.6% between 2010 and 2023, due to global economic growth, rising personal mobility rates in low- and middle-income economies, increased freight transport volumes, and the continued reliance on energy-intensive transport modes despite efficiency improvements in vehicle technologies.[36] Key steps forward include expanding energy-efficient transport modes and shifting towards widespread electrification.

Nationally Determined Contributions under the Paris Agreement

Under UNFCCC guidelines, countries must submit new or updated climate action plans (Nationally Determined Contributions or NDCs) every five years. Whereas the second generation of NDCs laid out activities until 2030, the third generation of NDCs – to be submitted in 2025 – is expected to strengthen the 2030 targets and actions and to lay out additional content and ambition towards 2035. To ensure progress, every new NDC must be more ambitious than the last. Strengthening NDCs is essential to achieve the goals of the Paris Agreement.

Most countries (95%) missed the initial deadline of 10 February 2025 for submitting third-generation NDCs to the UNFCCC.[37] **The UNFCCC later extended the deadline to September 2025 to give countries more time to outline their climate actions to 2035.**[38] (See Spotlight on Transport Ambition in NDCs 3.0.)

- **As of 1 August 2025, only 29 third-generation NDCs had been submitted to the UNFCCC.** (Note that SLOCAT considers any NDC submission since November 2024 to be a third-generation NDC, regardless of its official title or version number. For example, although Botswana's December 2024 NDC is titled "Second NDC", it was deemed a third-generation submission due to the submission date.[39])
- Niue and Somalia were the only low-income countries to submit a third-generation NDC as of 1 August 2025; additionally, 15 NDCs (51.7%) were from middle-income countries and 12 (41.4%) were from high-income countries.[40]
- The 29 NDC submissions were distributed across regions, with seven NDCs from Europe (24.2%), six from Africa (20.7%), six from Latin America and the Caribbean (20.7%), five from Asia (17.2%), three from Oceania (10.3%) and two from North America (6.9%).[41]

The third-generation NDCs submitted as of August 2025 continued the trend of an increasing share of mitigation targets for transport greenhouse gas emissions within each NDC generation.[42] However, due to the low number of overall submissions, it was difficult to identify trends in third-generation NDCs.

- In total, 34.5% of the third-generation NDCs (10 out of 29) featured mitigation targets for transport emissions; this was up from only 11% of first-generation NDCs (18 out of 169) and 19% of second-generation NDCs (28 out of 154).[43]

- Among the 10 NDCs with transport emission mitigation targets, 4 had unconditional targets[ii], 2 had conditional targets, 1 had a combination of conditional and unconditional targets, and 3 had unclear conditions (Table 1).[44] The target years were 2030 (three countries), 2035 (five countries) and 2050 (two countries).[45]
- Whereas Andorra's second-generation NDC targeted road transport, its third-generation submission refers to domestic transport.[46]
- Between its second- and third-generation NDCs, the United Arab Emirates upgraded its mitigation target from 14% below business-as-usual levels by 2030 to 20% below 2019 levels by 2035.[47]

So far, the third-generation NDCs have embraced a wider portfolio of transport emission mitigation actions but focused heavily on electrification; the 29 NDCs submitted as of August 2025 featured 7.9 transport emission mitigation actions each on average, up 36% from 5.8 actions each on average in the second-generation NDCs.[48]

- Mitigation actions in the third-generation NDCs targeted mainly mode shift and demand management (29.7%, 68 actions) and electrification (27.9%, 64 actions).[49] In contrast, only 6.1% (14) of the mitigation actions addressed domestic and international aviation and shipping, highlighting a gap also seen in second-generation NDCs.[50]
- Electrification continued to gain traction as a viable technological solution, with nearly half of the electrification actions that cited a specific transport mode having a focus on road transport vehicles (mainly bus fleets and passenger cars); however, half of all electrification actions did not explicitly mention a transport mode.[51]

TABLE 1. Mitigation targets for transport greenhouse gas emissions in third-generation NDCs, as of August 2025

Country	Targeted reductions in transport emissions	Type of target
Andorra	50% below business-as-usual levels in domestic transport emissions by 2030	Unclear conditionality
Belize	127 gigagrams of CO_2 equivalent less by 2030 and 312 of CO_2 equivalent less by 2035	Conditional
Botswana	429 gigagrams of CO_2 equivalent less by 2030 (of which 146.78 gigagrams are conditional)	Unconditional, conditional
Marshall Islands	40% below 2010 levels in domestic shipping emissions by 2030 and complete decarbonisation by 2050	Unclear conditionality
Nepal	1,426.22 gigagrams of CO_2 equivalent less by 2030 and 2,731.57 gigagrams of CO_2 equivalent less by 2035	Conditional
Republic of Moldova	52% below 1990 levels by 2030	Unconditional
Saint Lucia	22% below 2010 levels by 2035 in transport and energy	Unconditional
Somalia	33% below business-as-usual levels by 2035	Unclear conditionality
Switzerland	41% below 1990 levels by 2035, 57% by 2040 and 100% by 2050	Unconditional
United Arab Emirates	20% below 2019 levels by 2035, reaching 24.2 million tonnes of CO_2 equivalent	Unconditional

Source: See endnote 44 for this section.

ii When a target or action is indicated as unconditional in an NDC, a country can pursue it without international support. In contrast, conditional targets or actions require international, external support in the form of financial assistance, capacity building or technology transfer. (See Spotlight on Transport Ambition in NDCs 3.0 for detailed explanations of UNFCCC terms.)

As of August 2025, only two third-generation NDCs (Lesotho and Nepal) included targets for transport adaptation.[52] By comparison, six second-generation NDCs had transport adaptation targets (Antigua and Barbuda, Burundi, Cambodia, Kenya, Liberia and Papua New Guinea), although Kenya was the only one of these countries to later submit a third-generation NDC (as of mid-2025).[53] Adaptation targets relate to climate-proof infrastructure as well as the deployment of public transport, walking and cycling to support more robust and resilient transport systems.[54]

- Lesotho's NDC sets a target to strengthen standards to climate-proof roads and critical public infrastructure, with 10 climate-proof codes to be revised by 2025.[55]
- In its NDC, Nepal aims to embed climate-resilient planning for transport infrastructure projects in revised regulations and to equip all major highways with early warning systems by 2030.[56]

A parallel assessment of 22 third-generation NDCs as of June 2025 found that the featured commitments would result in greenhouse gas emissions of 51.1 gigatonnes of CO_2 equivalent by 2035 (around 36% from transport if accounting for the current NDC submissions).[57] Although this represents a reduction of 1.4 gigatonnes of CO_2 equivalent compared to 2030 levels, it is still well above the emission levels required to limit warming to 2°C (36 gigatonnes) or 1.5°C (25 gigatonnes) by 2035.[58]

The second generation of NDCs, completed in 2024, comprised 154 submissions (153 countries plus the 27-member European Union, EU), enabling a complete picture of countries' transport climate actions to 2030.[59] These NDCs featured major improvements in target setting for transport greenhouse gas emission mitigation as well as other transport targets. Second-generation NDCs also initiated the greater focus on electrification and the stronger role for transport adaptation.[60]

Studies from October 2024 found that the commitments in second-generation NDCs were insufficient to meet the Paris Agreement target of keeping global warming to 2°C and were still far from achieving the 1.5°C limit.[61] The ambitions in second-generation NDCs would still result in global warming of 2.1°C to 2.8°C by the end of the century, depending on underlying assumptions and major uncertainties.[62] Even if all NDC commitments were implemented, the carbon budget to stay within 1.5°C would be used up by 2032.[63] The 2024 UNFCCC NDC Synthesis Report noted a large gap between the ambition levels of second-generation NDCs (considering both unconditional and conditional targets) and required emission reductions. For 2030, the gap totalled 11.3 gigatonnes of CO_2 equivalent to meet the 2°C scenario and 19.2 gigatonnes of CO_2 equivalent to meet the 1.5°C scenario.[64]

Long-Term Low Emission Development Strategies under the Paris Agreement

As of August 2025, 78 LT-LEDS had been submitted to the UNFCCC; however, only 3 were from low-income countries (Burkina Faso, Ethiopia and Gambia), indicating an ongoing gap among countries in laying out their long-term climate ambitions.[65]

- The majority of LT-LEDS submissions (38%) were from European countries, which included submissions from the EU overall and from 19 individual EU Member States.[66]
- Of the 78 total submissions, 38 were from middle-income countries and 36 were from high-income countries, together comprising 95% of submissions.[67]

A total of 21 LT-LEDS (27%) were submitted in 2023 and 2024, with 4 more (Burkina Faso, Equatorial Guinea, Lebanon and Peru) submitted in 2025 (as of August).[68] All of the LT-LEDS submitted between 2023 and August 2025 featured transport actions.

- Eleven countries submitted their first LT-LEDS in 2023: Belize, Bhutan, Bosnia and Herzegovina, Cyprus, Ethiopia, Georgia, Ireland (updated in 2024), Oman, Solomon Islands, Sri Lanka (updated in 2024) and Vanuatu.[69]
- Seven countries submitted LT-LEDS in 2024: Armenia, Equatorial Guinea, Kazakhstan, Panama, Serbia, Türkiye and the United Arab Emirates.[70]
- Although no formal update process exists for LT-LEDS under the UNFCCC, four countries submitted updated strategies or status updates in 2023 and 2024: Australia, Ireland, Nigeria and Sri Lanka.[71]
- In 2025, Burkina Faso, Lebanon and Peru submitted their first LT-LEDS, and Equatorial Guinea updated its LT-LEDS from 2024; Switzerland added its third-generation NDC as a supplement to its LT-LEDS.[72]

Among the 78 LT-LEDS submitted as of August 2025, 23 (30%) outlined transport greenhouse gas mitigation targets (Table 2)**.[73] New LT-LEDS with transport emission targets were from Armenia, Belize, Burkina Faso, Ireland, Nigeria, Oman, Peru, Serbia, Solomon Islands, the United Arab Emirates and Vanuatu.[74]** In their LT-LEDS submissions, Belize, Ireland, Oman and the United Arab Emirates commit to achieving carbon neutrality or net zero transport greenhouse gas emissions by 2050.[75]

Only 19 of the 78 LT-LEDS as of August 2025 (24%) featured transport adaptation actions, including 9 LT-LEDS submitted between 2023 and August 2025.[76] Most countries continued to disregard synergies between decarbonisation and adaptation. In contrast, 55% of the third-generation NDCs

TABLE 2. LT-LEDS transport targets submitted by countries as of August 2025

LT-LEDS	Targeted reductions in CO_2-equivalent transport emissions
Armenia	4,492 gigagrams (or 2,769 gigagrams in a high-ambition scenario) annually by 2050
Australia	Net zero by 2050
Belgium	Zero emissions for passenger and freight transport by 2050
Belize	Carbon neutrality (95% below 2050 business as usual)
Burkina Faso	41.1% below 2050 business as usual
The Gambia	From 1,026 gigagrams in 2020 to 315 gigagrams in 2050
Germany	40-42% below 1990 levels by 2030 (reductions of around 95-98 million tonnes)
Ireland	6 million tonnes of CO_2 equivalent annually by 2030 (50% below 2018 levels); carbon neutral by 2050
Lithuania	At least 14% below 2005 levels by 2030; 90% by 2050
New Zealand	Net zero by 2050
Nigeria	Limit growth to 224 million tonnes of CO_2 equivalent (gas economy scenario) or 107 million tonnes of CO_2 equivalent (renewable energy scenario) by 2060
Oman	3% below 2021 levels by 2030; 34% by 2040; 100% by 2050
Peru	41% for land freight transport and 11% for rail transport below 2019 baseline by 2050*
Portugal	43-46% below 2005 levels by 2030; 84-85% by 2040; 98% by 2050
Serbia	Limit emission growth to 10% to 2030; reduce emissions 30-54% by 2050 (range of 4,731-3,091 kilotonnes of CO_2 equivalent)
Slovenia	90-99% below 2005 levels by 2050
Solomon Islands	40% of domestic shipping emissions by 2030; 100% by 2050
Spain	30% below business as usual by 2030
Sweden	70% below 2010 levels by 2030 (excluding domestic aviation)
Switzerland	Zero domestic land transport emissions by 2050 (with few exceptions); net zero international aviation emissions by 2050
United Arab Emirates	1% below 2019 levels by 2030 (42 million tonnes of CO_2 equivalent); 40% by 2040 (25 million tonnes of CO_2 equivalent); 100% by 2050 (zero emissions)
United Kingdom	Net zero domestic aviation and shipping emissions by 2050
Vanuatu	50% below business as usual by 2050

*** The sub-sectoral target in Peru's LT-LEDS lacks clarity and is subject to error.**

Source: See endnote 73 for this section.

submitted as of August 2025 and 42% of all second-generation NDCs featured transport adaptation.[77]

- Nigeria's updated 2024 LT-LEDS contains a comprehensive set of adaptation measures, including the provision of several transport options to strengthen the system, and goals to improve public and private investments in climate-proofed and resilient transport infrastructure.[78]
- Türkiye's 2024 LT-LEDS outlines detailed transport adaptation and infrastructure resilience actions. They include implementing design and technical engineering approaches to enhance the preparedness and resilience of critical infrastructure; ensuring flood protection for railways and maritime transport; establishing early warning systems by installing weather sensors along major transport routes; and using dedicated bus lanes in cities for emergency services.[79]

The ambition levels in countries' LT-LEDS are not sufficient to meet all global warming goals under the Paris Agreement. An assessment of the 68 LT-LEDS submissions as of 25 September 2023 found that even if all of the actions were fully implemented and delivered on time, the greenhouse gas emissions from submitting countries would fall only 63% below 2019 levels by 2050.[80] Overall, a lack of clarity remains regarding the scope and coverage of long-term goals outlined in LT-LEDS.

A key shortcoming of NDCs and LT-LEDS is the delayed timing of emission reductions: as of 2023, two-thirds of the planned reductions were for the period 2030-2050, making it impossible to remain within the 1.5°C global warming limit as the carbon budget to stay within 1.5°C would be used up by 2032.[81] The combined ambition from LT-LEDS and long-term targets in NDCs would result in estimated economy-wide per capita greenhouse gas emissions of 2.3 tonnes of CO_2 equivalent by 2050.[82] While this is consistent with scenarios limiting warming to below 2°C (with 67% probability), it exceeds the level compatible with the 1.5°C limit (1.3 tonnes per person by 2050).[83]

Commitments and initiatives at recent United Nations climate conferences

The 2021 UN Climate Change Conference in Glasgow, United Kingdom (COP 26) kicked off an unprecedented number of commitments and initiatives on sustainable, low-carbon transport.[84] These efforts support countries' climate ambitions through non-binding actions and agreements. Transport initiatives included the Breakthrough Agenda on Transport, the Clydebank Declaration for Green Shipping Corridors, the Global Memorandum of Understanding on Zero-Emission Medium- and Heavy-Duty Vehicles (Global MOU), the International Aviation Climate Ambition Coalition and the Zero Emission Vehicles Declaration (which later became the Accelerating to Zero Coalition at COP 27).[85]

These efforts have continued to develop and grow, with every subsequent UN Climate Change Conference adding new initiatives or multilateral agreements. A comprehensive review of transport initiatives launched at UN climate conference events identified 19 such initiatives as of December 2024.[86] Key developments in 2023 and 2024 included the following:

- **In the lead-up to the 2023 UN Climate Change Conference in Dubai, United Arab Emirates (COP 28), a group of organisations launched a call to double the share of energy-efficient and fossil-free forms of land transport by 2030, with the goal of fossil-free land transport by 2050.**[87] **The call to action attracted more than 60 multi-stakeholder signatories (including Chile and Colombia) and emphasised shifts towards public transport, walking, cycling, and rail freight, as well as electric vehicles and railways, while drastically scaling up the use of renewable and zero-emission energy sources.**[88] While each country will adopt a nationally determined approach, the call outlines a series of universal enablers to meet this target. The call to action was issued by SLOCAT and REN21, jointly with the Institute for Sustainable Development and International Relations (IDDRI), the Institute for Transportation and Development Policy (ITDP), the International Union of Railways (UIC), the International Association of Public Transport (UITP) and the World Resources Institute (WRI).

- **Building on the call to action and other multi-stakeholder efforts, the Climate Champions Team launched the Avoid and Shift Breakthrough at the 2024 UN Climate Change Conference in Baku, Azerbaijan (COP 29).**[89] The Breakthrough features the same doubling goal for land transport and seeks to strengthen transport

targets that focus on "Avoid" and "Shift" measures in complementarity with other initiatives that favour "Improve" measures.[90]

- **Since COP 28, Colombia, Costa Rica and Nigeria have signed the ZEV Declaration of the Accelerating to Zero Coalition (A2Z)**, which aims for all sales of new cars and vans to be zero emission globally by 2040 and in leading markets by 2035.[91]
- **During 2023 and 2024, five new countries – Cabo Verde, Ethiopia, Ghana, Mozambique and Seychelles – joined the Global MOU, committing to 30% sales of zero-emission new trucks and buses by 2030 and 100% by 2040.**[92]
- **Transport initiatives launched during COP 28 included: the Alliance for Cycling and Walking Towards International Vitality (ACTIVE), the Call to Action for Transformative Urban Planning / 15MC (15-minute cities), Cargo Owners for Zero Emission Vessels (coZEV), the Coalition for High Ambition Multilevel Partnerships (CHAMP), the Future is Public Transport Coalition and the Green Maritime Africa Coalition (GMAC).**[93]

At COP 28, the UN Climate Change High-Level Champions and the Marrakech Partnership for Global Climate Action released the 2030 Climate Solutions, which laid out near-term milestones and actions for various sectors (including transport) and enablers (finance, technology, planning and capacity building).[94] Targets from previous initiatives as well as the Breakthrough Agenda were compiled through this process (Table 3).[95]

TABLE 3. 2030 Climate Solutions for Transport

Transport area	2030 targets	Reference
Road transport (passenger vehicles and vans)	Zero-emission vehicles (ZEV) are the new normal – accessible, affordable and sustainable in all regions by 2030. ZEVs make up 100% of all global passenger vehicles and vans sales by 2030 (in key markets).	Breakthrough Agenda 2030 Breakthroughs
Road transport (buses and heavy-duty vehicles)	ZEVs are the new normal – accessible, affordable and sustainable in all regions by 2030. Battery electric vehicles (and fuel cell electric vehicles) make up 60% of global bus sales and 35-40% of global heavy goods vehicle sales by 2030.	Breakthrough Agenda 2030 Breakthroughs
Resilient transport	Transport infrastructure is resilient to climate hazards through the adoption of new technology, design and materials.	Sharm El Sheikh Adaptation Agenda
Green shipping	Zero-emission fuels make up at least 5% (aiming for 10%) of international shipping fuels and 15% of domestic shipping fuels by 2030.	2030 Breakthroughs
Resilient shipping	450,000 seafarers receive upskilling and retraining by 2030. 30% of trade moves through climate-adapting ports by 2030.	2030 Breakthroughs
Aviation	Sustainable aviation fuels (SAF) make up 13-15% of fuels globally by 2030.	2030 Breakthroughs
Avoid and shift	Double the share of energy-efficient and fossil-free land transport for people and goods, with a focus on shifts to public transport, walking, cycling, and rail freight, as well as electric vehicles and railways.	2030 Breakthroughs
Transport accessibility and affordability	Target still being developed.	Sharm El Sheikh Adaptation Agenda 2030 Breakthroughs

Source: See endnote 95 for this section.

National Adaptation Plans under the UNFCCC

National Adaptation Plans (NAPs) were initially developed as a tool for least developed and developing countries to identify, address and review their priorities, actions and activities on climate change adaptation.[96] **Burkina Faso and Cameroon submitted the first NAPs to the UNFCCC in October 2015, and since 2023 high-income countries have also been invited to submit NAPs.**[97] The NAP process predates the Paris Agreement, having been established at the 2010 UN Climate Change Conference in Cancun, Mexico (COP 16).[98] (See Spotlight on Transport in NAPs.)

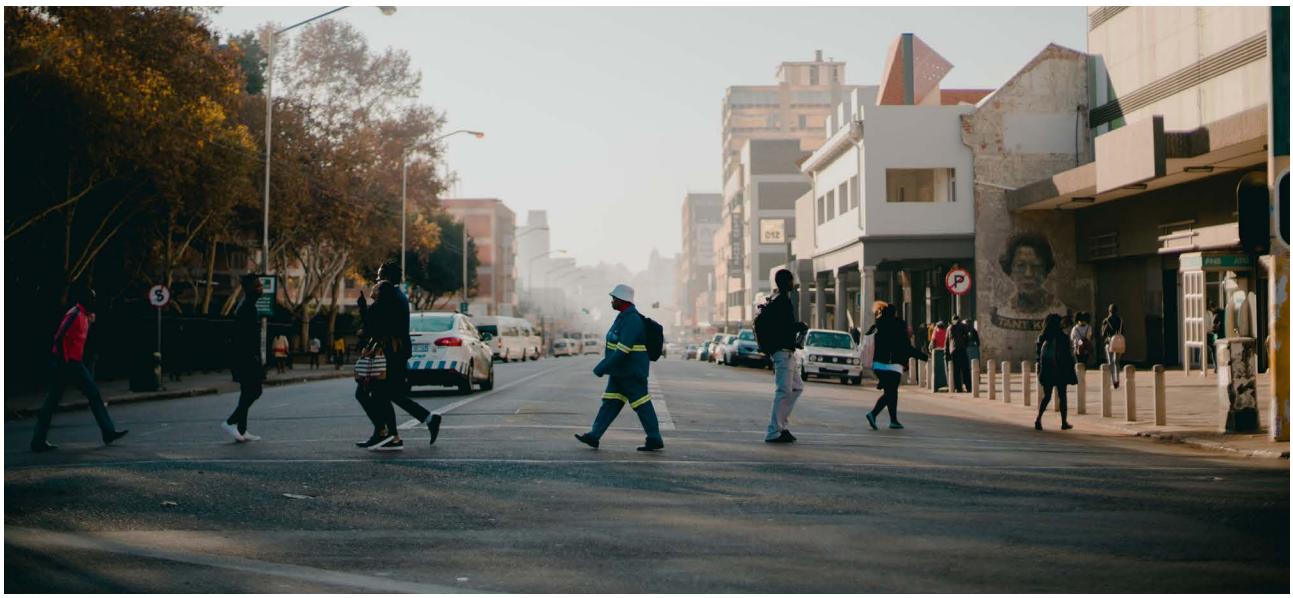
Unlike NDCs, which are time-bound, NAPs offer greater flexibility in setting out adaptation strategies, including in the transport sector, which is highly vulnerable to climate impacts. As of 2019, natural hazards caused around USD 15 billion in direct damages to transport systems annually, mainly in lower-income economies. (See 1.4 Building Adaptation and Resilience Within Transport Systems and Across Communities and Economies.)

As of 1 August 2025, a total of 74 countries had submitted NAPs, of which 58 (78%) were from low- and middle-income countries.[99] **The number of NAPs increased significantly between 2023 and August 2025, with nearly half (48%) of submissions occurring during this period (35 total, including 23 in 2023 and 2024 and 12 in 2025).**[100] With the exceptions of Burkina Faso and Uruguay, all were first-time NAP submissions, meaning that one in three NAPs was submitted in this three-year period.

- Submissions from low- and middle-income countries in 2025 came from Burkina Faso, Jordan and Mongolia.[101]
- New submissions from high-income countries between January and 1 August of 2025 included Antigua and Barbuda, Austria, Finland, Germany, Ireland, Israel, the Netherlands, the United Kingdom and the United States.[102]

Transport features prominently in many NAPs, with countries outlining activities for enhanced infrastructure resilience and transport system adaptation, as seen in examples from 2023 to mid-2025**.**

- In Africa, Burkina Faso and Burundi are investing in climate-resilient infrastructure and road network maintenance, and Mozambique and Morocco are integrating risk assessments and resilience planning into national strategies.[103]
- In Asia, Bhutan and the Philippines have laid out detailed transport-related actions, including climate-resilient road development and the integration of climate risk into infrastructure planning.[104]
- Moldova and Serbia in Europe have developed comprehensive approaches that include updated technical standards, climate-proofing of transport assets and institutional reforms.[105]
- In Latin America and the Caribbean, Argentina and Haiti are enhancing infrastructure resilience and promoting low-emission, adaptive transport systems.[106]
- North American submissions highlight transport-specific risks such as melting ice roads in Canada and systemic resilience strategies in the United States.[107]
- In Oceania, NAPs from New Zealand and Papua New Guinea focus on embedding resilience into land transport systems and updating infrastructure codes.[108]



Sendai Framework for Disaster Risk Reduction 2015-2030

The Sendai Framework for Disaster Risk Reduction 2015-2030 is an agreement to raise a country's resilience against natural hazards and extreme weather events. It aims to prevent new and reduce existing disaster risk, increase preparedness for response and recovery, and strengthen overall resilience.[109]

A 2023 mid-term review of the Sendai Framework noted the high unlikelihood of achieving the framework's goals by 2030, given trends in disaster risk reduction and limited progress in achieving other global agreements (such as the 2030 Agenda, the Paris Agreement and the Global Biodiversity Framework)**.**[110] **As of October 2024, a total of 163 countries had reported on the global targets through the Sendai Framework Monitor** (Box 1)**; 81 countries had reported on all seven targets, and 107 countries had reported on all targets related to the UN Sustainable Development Goals (SDGs).**[111] **None of these assessments highlighted specific insights on transport systems and infrastructure.**

Box 1. Global targets of the Sendai Framework for Disaster Risk Reduction 2015-2030

Target A: Substantially reduce global disaster mortality by 2030, aiming to lower the average per 100,000 people for 2020-2030 compared to 2005-2015.

Target B: Substantially reduce the number of affected people globally by 2030, aiming to lower the average global figure per 100,000 people for 2020-2030 compared to 2005-2015.

Target C: Reduce direct disaster economic loss in relation to global gross domestic product (GDP) by 2030.

Target D: Substantially reduce disaster damage to critical infrastructure and disruption of basic services, among them health and educational facilities, including through developing their resilience by 2030.

Target E: Substantially increase the number of countries with national and local disaster risk reduction strategies by 2020.

Target F: Substantially enhance international co-operation to developing countries through adequate and sustainable support to complement their national actions for implementation of this framework by 2030.

Target G: Substantially increase the availability of and access to multi-hazard early warning systems and disaster risk information and assessments to people by 2030.

Source: See endnote 111 for this section.

In June 2025, at the eighth session of the Global Platform for Disaster Risk Reduction (the first session since the mid-term review), participants highlighted that global mortality has halved over the past 25 years and that reporting on national and local disaster risk reduction strategies has doubled.[112] The session concluded with the Geneva Call for Disaster Risk Reduction, asking for more concrete actions in the next five years to sustain progress and to achieve the Sendai Framework 2030.[113]

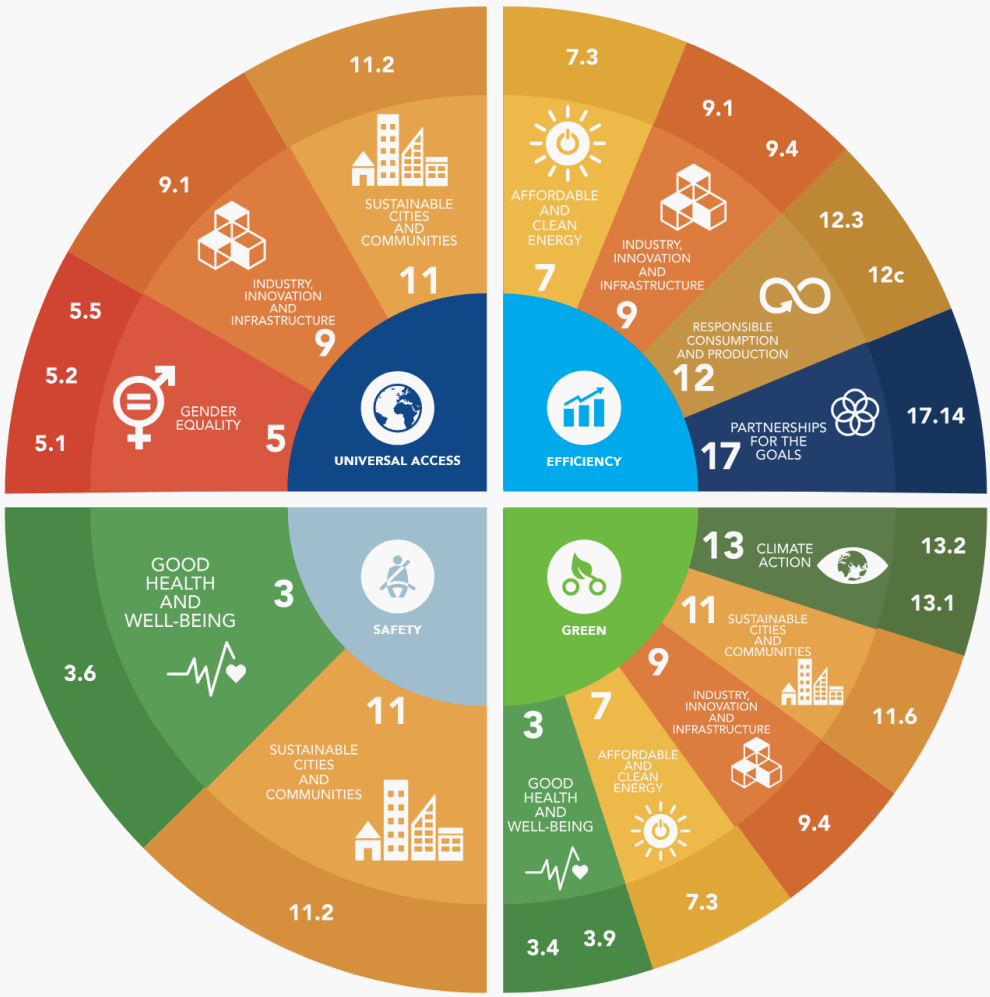
Voluntary National Reviews under the 2030 Agenda for Sustainable Development

The UN 2030 Agenda for Sustainable Development is a cross-cutting, interconnected agenda, wherein the achievement of one of the 17 Sustainable Development Goals is often dependent on the achievement of others. Although no stand-alone SDG is focused on sustainable, low-carbon mobility, the successful implementation of efficient, accessible, affordable, safe, sustainable, and resilient passenger and freight transport services supports the achievement of almost every SDG.[114] Out of the 169 SDG targets, only 3 relate directly to transport (target 3.6 on road safety, target 9.1 on access to all-weather roads and target 11.2 on public transport access); however, another 15 targets relate indirectly to transport, and adequate transport action can contribute to their achievement .[115]

As of 2025, effectively every country involved in the SDG process had submitted a Voluntary National Review (VNR) and in some cases multiple VNRs. The 2030 Agenda encourages UN Member States to submit VNRs to the annual UN High-Level Political Forum on Sustainable Development. The VNR process facilitates sharing of successes and challenges, with a view towards accelerating implementation of the 2030 Agenda. Overall, more than 406 VNRs had been submitted by 190 countries and the EU as of 2025, including 39 in 2023, 36 in 2024 and 37 in 2025.[116] A total of 152 countries had reported twice or more times on their sustainable actions in support of the 2030 Agenda.[117]

Since the first High-Level Political Forum in 2016, countries have reported on transport as a vital sector to implement the SDGs, showcasing on-the-ground implementation and best practices. VNRs from the period 2016-2022 (during which SLOCAT conducted annual assessments of VNRs) **revealed consensus on transport's role as a key contributor to SDG implementation.**[118] This role was consistent throughout the years, with only minor deviations depending on which SDG was the focus of the High-Level Political Forum in a particular year.

FIGURE 1. Relevant SDG targets for transport



Source: See endnote 115 for this section.

- More than 90% of the VNR submissions highlighted progress in the transport sector, indicating that transport was well featured in countries' sustainability activities across all regions and income groups.[119]
- Around a fifth of VNRs between 2016 and 2022 reported specific targets to advance sustainable transport, with the majority of targets aimed at the short to medium terms (2020 and 2030).[120] Targets were focused on electrification, freight, road safety, and renewable energy, among others.[121]
- Palau's 2024 VNR outlined challenges in reducing dependency on private motor vehicles. In 2024, the country launched an initiative to introduce electrified public transport and to encourage walking and cycling.[122]
- Rwanda's 2023 VNR commits to establishing inclusive transport infrastructure, including increasing the share of the population with access to all-weather roads and convenient public transport. As rural roads have been paved, urban roads have been upgraded with considerations for walking, cycling and the mobility needs of persons with disabilities.[123]
- The 2023 VNR by Uzbekistan highlights transport activities related to SDG 9 (Industry, Innovation and Infrastructure) and SDG 11 (Sustainable Cities and Communities). The country intends to improve inter-city travel, increase the share of electrified railway to 60%, expand public transport (networks, facilities and services) and increase cross-country freight performance.[124]

Benchmarking progress on SDGs, globally and regionally

As of mid-2025, only 18% of the SDG targets that had sufficient data coverage (139 out of 169 total targets) were on track to be achieved by 2030; a further 17% showed moderate progress, 31% showed marginal progress, 17% had stagnated, and 18% had regressed below the 2015 baseline.[125] **Of the SDG targets with sufficient data coverage and most relevant to transport, target 3.6 on reducing road traffic crashes and target 9.1 on access to all-weather roads recorded marginal progress, indicating that significant acceleration is needed. Although the UN data to assess progress on target 11.2 (access to public transport systems) are insufficient, other data show that 52% of the urban population on average had convenient access to public transport during 2020-2022** (see Module 3 Regional Overviews and 4.5 Public Transport).[126]

- **In Africa, analysis from 2023 found that both target 3.6 and target 9.1 had regressed in the region.**[127] **Overall, Africa had made progress on 13 of the 17 SDGs but was lagging on 4 key goals: SDG 7 (Affordable and Clean Energy), SDG 8 (Decent Work and Economic Growth), SDG 11 (Sustainable Cities and Communities) and SDG 13 (Climate Action).**[128] **Of the 115 SDG targets with sufficient data coverage, only 4 showed moderate progress.**[129]
- **In the Asia-Pacific region, all SDGs except SDG 13 (Climate Action) recorded progress as of 2024, although at the current pace the region would not achieve all SDGs before 2062.**[130] **A benchmarking of the transport sector in Asia-Pacific against other regions, based on 20 SDG-related indicators, found that Asia-Pacific performed better in nine indicators** (transport energy intensity, road transport nitrogen oxide emissions, road fatalities, multi-hazard exposure, railway infrastructure, road infrastructure, gross value-added by transport, growth in renewable energy and access to all-weather roads for the rural population). Other regions outperformed Asia-Pacific in indicators such as power grid carbon intensity, air pollution, energy consumption, bus imports, transport employment, access to public transport, removal of fossil fuel subsidies and imports of electric vehicles.[131]
- **For Latin America and the Caribbean, a 2024 study projected that only 23% of the 132 SDG targets with sufficient data coverage would be achieved by 2030.**[132] **Target 9.1 (the only transport-relevant target that could be assessed in the region due to insufficient data) showed a positive trend but was unlikely to be achieved by 2030.**[133] Overall, 64% of the targets indicated positive trends, while 41% of target-related measures required accelerated progress.[134]

World Sustainable Transport Day

The first annual World Sustainable Transport Day, as designated by UN General Assembly resolution A/RES/77/286, was celebrated on 26 November 2023. The event recognises the "important role of safe, affordable, accessible and sustainable transport systems for all in supporting sustainable economic growth, improving the social welfare of people and enhancing international cooperation and trade among countries".[135]

United Nations Decade of Sustainable Transport 2026-2035

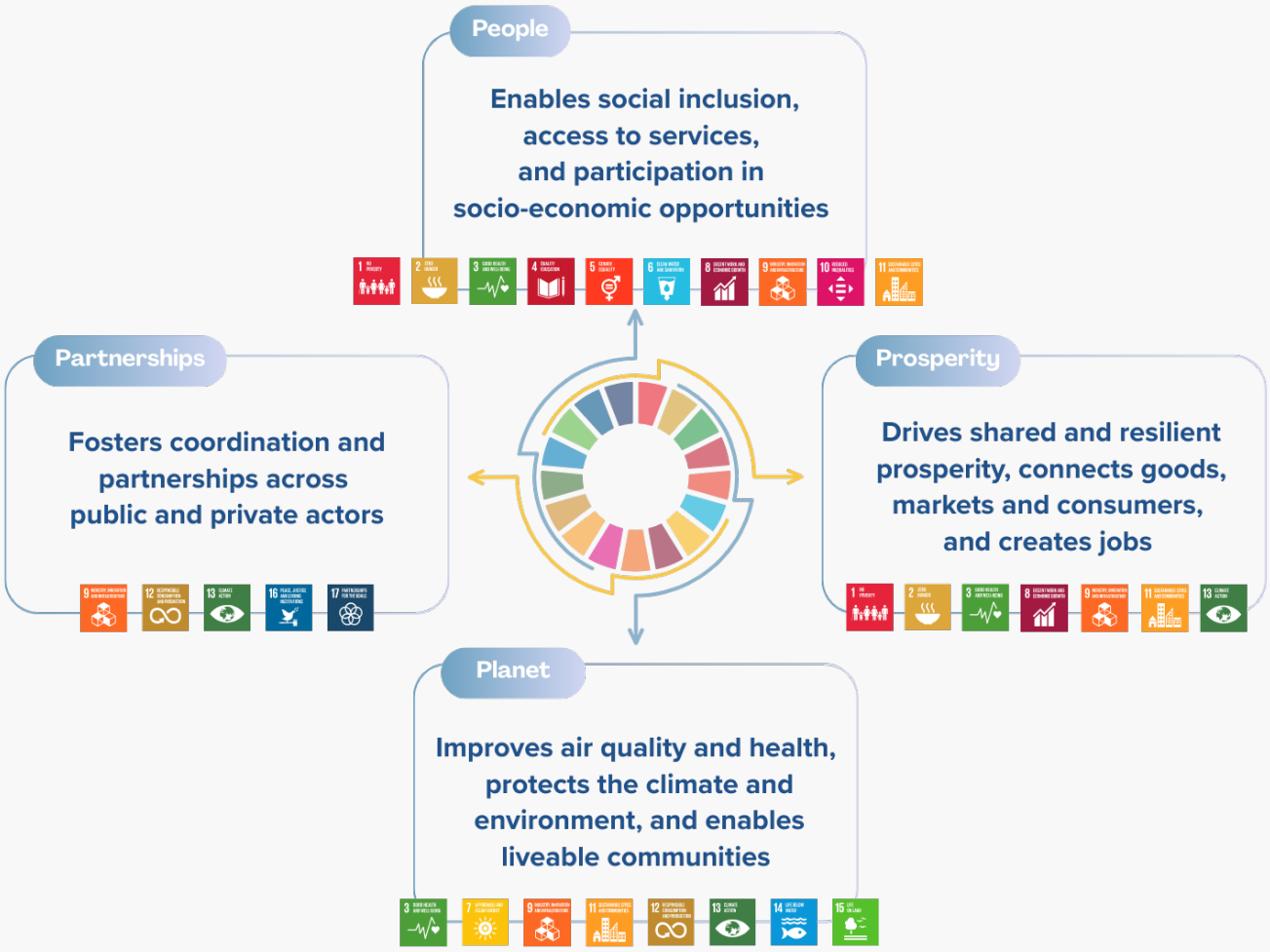
The first-ever UN Decade of Sustainable Transport was declared in 2023 through UN General Assembly resolution A/78/148 and runs from 2026 to 2035. SLOCAT advocates for this UN Decade to serve as a global call to action, encouraging and supporting governments, businesses, users, financiers, civil society and academia to accelerate both individual and collaborative efforts in advancing sustainable transport. The UN Decade must foster inclusive, co-ordinated and transformative progress to strengthen transport systems and services that are socially inclusive, economically viable, environmentally responsible and resilient (Figures 2 and 3).[136]

FIGURE 2. What can the UN Decade of Sustainable Transport achieve by 2035?

1. All actors are aligned behind a forward-looking vision, working together to deliver context-specific action
2. National and sub-national governments and businesses have policymaking, organisational, and technical capacities and skills to develop and implement integrated frameworks, particularly in low- and middle-income countries (LMICs)
3. Public and private investments, and revenue streams from transport users are used to fund sustainable transport expansion, particularly in LMICs
4. Reliable, open-access data informs evidence-based policy, investment, evaluation and improvement
5. Strengthened mechanisms across actors and transport modes, between transport and other sectors, and among UN entities are enabling systemic coordination and international multi-stakeholder cooperation

Source: See endnote 136 for this section.

FIGURE 3. Sustainable transport is the lifeline of thriving communities and economies



Source: See endnote 136 for this section.

The UN Department of Economic and Social Affairs, in collaboration with UN Regional Commissions, is tasked with preparing an Implementation Plan for the UN Decade, in consultation with "Member States, specialised agencies, funds, programmes and bodies of the United Nations, as well as other intergovernmental organisations, non-governmental organisations and relevant stakeholders".[137] The UN General Assembly resolution also recognises "the need for continued cooperation and coordination between the United Nations and existing partnerships on sustainable transport issues such as (...) SLOCAT", among others.[138]

Building on the 2024 paper *Inputs to the UN Process,* released in collaboration with the UK-funded High Volume Transport Applied Research Programme, SLOCAT published a paper in May 2025 outlining what the UN Decade of Sustainable Transport can achieve, as well as priority areas and critical levers of change for the coming decade.[139] The paper is intended to support the ongoing work on the UN Implementation Plan for the UN Decade and is informed by discussions from an April 2025 workshop co-organised by SLOCAT, the UK Foreign, Commonwealth and Development Office, and Canada's International Development Research Centre, in collaboration with the FIA Foundation, Kühne Climate Center and WRI. The workshop brought together participants from diverse professional backgrounds, geographies, and transport development contexts, and contributed thought leadership and stakeholder engagement in preparations towards the UN Decade of Sustainable Transport.[140]

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SPOTLIGHT

3.0

Transport Ambition in NDCs 3.0

KEY FINDINGS

- As of August 2025, a total of 29 third-generation NDCs had been submitted to the United Nations Framework Convention on Climate Change (UNFCCC). The submissions were distributed equally across regions when considering the relative number of countries per region. Niue and Somalia were the only low-income countries with a third-generation NDC. NDCs from low- and middle-income countries are important because future transport demand growth is projected to occur mainly in these country income groups.

- The countries that submitted third-generation NDCs as of August 2025 contributed 20.3% of the world's economy-wide greenhouse gas emissions and 36.1% of global transport emissions in 2023 (excluding international aviation and shipping). This high share of transport emissions was driven by major emitters such as Brazil, Canada, Japan, the United Kingdom and the United States.

- Progress has been made in transport target-setting over the three generations of NDCs. Of the third-generation NDCs submitted as of August 2025, 34.5% (10 in total) featured explicit targets for mitigating transport greenhouse gas emissions; this was up from only 11% (18 total) of first-generation NDCs and 19% (28 total) of second-generation NDCs.

- In total, 32 non-greenhouse gas transport targets were included in third-generation NDCs as of August 2025. As with second-generation NDCs, the most common type of non-greenhouse gas transport target was for zero-emission vehicles, accounting for 44% of the total.

- The third-generation NDCs as of August 2025 embraced a wider portfolio of actions for reducing transport emissions than did previous generations, although a strong focus on electrification persisted.

- The full potential of a balanced Avoid-Shift-Improve (A-S-I) framework for mitigating transport emissions remains untapped, as 66% of the transport mitigation actions in third-generation NDCs as of August 2025 focused on "Improve" actions.

- Despite freight transport's large contribution to both transport and overall greenhouse gas emissions, the sector remained overlooked in NDCs, with few of the third-generation NDCs as of August 2025 featuring activities to mitigate these emissions. Freight activity is projected to more than double from 2020 to 2050, bringing rapidly rising emissions from freight transport. The increase in climate-induced disasters threatens global supply chains and freight operations, making it crucial to boost resilience efforts in freight transport and to adapt to changing environments. In a major gap, no third-generation NDCs as of August 2025 included freight transport adaptation actions.

- Only seven of the third-generation NDCs (Belize, Canada, the Marshall Islands, Monaco, Niue, the United Kingdom and the United States) as of August 2025 included specific actions to mitigate emissions from domestic and international aviation and/or shipping. Aviation contributed 14% of global transport greenhouse gas emissions in 2023, while maritime transport was responsible for 8%. In many countries, the growth in aviation-related emissions has outpaced overall emission

KEY FINDINGS

reductions. Decarbonising maritime transport is also seen as crucial, but progress is slow.

- The scope of third-generation NDCs has widened to cover sustainability topics such as a just transition, air quality and public health. Lesotho and the United Kingdom have used third-generation NDCs to reinforce linkages between their climate and broader sustainability commitments.
- Most of the transport actions in third-generation NDCs as of August 2025 did not mention specific transport modes. Where modes were mentioned, the focus was largely on road vehicles. Transport adaptation actions in particular have missed the opportunity to refer to specific modes.
- Only two of the third-generation NDCs as of August 2025 featured transport adaptation targets, both of them from least developed countries (Lesotho and Nepal).
- NDC content on adaptation can draw on NAPs to strengthen the vital connections between mitigation and adaptation efforts, supporting inclusive, low-carbon and resilient connectivity and economic growth. Adaptation and mitigation efforts are mutually reinforcing, as adaptation helps to cope with the unavoidable effects and creates the resilient foundation for mitigation action and sustainable development.
- Sixteen of the third-generation NDCs (55% of the total) as of August 2025 contained transport adaptation actions, an improvement from the 42% of second-generation NDCs with such actions. As with earlier NDCs, the transport adaptation actions in third-generation NDCs had a strong focus on structural and technical actions, followed by institutional and regulatory actions.
- Although it is too early to assess the collective impact of the 29 third-generation NDCs submitted as of 1 August 2025, initial reviews suggest that the ambition remains insufficient to meet the Paris Agreement goal of limiting global warming to 1.5°C. A parallel assessment of 22 third-generation NDCs as of June 2025 found that the new commitments would result in greenhouse gas emissions of 51.1 gigatonnes of CO_2 equivalent by 2035 (around 36% from transport, if accounting for the current NDC submissions). Although this represents a reduction of 1.4 gigatonnes of CO_2 equivalent compared to 2030 levels, it is still well above the emission levels required to limit warming to 2°C (36 gigatonnes) or 1.5°C (25 gigatonnes) by 2035.
- Studies based on NDC submissions as of October 2024 showed that the commitments made in second-generation NDCs were also insufficient to meet the Paris Agreement targets of keeping global warming to 2°C, and were still far from achieving the 1.5°C limits. The ambition levels in second-generation NDCs could result in global warming of 2.1°C to 2.8°C by the end of the century, depending on underlying assumptions and major uncertainties. Even if all NDC commitments of the second-generation NDCs were implemented, the carbon budget to stay within 1.5°C would be used up by 2032.
- As stakeholders collectively work to update and raise ambition in the third generation of NDCs, SLOCAT has developed a five-point plan for transport in third-generation NDCs that outlines key recommendations and related case studies.
- To support stronger transport actions and commitments in third-generation NDCs, specialised transport organisations have developed a range of guiding documents.
- In the lead-up to the 2023 UN Climate Change Conference in Dubai, United Arab Emirates (COP 28), a group of organisations launched a call to double the share of energy-efficient and fossil-free forms of land transport by 2030, with the goal of fossil-free land transport by 2050. The call to action attracted more than 60 multi-stakeholder signatories (including Chile and Colombia) and emphasised shifts towards public transport, walking, cycling, and rail freight, as well as electric vehicles and railways, while drastically scaling up the use of renewable and zero-emission energy sources.
- Building on the call to action and other multi-stakeholder efforts, the Climate Champions Team launched the Avoid and Shift Breakthrough at the 2024 UN Climate Change Conference in Baku, Azerbaijan (COP 29).

Context, challenges and opportunities

Transport is the second largest and fastest growing sector for greenhouse gas emissions, accounting for 21.9% of global carbon dioxide (CO_2) emissions in 2023, due largely to its high dependence (95.4%) on fossil fuels for energy use.[1] The Intergovernmental Panel on Climate Change (IPCC) has noted that swift action is essential to align the transport sector with the climate goals of the Paris Agreement. To achieve scenarios that limit global warming to 1.5 degrees Celsius (1.5°C), global transport CO_2 emissions must be reduced by at least 59% by 2050, compared to 2020 levels.[2]

The Global Stocktake (GST) on the implementation of the Paris Agreement, agreed at the 2024 United Nations (UN) Climate Change Conference in the United Arab Emirates (COP 28), called on countries to urgently reduce emissions from road transport through a range of pathways, including investing in infrastructure and services as well as scaling up zero- and low-emission vehicles.[3] The GST also asked countries to phase out inefficient fossil fuel subsidies and to transition away from fossil energy use in a just, orderly, and equitable manner, accelerating action in this crucial decade to meet the goal of net zero emissions by 2050.[4]

The year 2025 is a critical opportunity to accelerate the transport sector's key role in achieving climate and sustainability goals and to deliver co-ordinated action for long-lasting impact. Against a shifting geopolitical backdrop, 2025 marks:

- the tenth anniversary of the Paris Agreement;
- the elaboration by countries of new Nationally Determined Contributions (NDCs) towards reducing emissions under the Paris Agreement, with targets and actions for 2035;
- the five-year countdown to the implementation deadline for the UN Sustainable Development Goals (SDGs) and the IPCC target to reduce economy-wide greenhouse gas emissions 43% to limit global warming to 1.5°C; and
- the eve of the UN Decade of Sustainable Transport 2026-2035, set to start in January 2026.[5]

However, 95% of the Parties to the Paris Agreement missed the initial deadline of 10 February 2025 to submit new NDCs outlining their targets and actions for 2035.[6] Ahead of the November 2025 UN Climate Change Conference in Belém, Brazil (COP 30), countries are expected to have set enhanced targets and actions for 2035 in their new NDCs. Submissions of new NDCs are required by September 2025 to be featured in the NDC Synthesis Report of the UN Framework Convention on Climate Change (UNFCCC).[7] The new NDCs are officially called NDCs 3.0 and are referred to here as "third-generation NDCs" to cover a broader scope, as defined below.

The new NDCs come at a crucial juncture for countries to act on limiting global warming to 1.5°C by advancing ambitious 2035 targets and actions on sustainable, low-carbon transport that align with GST recommendations (Figure 1).[8] The NDCs are also an opportunity for integrated action with national transport strategies, co-ordination across national and sub-national governments, and stronger public-private partnerships for effective implementation over the five-year period 2025-2030.

FIGURE 1. Benefits of robust transport actions in new NDCs

Source: See endnote 8 for this section.

Overview and scope

This spotlight provides a comprehensive assessment of transport in third-generation NDCs, taking into account any submissions up to 1 August 2025. GIZ and SLOCAT will release more detailed assessments covering all NDCs submitted in the run-up to COP 30 in November 2025 and make them accessible in SLOCAT's NDC Library. [9] In this spotlight, any NDCs submitted since November 2024 are considered third-generation NDCs, regardless of the document title or version number (Box 1). This methodology is defined through the NDC Transport Tracker developed by GIZ and SLOCAT, and the NDCs are sourced from the UNFCCC's NDC Registry.[10]

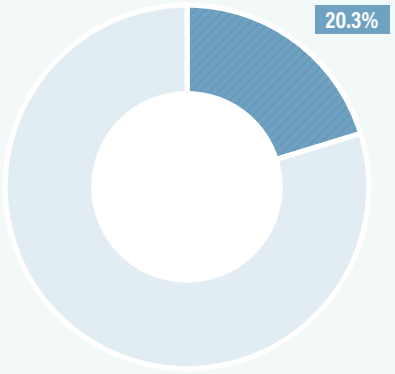
Because the number of submitted third-generation NDCs remains very low – with 29 submissions as of August 2025 – pinpointing clear trends is difficult. This is why the figures included in this spotlight convey both percentage shares and absolute numbers. Where relevant, third-generation NDCs are compared to the first- and second-generation NDCs to identify any progress and persistent gaps in transport ambition.

Box 1. Key terms used by NDCs and in this assessment

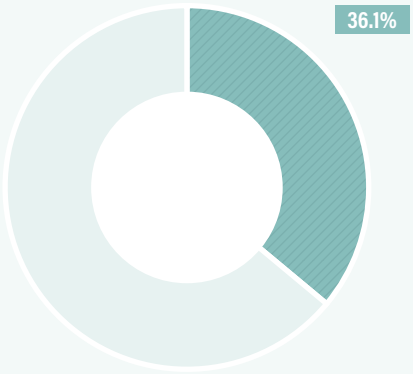
- **Third-generation NDC:** Any NDC submission since November 2024 is regarded as part of the third generation of NDCs. First-generation NDCs refer to the intended NDCs and first ratified NDCs of 2015-2018. Second-generation NDCs, submitted between 2019 and 2024, were mostly updates to a first or second NDC.
- **Conditionality in NDCs:** When a target or action is indicated as *unconditional* in an NDC, a country can pursue it without international support. In contrast, *conditional* targets or actions require international, external support in the form of financial assistance, capacity building or technology transfer.
- **Target:** A *target* is defined as any future commitment that features a quantitative value to be achieved by a certain year. A *non-greenhouse gas target* is a quantified target in an NDC that is not directly aimed at greenhouse gas emissions (for example, a target to shift the amount of goods moved by rail 20% by 2035). Another potential non-greenhouse gas target is an *Avoid target*, which focuses on reducing motorised transport overall (such as reducing the use of private vehicles 15% by 2035 through remote work or compact city planning). An NDC can include multiple non-greenhouse gas targets.
- **Adaptation and mitigation:** Climate action is mainly categorised as mitigation or adaptation. In this assessment, adaptation comprises any activities that a country intends to pursue to adapt to the changing climate and to raise the resilience of transport systems and infrastructure against climate-exacerbated weather events. Mitigation covers any activities to reduce the environmental impact of transport.
- **National Adaptation Plans (NAPs):** NAPs are the main mechanism for low- and middle-income countries to develop adaptation and resilience efforts under the UNFCCC. They were developed specifically for least developed countries at COP 16 in Cancun, Mexico in 2010, although other developing countries also were invited to elaborate NAPs. High-income countries have been invited to develop NAPs since 2023, through a call to all countries in the first outcome of the Global Stocktake. (See Spotlight on Transport in National Adaptation Plans.)

FIGURE 2. Shares of greenhouse gas emissions covered by third-generation NDCs, as of August 2025

Share of total greenhouse gas emissions covered by 29 third-generation NDCs



Share of transport greenhouse gas emissions covered by 29 third-generation NDCs



The countries that submitted third-generation NDCs as of August 2025 contributed 20.3% of the world's economy-wide greenhouse gas emissions and 36.1% of global transport emissions in 2023 (excluding international aviation and shipping). This high share of transport emissions was driven by major emitters such as Brazil, Canada, Japan, the United Kingdom and the United States.

Note: Calculations exclude emissions from international aviation and shipping.

Source: See endnote 17 for this section.

As of August 2025, a total of 29 third-generation NDCs had been submitted to the UNFCCC.[11] The submissions were distributed equally across regions when considering the relative number of countries per region. Niue and Somalia were the only low-income countries with a third-generation NDC.[12] NDCs from low- and middle-income countries are important because future transport demand growth is projected to occur mainly in these country income groups. In previous periods, 169 first-generation NDCs were submitted from 2015 to 2018, and 154 second-generation NDCs were submitted from 2019 to 2024 (not reflecting any revised NDCs within each generation).[13]

- The third-generation submissions as of August 2025 included seven NDCs from Europe (24.2%), six NDCs each (20.7%) from Africa and Latin America and the Caribbean, five from Asia (17.2%), three (10.3%) from Oceania and two (6.9%) from North America.[14]
- Among the 29 total, 15 NDCs (51.7%) were from middle-income countries and 12 (41.4%) were from high-income countries.[15]
- The submissions from least developed countries were from Nepal, Somalia and Zambia.[16]

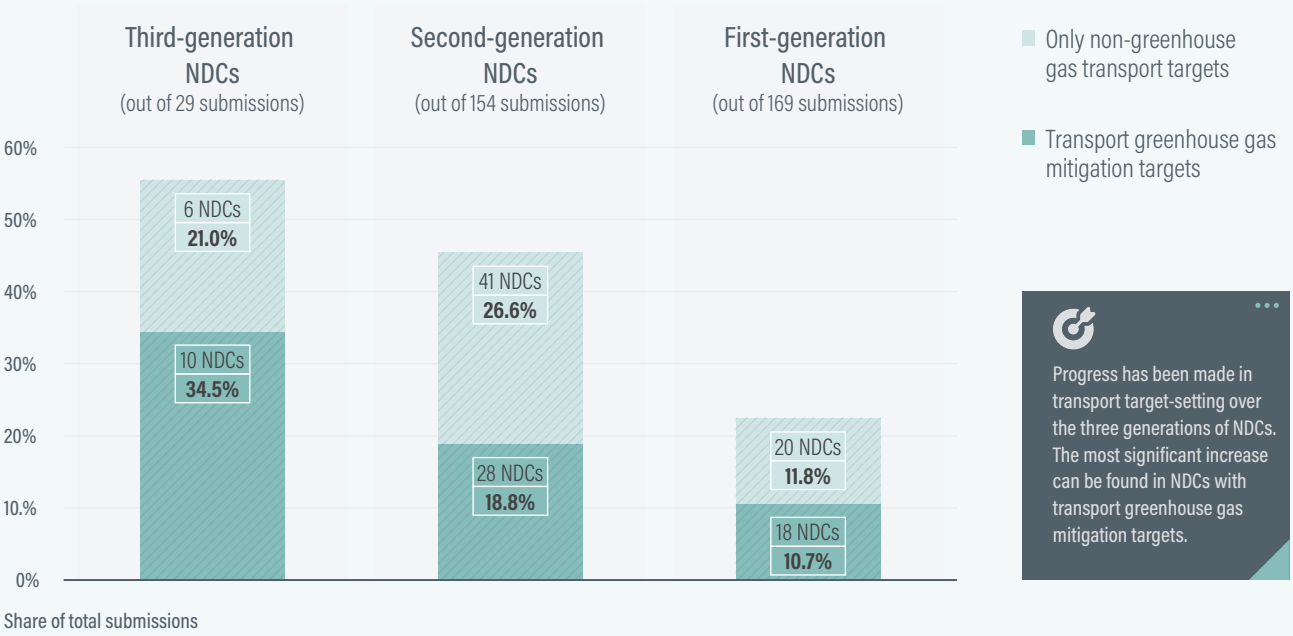
NDCs are an opportunity to express the need for international support for climate action. Low- and middle-income countries benefit from submitting new NDCs outlining conditional targets and actions because it could increase their access to international climate finance, technical assistance and co-operation.

The countries that submitted third-generation NDCs as of August 2025 contributed 20.3% of the world's economy-wide greenhouse gas emissions and 36.1% of global transport emissions in 2023 (excluding international aviation and shipping) (Figure 2).[17] This high share of transport emissions was driven by major emitters such as Brazil, Canada, Japan, the United Kingdom and the United States.[18]

Assessment of transport in third-generation NDCs

Progress has been made in transport target-setting over the three generations of NDCs. Of the third-generation NDCs submitted as of August 2025, 34.5% (10 in total) featured explicit targets for mitigating transport greenhouse gas emissions; this was up from only 11% (18 total) of first-generation NDCs and 19% (28 total) of second-generation NDCs (Figure 3).[19] More broadly, transport targets of all kinds (including non-greenhouse gas targets) were featured in 55% of third-generation NDCs, compared with 23% of first-generation NDCs and 46% of second-generation NDCs.[20]

FIGURE 3. Transport targets included in each generation of NDCs, as of August 2025



Progress has been made in transport target-setting over the three generations of NDCs. The most significant increase can be found in NDCs with transport greenhouse gas mitigation targets.

Source: See endnote 19 for this section.

Of the 10 third-generation NDCs that contained transport greenhouse gas mitigation targets as of August 2025, 4 had unconditional targets, 2 had conditional targets, 1 had a combination of conditional and unconditional targets, and 3 had unclear conditions (Table 1).[21] The targeted years were 2030 (three countries), 2035 (five countries) and 2050 (two countries).[22]

In total, 32 non-greenhouse gas transport targets were included in third-generation NDCs as of August 2025.[23] As with second-generation NDCs, the most common type of non-greenhouse gas transport target was for zero-emission vehicles, accounting for 44% of the total (Figure 4).[24]

The third-generation NDCs as of August 2025 embraced a wider portfolio of actions for reducing transport emissions than did previous generations, although a strong focus on electrification persisted.[25] Each third-generation NDC submission included an average of 7.9 actions for mitigating transport emissions, up from 5.8 actions on average in second-generation NDCs – indicating a growing emphasis on emission mitigation in the transport sector.[26]

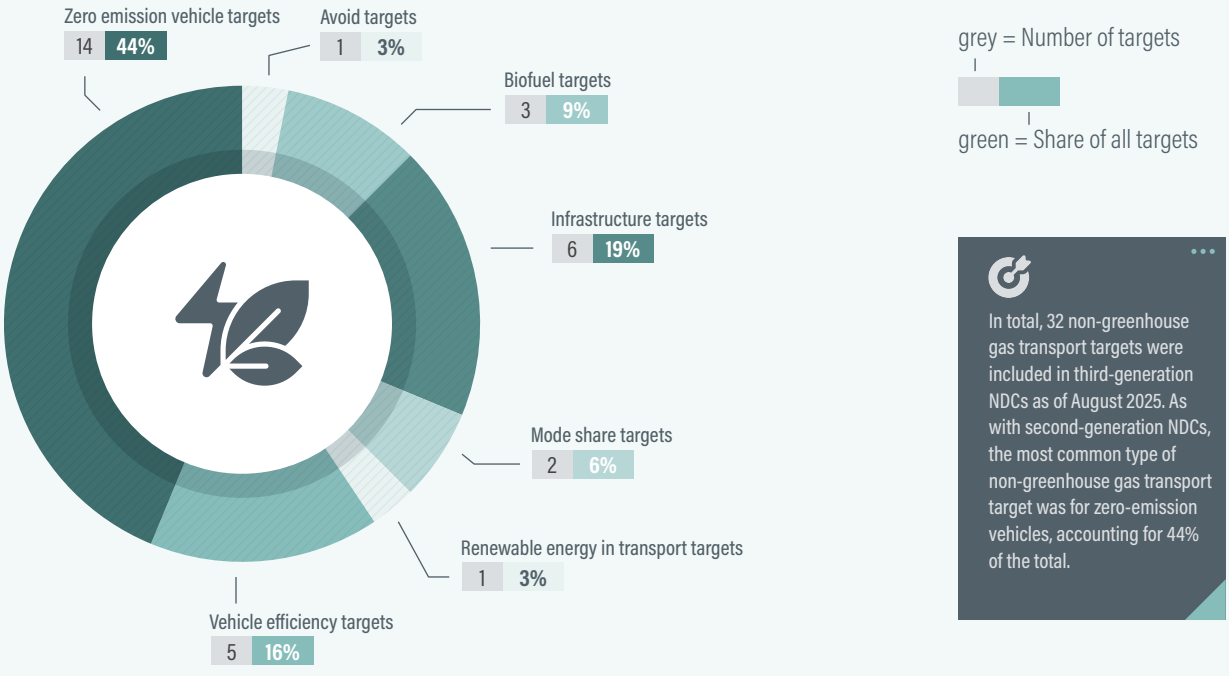
- In the third-generation NDCs, emission mitigation measures for transport focused mainly on mode shift and demand management (68 actions, or 29.7%) as well as electrification (64 actions, or 27.9%) (Figure 5).[27]
- Electrification continued to gain traction as a viable technological solution, with nearly half of the electrification actions that cited a specific transport mode having a focus on road transport vehicles (mainly bus fleets and passenger cars); however, half of all electrification actions did not explicitly mention a transport mode.[28]
- Only 14 mitigation actions (6.1%) were related to aviation and maritime transport (domestic and international), reflecting a gap also observed in second-generation NDCs.[29] This gap may exist because the international dimensions of aviation and shipping are under the scope of other international processes (outside the UNFCCC, which governs the NDCs), and because decarbonising these sectors remains technically, financially and politically challenging.
- The third-generation NDC of the United Arab Emirates (UAE) contains a broad portfolio of actions covering infrastructure development, land use policies, vehicle regulations and fuel efficiency standards. The UAE has implemented a national policy for electric vehicles, expansion of charging stations, and smart mobility; and several cities plan to electrify public transport, taxis and government fleets in the coming decades. Abu Dhabi, Dubai and other cities aim to pursue sustainable urban planning with a focus on mixed land-use and development of walking and cycling infrastructure.[30]

TABLE 1. Transport greenhouse gas emission mitigation targets in third-generation NDCs, as of August 2025

Country	Targeted reductions in transport emissions	Type of target
Andorra	50% below business-as-usual levels in domestic transport emissions by 2030	Unclear conditionality
Belize	127 gigagrams of CO_2 equivalent less by 2030 and 312 gigagrams of CO_2 equivalent by 2035	Conditional
Botswana	429 gigagrams of CO_2 equivalent less by 2030 (of which 146.78 gigagrams are conditional)	Unconditional, conditional
Marshall Islands	40% below 2010 levels in domestic shipping emissions by 2030 and complete decarbonisation by 2050	Unclear conditionality
Nepal	1,426.22 gigagrams of CO_2 equivalent less by 2030 and 2,731.57 gigagrams of CO_2 equivalent by 2035	Conditional
Republic of Moldova	52% below 1990 levels by 2030	Unconditional
Saint Lucia	22% below 2010 levels by 2035 in transport and energy	Unconditional
Somalia	33% below business-as-usual levels by 2035	Unclear conditionality
Switzerland	41% below 1990 levels by 2035, 57% by 2040 and 100% by 2050	Unconditional
United Arab Emirates	20% below 2019 levels by 2035, reaching 24.2 million tonnes of CO_2 equivalent	Unconditional

Source: See endnote 21 for this section.

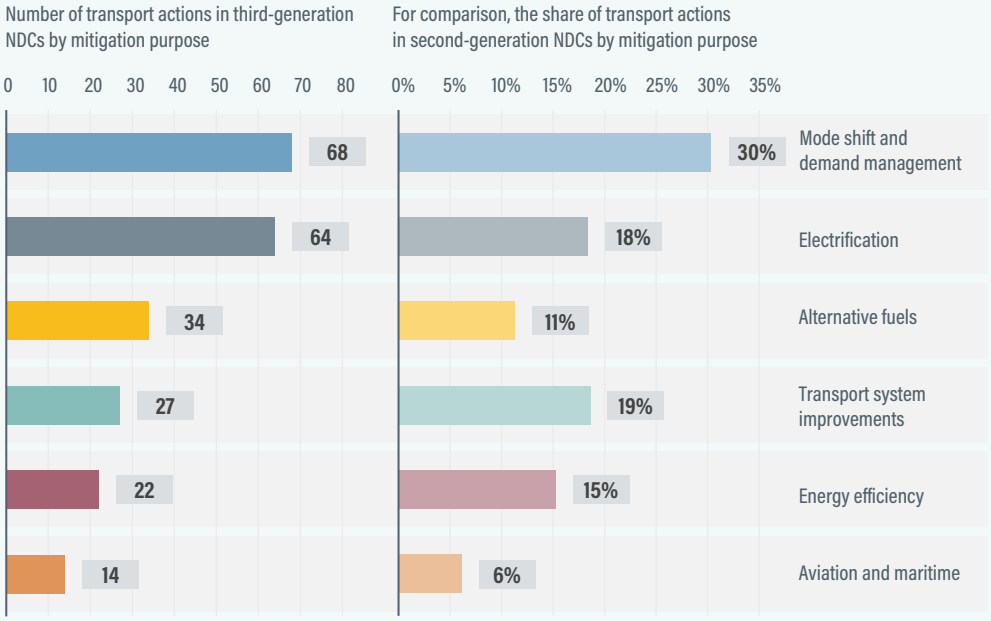
FIGURE 4. Non-greenhouse gas transport targets in third-generation NDCs, as of August 2025



In total, 32 non-greenhouse gas transport targets were included in third-generation NDCs as of August 2025. As with second-generation NDCs, the most common type of non-greenhouse gas transport target was for zero-emission vehicles, accounting for 44% of the total.

Source: See endnote 24 for this section.

FIGURE 5. Emission mitigation actions in third-generation NDCs compared to second-generation NDCs, as of August 2025



Comparing the second- and third-generation NDCs, as of August 2025, shows that electrification keeps gaining traction, with nearly half of all actions focusing on electrification.

Source: See endnote 27 for this section.

The full potential of a balanced Avoid-Shift-Improve (A-S-I)[i] framework for sustainable transport remains untapped, as 66% of the transport mitigation actions in third-generation NDCs as of August 2025 focused on "Improve" actions.[31] By comparison, 23.1% of the transport emission mitigation actions focused on "Shift" and only 10.5% on "Avoid" (Figure 6).[32] This strong emphasis on "Improve" measures has been a persistent trend since the first-generation NDCs, indicating that the transformative potential of more balanced A-S-I strategies remained largely underutilised. "Avoid" and "Shift" strategies can account for major emission reductions in the transport sector, at much lower costs than "Improve" strategies.[33]

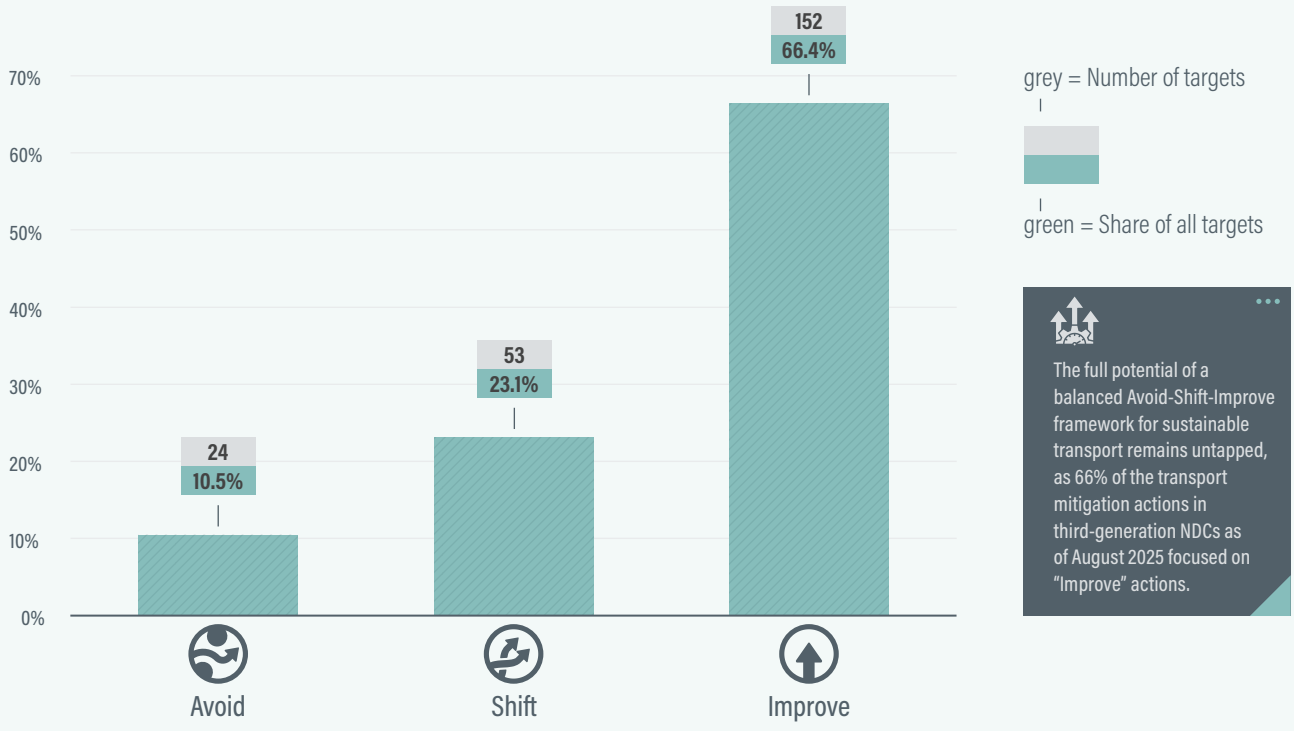
Singapore's NDC leverages the potential of Avoid and Shift actions. Through its "Walk-Cycle-Ride" strategy, Singapore commits to encouraging active mobility and prioritises public and shared transport as the primary modes of travel. The cycling infrastructure and metro system are to be expanded while ensuring access to the metro system through better walkways.[34]

Despite freight transport's large contribution to both transport and overall greenhouse gas emissions, the sector remained overlooked in NDCs, with few of the third-generation NDCs as of August 2025 featuring activities to mitigate these emissions. Freight activity is projected to more than double from 2020 to 2050, bringing rapidly rising emissions from freight transport.[35] **The increase in climate-induced disasters threatens global supply chains and freight operations, making it crucial to boost resilience efforts in freight transport and to adapt to changing environments. In a major gap, no third-generation NDCs as of August 2025 included freight transport adaptation actions.**[36] (See 4.1 Freight Transport and Logistics.)

- Of the 29 third-generation NDCs as of August 2025, only 9 (Brazil, Canada, Maldives, Monaco, Montenegro, Niue, Republic of Moldova, Uruguay and the United States) included mitigation actions covering freight or a combination of freight and passenger transport.[37]
- The NDC of the United States mentions establishing

i The Avoid-Shift-Improve framework has been central to sustainable, low-carbon transport for more than a decade. It follows an implicit hierarchy, with appropriate and context-sensitive "Avoid" measures (which avoid and reduce the need for motorised travel) intended to be implemented first, followed by "Shift" measures (which shift to more sustainable modes) and finally by "Improve" measures (which improve transport modes). See https://slocat.net/asi and H. Dalkmann and C. Brannigan (2007), Transport and Climate Change, Module 5e: Sustainable Transport – A Sourcebook for Policy-Makers in Developing Cities, GIZ GmbH, https://changing-transport.org/wp-content/uploads/2007_dalkmann_brannigan_transportandclimatechange.pdf.

FIGURE 6. Mitigation actions by Avoid, Shift and Improve in third-generation NDCs, as of August 2025



Source: See endnote 32 for this section.

zero-emission freight hubs and corridors and expanding intermodal freight operations through improved collaboration with stakeholders.[38]

- Uruguay's NDC includes pursuing intramodality for freight and passenger transport.[39]
- The NDCs of Brazil, Canada, Maldives and Montenegro focus on vehicle efficiency or electrification of heavy-duty vehicles.[40]

Only seven of the third-generation NDCs (Belize, Canada, the Marshall Islands, Monaco, Niue, the United Kingdom and the United States) as of August 2025 included specific actions to mitigate emissions from domestic and international aviation and/or shipping.[41] Aviation contributed 14% of global transport greenhouse gas emissions in 2023, while maritime transport was responsible for 8%.[42] In many countries, the growth in aviation-related emissions has outpaced overall emission reductions. Decarbonising maritime transport is also seen as crucial, but progress is slow. (See 4.9 Aviation and 4.10 Shipping.)

- Marshall Islands' NDC sets a target to reduce greenhouse gas emissions from domestic shipping 40% below 2010 levels by 2030, aiming for full decarbonisation by 2050.[43] The NDC highlights pilot projects on low-emission vessels, wind-assisted propulsion, fuel-efficient engines and the use of solar power.[44]
- Belize's NDC highlights the importance of maritime transport for the economy, and a pilot project aims to improve the fuel efficiency of vessels and reduce port infrastructure emissions by 2035.[45]
- The NDCs of both Canada and the United States reference sustainable aviation fuels.[46]

The scope of third-generation NDCs has widened to cover sustainability topics such as a just transition, air quality and public health. Lesotho and the United Kingdom have used third-generation NDCs to reinforce linkages between their climate and broader sustainability commitments.[47]

- Lesotho's NDC connects transport actions to various SDGs, including SDG 3 (Good Health and Well-Being), SDG 7 (Affordable and Clean Energy), SDG 11 (Sustainable Cities and Communities), SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action).[48]
- The United Kingdom's NDC highlights that a just transition is central to the national approach and notes that green and clean jobs sourcing new skills and technologies will be created through support from two entities: the Office for Clean Energy Jobs and Skills England.[49]

Most of the transport actions in third-generation NDCs as of August 2025 did not mention specific transport modes. Where modes were mentioned, the focus was largely on road vehicles (Figure 7)**.**[50] **Transport adaptation actions in particular have missed the opportunity to refer to specific modes.**[51]

Only two of the third-generation NDCs as of August 2025 featured transport adaptation targets, both of them from least developed countries (Lesotho and Nepal).[52] By comparison, eight second-generation NDCs (5% of the total) featured transport adaptation targets.[53] A potential reason could be that more countries are outlining their specific adaptation and resilience actions through National Adaptation Plans (NAPs) (See Spotlight on Transport in National Adaptation Plans).

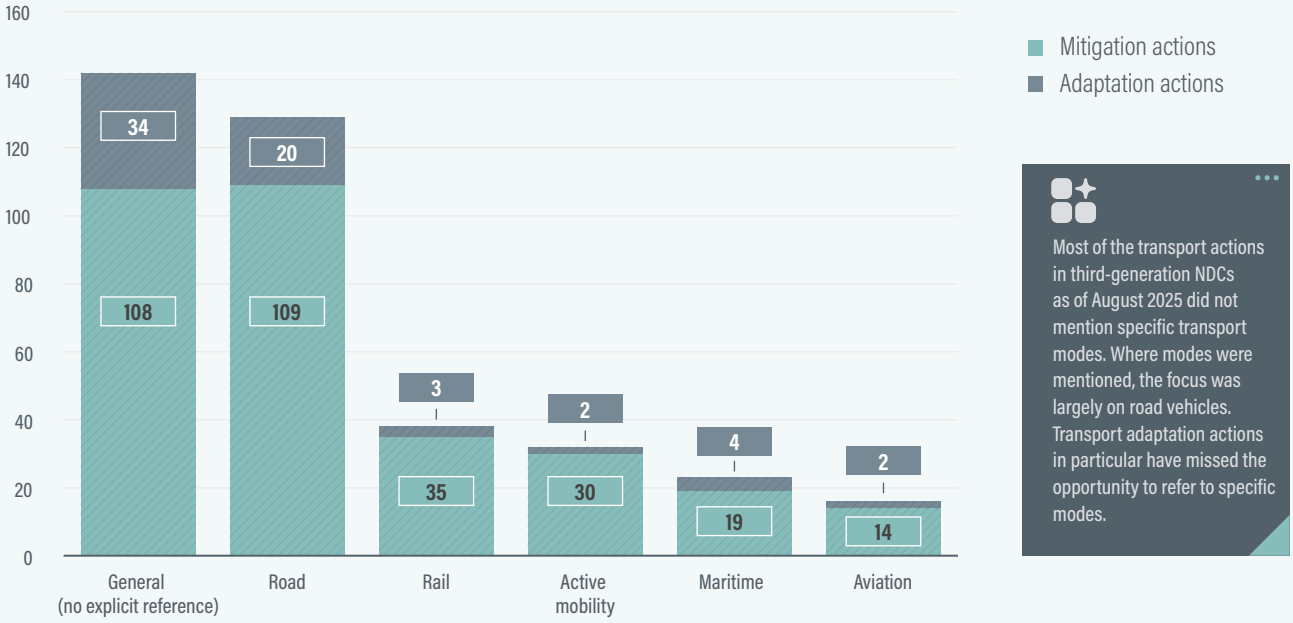
- Lesotho's NDC sets a target to strengthen standards to climate-proof roads and critical public infrastructure, with 10 climate-proof codes to be revised by 2025.[54]
- In its NDC, Nepal aims to embed climate-resilient planning for transport infrastructure projects in revised regulations and to equip all major highways with early warning systems by 2030.[55]

NDC content on adaptation can draw on NAPs to strengthen the vital connections between mitigation and adaptation efforts, supporting inclusive, low-carbon and resilient connectivity and economic growth. Adaptation and mitigation efforts are mutually reinforcing, as adaptation helps to cope with the unavoidable effects and creates the resilient foundation for mitigation action and sustainable development.

In addition to its significant contribution to climate change, the transport sector is increasingly exposed to its consequences.[56] Transport disruptions have severe impacts on communities and economies. Climate-induced disasters and extreme weather events caused around USD 15 billion in direct damages to transport systems annually, with low- and middle-income countries bearing a disproportionately high share (around USD 8 billion) relative to their gross domestic product (GDP).[57] (See 1.4 Building Adaptation and Resilience Within Transport Systems and Across Communities and economies.)

Sixteen of the third-generation NDCs (55% of the total) as of August 2025 contained transport adaptation actions, an improvement from the 42% of second-generation NDCs with such actions.[58] **As with earlier NDCs, the transport adaptation actions in third-generation NDCs had a strong focus on structural and technical actions** (54% of the NDCs, 29 actions)**, followed by institutional and regulatory actions** (24%, 13 actions) (Figure 8).[59]

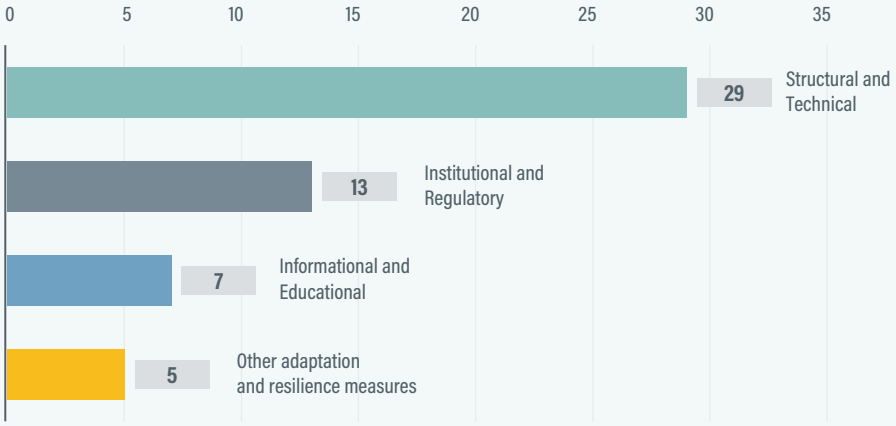
FIGURE 7. Modes referenced in transport actions in third-generation NDCs, as of August 2025



Most of the transport actions in third-generation NDCs as of August 2025 did not mention specific transport modes. Where modes were mentioned, the focus was largely on road vehicles. Transport adaptation actions in particular have missed the opportunity to refer to specific modes.

Source: See endnote 51 for this section.

FIGURE 8. Transport adaptation actions in third-generation NDCs, as of August 2025



As with earlier NDCs, the transport adaptation actions in third-generation NDCs had a strong focus on structural and technical actions (54% of the NDCs, 29 actions), followed by institutional and regulatory actions (24%, 13 actions).

Source: See endnote 60 for this section.

- Brazil's NDC points to several adaptation-focused plans and initiatives in place or under development, such as the National Adaptation and Mitigation Strategies, AdaptaBrasil, and the Green and Resilient Cities Plan.[60]
- Kenya's NDC features efforts to adopt guidelines for better design and construction of climate-proof infrastructure.[61]
- Maldives' NDC commits to enhancing the resilience and climate-proofing of critical transport infrastructure such as airports and maritime ports to better withstand extreme weather events and sea-level rise linked to climate change.[62]
- Niue's NDC outlines resource mobilisation for the provision of climate-resilient utilities for road infrastructure, with specific activities focused on comprehensive risk assessments, disaster management plans and integrated village development.[63]

Way forward to enhance transport in NDCs

Although it is too early to assess the collective impact of the 29 third-generation NDCs submitted as of 1 August 2025, initial reviews suggest that the ambition remains insufficient to meet the Paris Agreement goal of limiting global warming to 1.5°C. A parallel assessment of 22 third-generation NDCs as of June 2025 found that the new commitments would result in greenhouse gas emissions of 51.1 gigatonnes of CO_2 equivalent by 2035 (around 36% from transport, if accounting for the current NDC submissions).[64] Although this represents a reduction of 1.4 gigatonnes of CO_2 equivalent compared to 2030 levels, it is still well above the emission levels required to limit warming to 2°C (36 gigatonnes) or 1.5°C (25 gigatonnes) by 2035.[65]

(See 2.1 National Transport Pathways to Reach Climate and Sustainability Goals.)

- Japan's third-generation NDC includes economy-wide targets for 60% emission reduction by 2035 and 73% by 2040 (compared to 2013 levels).[66] According to the Climate Action Tracker, this falls short of a 1.5°C-compatible pathway because Japan would need to cut emissions 81% below 2013 levels by 2035.[67]
- Although the UAE's third-generation NDC increases both economy-wide and sectoral ambitions for 2035, the absence of updated 2030 targets raises concerns about the feasibility of achieving these goals.[68]

Studies based on NDC submissions as of October 2024 showed that the commitments made in second-generation NDCs were also insufficient to meet the Paris Agreement targets of keeping global warming to 2°C, and were still far from achieving the 1.5°C limits.[69] The ambition levels in second-generation NDCs could result in global warming of 2.1°C to 2.8°C by the end of the century, depending on underlying assumptions and major uncertainties. Even if all NDC commitments of the second-generation NDCs were implemented, the carbon budget to stay within 1.5°C would be used up by 2032.[70]

As stakeholders collectively work to update and raise ambition in the third generation of NDCs, SLOCAT has

developed a five-point plan for transport in third-generation NDCs that outlines key recommendations and related case studies (Figure 9).[71] The plan was inspired by similar efforts by the World Resources Institute (WRI) and builds on SLOCAT's 2020 recommendations.[72]

To support stronger transport actions and commitments in third-generation NDCs, specialised transport organisations have developed a range of guiding documents (Figure 10)**.**[73] These resources either offer general guidance or focus on specific topics such as active mobility, popular transport, public transport and rail. The UN Economic Commission for Europe is developing a guidance document on inland transport in NDCs.[74] Such resources aim to help policy makers enhance the role of transport in NDCs by offering illustrative examples on setting a vision, defining targets and policies, and sharing best practices.

In the lead-up to the 2023 UN Climate Change Conference in Dubai, UAE (COP 28), a group of organisations launched a call to double the share of energy-efficient and fossil-free forms of land transport by 2030, with the goal of fossil-free land transport by 2050.[75] **The call to action attracted more than 60 multi-stakeholder signatories (including Chile and Colombia) and emphasised shifts towards public transport, walking, cycling, and rail freight, as well as electric vehicles and railways, while drastically scaling up the use of renewable and zero-emission energy sources.**[76] While each country will adopt a nationally determined approach, the call outlines a series of universal enablers to meet this target. The call to action was issued by SLOCAT and REN21, jointly with the Institute for Sustainable Development and International Relations (IDDRI), the Institute for Transportation and Development Policy (ITDP), the International Union of Railways (UIC), the International Association of Public Transport (UITP) and WRI.

Building on the call to action and other multi-stakeholder efforts, the Climate Champions Team launched the Avoid and Shift Breakthrough at the 2024 UN Climate Change Conference in Baku, Azerbaijan (COP 29).[77] The Breakthrough features the same doubling goal for land transport and seeks to strengthen transport targets that focus on "Avoid" and "Shift" measures in complementarity with other initiatives that favour "Improve" measures.[78]

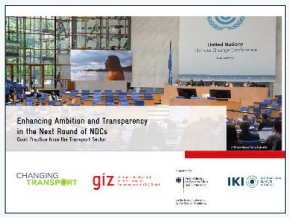
Additional resources for third-generation NDCs have been developed by the Climate and Clean Air Coalition, the Climate Action Network, Climate Action Tracker, the NDC Partnership, UN-Habitat and WRI.[79]

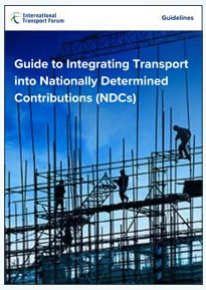
FIGURE 9. SLOCAT's five-point plan for transport in third-generation NDCs

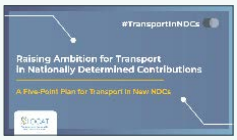
Source: See endnote 71 for this section.

FIGURE 10. Documents supporting stronger transport actions and commitments in third-generation NDCs

General transport guidance



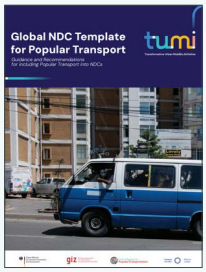




Mode-specific guidance

Active mobility

Popular transport



Public transport

Railways

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SPOTLIGHT

Transport in National Adaptation Plans

KEY FINDINGS

- The need for adaptation planning in transport is increasingly urgent as the sector has experienced among the most severe impacts of climate change.
- In 2023, insurance companies lost an estimated USD 250 billion in combined assets due to natural disasters, or more than double the five-year average of USD 105 billion (2018-2023). Climate-induced disasters and extreme weather events already cause around USD 15 billion a year in direct damages to transport systems, with low- and middle-income countries bearing a high share (around USD 8 billion) relative to their gross domestic product (GDP).
- The main mechanism for developing adaptation and resilience efforts under the United Nations Framework Convention on Climate Change (UNFCCC) is National Adaptation Plans (NAPs). Because NAPs are not time-bound, they allow countries to engage in medium- to long-term planning. This spotlight draws on countries' most recent NAP submissions to the UNFCCC (from 2023 to 1 August 2025).
- As of 1 August 2025, a total of 74 NAPs had been submitted to the UNFCCC. Of these, one-third (22, or 30%) were from African countries, 17 (23%) from Latin America and the Caribbean, 16 (21%) from Asia, 11 (15%) from Europe, 6 (8%) from Oceania and 2 (3%) from North America.
- The first NAPs (Burkina Faso and Cameroon) date back to 2015, but submissions accelerated greatly in the period 2023-2025, during which nearly half (48%) of all NAPs were submitted (35 total, including 23 in 2023 and 2024 and 12 in 2025). With a few exceptions (Burkina Faso and Uruguay), the submissions during 2023-2025 represented the first and only NAPs from countries.
- Developed country Parties began submitting NAPs to the UNFCCC starting in December 2023, and as of 1 August 2025 ten of these countries had completed the process. This process was supported through the outcome of the first Global Stocktake of 2023, which called on countries to have in place their NAPs, policies, and planning by 2025, with implementation by 2030.
- The UNFCCC's tracking tools reveal a gap between the ambition of NAPs and the actual implementation of adaptation projects. Although most NAPs contain content on transport, few adaptation projects were implemented as of 15 July 2025 in support of transport adaptation and resilience. In some cases, transport activities may be featured in other categories such as infrastructure and the built environment, buildings, cities, industries and appliances.
- Between 2023 and August 2025, six African countries (Burkina Faso, Burundi, Morocco, Mozambique, Zambia and Zimbabwe) submitted NAPs; all of these contain actions to enhance transport adaptation and resilience efforts. A common action area is a focus on climate-resilient standards and codes for the construction of transport infrastructure.
- Nine Asian countries – Azerbaijan, Bangladesh, Bhutan, Israel, Jordan, Mongolia, Pakistan, the Philippines and Thailand – submitted NAPs to the UNFCCC during the period from 2023 to August 2025.
- In Europe, nine countries submitted NAPs between 2023 and August 2025: Austria, Finland, Germany, Ireland, Moldova, the Netherlands, Serbia, Spain and the United Kingdom.
- Six countries in Latin America and the Caribbean submitted NAPs between 2023 and August 2025, including Antigua and Barbuda, Argentina, Ecuador, Haiti, Trinidad and Tobago, and Uruguay; in total, 17 NAPs have been submitted in the region since 2015.
- In North America, Canada submitted a NAP in 2024 and the United States submitted one in early 2025 (in the final weeks of the Biden administration).
- In Oceania, six countries (Fiji, Kiribati, Marshall Islands, New Zealand, Papua New Guinea and Tonga) had submitted NAPs to the UNFCCC as of 1 August 2025; however, only three of these – Marshall Islands, New Zealand and Papua New Guinea – were new submissions between 2023 and mid-2025.
- In contrast to NDCs, very few resources exist for NAPs that provide tailored guidance on incorporating transport content into adaptation plans. Although the UNFCCC maintains a library of supplementary materials to support NAP development, very few focus on specific sectors or thematic areas.
- As of August 2025, no dedicated guidance was available on transport and infrastructure within NAPs.
- Making adaptation and resilience efforts more consistent and effective will require maximising existing synergies between the elaboration and implementation of national transport policies, NAPs, the Sendai Framework for Disaster Risk Reduction, and SDG targets related to resilience and transport.

Context, challenges and opportunities

The world is not on track to meet the Paris Agreement goal of limiting global warming to 1.5 degrees Celsius (°C) by the end of the century. Countries must urgently define pathways to strengthen the resilience and adaptation of their economies and societies to the impacts of climate change. The year 2024 was the warmest in recorded history, with the global mean near-surface temperature reaching 1.55°C (± 0.13°C) above the pre-industrial average.[1] The forecast for 2025-2029 projects that global warming will reach an estimated 1.44°C, with a 90% confidence range of 1.22-1.54°C.[2]

The need for adaptation planning in transport is increasingly urgent as the sector has experienced among the most severe impacts of climate change. In 2023, insurance companies lost an estimated USD 250 billion in combined assets due to natural disasters, or more than double the five-year average of USD 105 billion (2018-2023).[3] Climate-induced disasters and extreme weather events already cause around USD 15 billion a year in direct damages to transport systems, with low- and middle-income countries bearing a high share (around USD 8 billion) relative to their gross domestic product (GDP) (Box 1).[4]

Box 1. Costs of damages to transport assets

Estimates of the costs associated with climate-induced disasters and extreme weather events vary widely, depending on the underlying assumptions and their scope.

Global cost estimates (see 1.4 Building Adaptation and Resilience Within Transport Systems and Across Communities and Economies)

- **Transport systems:** USD 15 billion in direct damages in 2022, including USD 8 billion in low- and middle-income countries.
- **Road and railway assets:** USD 3.1 billion to USD 22 billion per year in direct damages (around 73% caused by flooding) as of 2019.
- **Disruptions to ports from climate extremes:** USD 81 billion in global trade and at least USD 122 billion in economic activity at risk annually, based on 2023 averages.

Regional cost estimates (*see Module 3. Regional Overviews: Trends and Policy Development*)

- **Africa:** An estimated USD 7-15 billion annually from climate-induced disasters as of 2022, possibly rising to USD 50 billion by 2030, representing up to 7% of Africa's GDP on average for that year.
- **Asia-Pacific:** An estimated USD 12 billion in yearly damage to roads, railways, and ports from hazards related to climate change, according to research from 2019 and 2023. Railways shoulder around 25% of these losses, despite accounting for only around 2% of Asia's total transport infrastructure in 2023.
- **Europe:** Projected annual costs from climate change-induced hazards exceeding USD 10.35 billion annually by the 2080s, up 20-fold from 2024. Heat waves already have led to road melting, failures of railway assets, and speed restrictions to prevent track buckling, causing major disruptions and impeding connectivity. Ports, especially in northern and western Europe, are particularly vulnerable to sea-level rise, storm surges and changes in wave agitation.
- **North America:** The United States registered a record high of 28 climate-induced disasters in 2023 (costing USD 96 billion in damages) and 27 events in 2024 (costing USD 182.7 billion). Climate change threatens the supply networks of Canada's Indigenous populations, with around 50 communities (56,000 people) relying on a 6,000-kilometre winter road network.
- **Oceania:** Many Pacific small island developing states (SIDS) are in the world's most natural disaster-prone areas. SIDS comprise two-thirds of the countries that suffer the highest relative losses from natural disasters – between 1% and 9% of their GDP each year. With their small economies, they can incur GDP losses of up to 200% from a single climate-exacerbated disaster, undermining progress towards sustainable development and climate goals.

Source: See endnote 4 for this section.

The main mechanism for developing adaptation and resilience efforts under the United Nations Framework Convention on Climate Change (UNFCCC) is National Adaptation Plans (NAPs). The NAP process builds on the UNFCCC's previous national adaptation programmes of action.[5] The process was developed specifically for least developed countries at the UN Climate Change Conference (COP 16) in Cancun, Mexico in 2010, although other developing countries (mainly low- and middle-income countries) also were invited to elaborate NAPs.[6] Developed country Parties under the UNFCCC have been invited to develop NAPs since 2023, through a call to all countries issued in the first outcome of the Global Stocktake.[7]

Because NAPs are not time-bound, they allow countries to engage in medium- to long-term planning. For example, Nepal's NAP covers the period from 2021 to 2050.[8] This is different from the time frames established under the UNFCCC for Nationally Determined Contributions (NDCs), which reflect five-year cycles (with the current round of NDC submissions for 2025 covering targets and actions up to 2035).[9]


Photo: Debarshi Mukherjee / Climate Visuals Countdown

Most NAPs recognise the crucial role of the transport sector in enhancing resilience and supporting adaptation to climate change impacts. In their NAPs, countries outline detailed activities aimed at strengthening the resilience of transport infrastructure and adapting transport systems. Many NAPs exceed 100 pages and include plans and activities across the economy, including investment and financing needs.

In countries' NDCs, in contrast, adaptation is only one of the three pillars, alongside mitigation and finance. The NDC submissions between 2018 and 2024 (so-called second-generation NDCs) included stronger content on adaptation compared to the third-generation submissions, which (as of 1 August 2025) contained fewer adaptation actions on transport and infrastructure.[10] However, given the low number of third-generation NDCs submitted overall by mid-2025, it is difficult to establish a clear trend. With high-income countries invited to elaborate and submit NAPs, several third-generation NDCs omit details on climate change adaptation and instead refer readers to countries' NAPs for further guidance. (See Spotlight on Transport Ambition in NDCs.)

Key challenges facing NAPs include a lack of overall submissions, as well as knowledge gaps within existing plans. As of mid-2025, ten years after the first NAP was submitted in 2015, half of all countries still had not submitted a plan. Moreover, existing plans reveal clear gaps in knowledge and guidance related to transport. In general, knowledge products on adaptation and resilience in transport are less abundant than products on mitigation. As of mid-2025, no dedicated NAP guidance documents were available to help countries develop robust transport targets and actions.

In the quest to make adaptation and resilience efforts more consistent and effective, there is room to improve synergies across the elaboration and implementation of national transport policies, NAPs, the Sendai Framework for Disaster Risk Reduction, and targets in the UN Sustainable Development Goals (SDGs) related to resilience and transport (e.g., target 9.1 on access to all-season roads).[11]

Trends and coverage of NAPs

This spotlight draws on countries' most recent NAP submissions to the UNFCCC (from 2023 to 1 August 2025). It is based on a review of content related to transport, vehicles and associated areas such as infrastructure resilience as well as urban areas, drainage systems, energy for transport and more. As of mid-2025, more detailed assessment of transport in NAPs was not feasible due to the absence of dedicated assessment typologies and tools. In contrast, extensive assessment has been undertaken for NDCs through use of the NDC Transport Tracker by GIZ and SLOCAT, which systematically evaluates each NDC and long-term low emission development strategies (LT-LEDS) based on specific parameters (See Spotlight on Transport Ambition in NDCs).[12]

Global overview

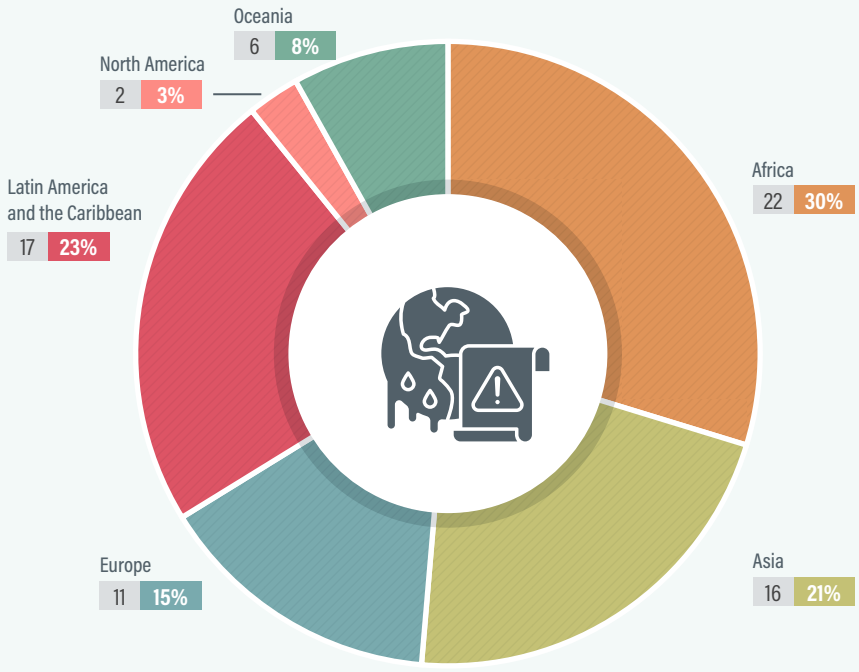
As of 1 August 2025, a total of 74 NAPs had been submitted to the UNFCCC.[13] Of these, one-third (22, or 30%) were from African countries, 17 (23%) from Latin America and the Caribbean, 16 (21%) from Asia, 11 (15%) from Europe, 6 (8%) from Oceania and 2 (3%) from North America (Figure 1).[14] NAPs have been submitted by 16 landlocked developing countries, 22 least developed countries and 13 SIDS.[15] An additional 67 NAPs were in development, and 5 were under draft review (Brunei Darussalam, Kyrgyz Republic, Lesotho, Mali and Somalia), according to the 15 July 2025 update of the UNFCCC's NAP Tracking Tool; only 5 low- and middle-income countries had not initiated the process (Botswana, Djibouti, Libya, Solomon Islands and Yemen).[16] For 14 countries, no information on NAPs was available.[17]

The first NAPs (Burkina Faso and Cameroon) date back to 2015, but submissions accelerated greatly in the period 2023-2025, during which nearly half (48%) of all NAPs were submitted (35 total, including 23 in 2023 and 2024 and 12 in 2025).[18] With a few exceptions (Burkina Faso and Uruguay), the submissions during 2023-2025 represented the first and only NAPs from countries.

Developed country Parties began submitting NAPs to the UNFCCC starting in December 2023, and as of 1 August 2025 ten of these countries had completed the process (Austria, Canada, Finland, Germany, Ireland, the Netherlands, New Zealand, Spain, the United Kingdom and the United States).[19] **This process was supported through the outcome of the first Global Stocktake of 2023, which called on countries to have in place their NAPs, policies, and planning by 2025, with implementation by 2030.**[20]

The UNFCCC's tracking tools reveal a gap between the ambition of NAPs and the actual implementation of adaptation projects (Figure 2).[21] **Although most NAPs contain content on transport, few adaptation projects were implemented as of 15 July 2025 in support of transport adaptation and resilience.**[22] **In some cases, transport activities may be featured in other categories such as infrastructure and the built environment, buildings, cities, industries and appliances.** Although transport is mentioned in nearly every NAP, very few projects focus specifically on adaptation and resilience in transport, and the result area low-emission transport represents the smallest number of approved adaptation projects.[23] (See 6.1 Financing Sustainable Transport in Times of Constrained Public Budgets.)

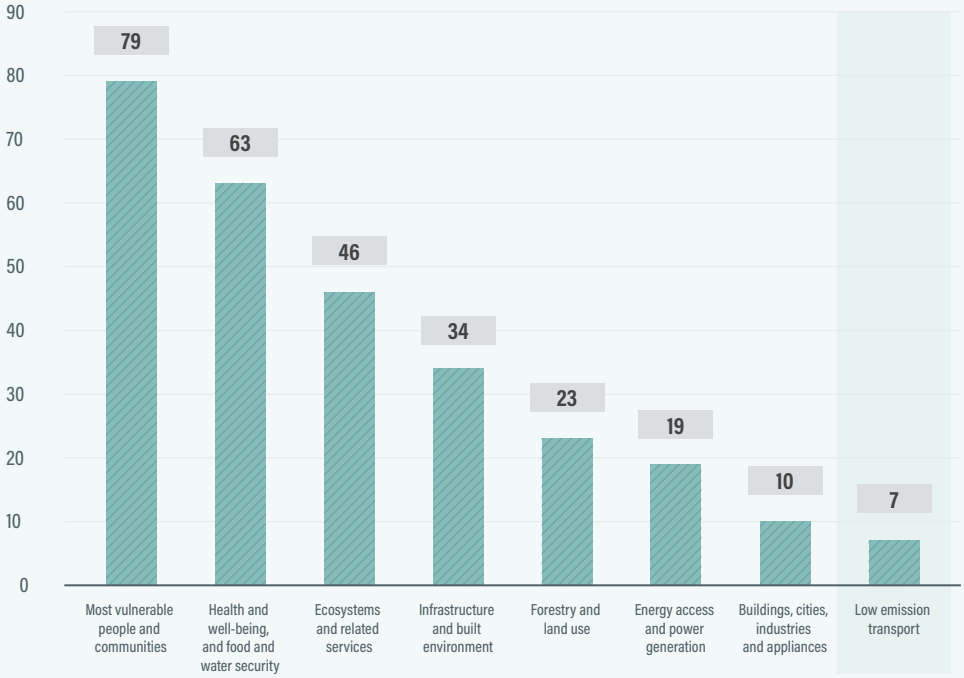
FIGURE 1. NAP submissions by region, as of August 2025



As of 1 August 2025, a total of 74 NAPs had been submitted to the UNFCCC. An additional 67 NAPs were in development, and 5 were under draft review.

Source: See endnote 14 for this section.

FIGURE 2. Adaptation projects in countries with NAPs, as of 15 July 2025



While most NAPs include transport, few adaptation projects had been implemented for transport resilience as of 15 July 2025. Despite being well represented in NAPs, low-emission transport accounts for the fewest approved adaptation projects in countries with NAPs.

Source: See endnote 21 for this section.

Regional examples

Between 2023 and August 2025, six African countries (Burkina Faso, Burundi, Morocco, Mozambique, Zambia and Zimbabwe) submitted NAPs; all of these contain actions to enhance transport adaptation and resilience efforts.[24] **A common action area is a focus on climate-resilient standards and codes for the construction of transport infrastructure.** (See 3.1 Africa Regional Overview.)

- Burkina Faso's NAP commits to increasing the share of "good condition" roads from 28.7% to 65% between 2023 and 2028; increasing the share of all-weather rural roads from 37.1% to 41.38% over the same period; and equipping urban roads with drainage systems and vegetation to provide shade.[25]
- Burundi's 2023 NAP outlines transport adaptation actions focused on inland water transport, including dredging, river training, and the protection of access channels and port basins. It highlights the rehabilitation and maintenance of existing roads to improve resilience to climate change impacts.[26]
- Morocco's 2024 NAP prioritises the development of a vulnerability assessment methodology as a foundation for city adaptation strategies and measures. The assessment will be supported by urban sustainability indicators relating to infrastructure, mobility and other sectors. The NAP also promotes integrating climate change adaptation into all local activities and advancing research to strengthen transport adaptation, including improved understanding of climate change impacts on the sector.[27]
- Mozambique's 2023 NAP identifies floods and tropical cyclones as the highest risks to transport infrastructure, with sea-level rise and temperature changes considered medium risks.[28] Proposed resilience measures include mapping and vulnerability/risk assessment of disaster-prone infrastructure and improving climate insurance. Mozambique also adapted the 2017-2030 Disaster Risk Reduction Master Plan and the SADC Infrastructure Master Plan.[29]

Nine Asian countries – Azerbaijan, Bangladesh, Bhutan, Israel, Jordan, Mongolia, Pakistan, the Philippines and Thailand – submitted NAPs to the UNFCCC during the period from 2023 to August 2025.[30] In the cases of Azerbaijan, Jordan, and Mongolia, transport is mentioned in the NAPs, but no specific actions are outlined. (See 3.2 Asia Regional Overview.)

- Bhutan's 2023 NAP outlines the development of a transport master plan for Thimphu, the construction of climate-resilient road infrastructure, risk assessments (particularly for landslides) and the stabilisation of landslide-prone areas.[31]

Photo Credit: Brigitte Leoni / UNISDR

- The Philippines' 2024 NAP highlights comprehensive planning and response mechanisms and adequate institutional capacity as key adaptation priorities to ensure resilient, adequate and sustainable transport infrastructure and related services. Measures include integrating climate risk into the planning of roadways and transport hubs, and climate-proofing critical transport infrastructure (e.g., through landslide protection measures).[32]
- Thailand's 2024 NAP emphasises mixed-use developments to reduce reliance on long-distance transport.[33]

In Europe, nine countries submitted NAPs between 2023 and August 2025: Austria, Finland, Germany, Ireland, Moldova, the Netherlands, Serbia, Spain and the United Kingdom.[34]

- Moldova's 2024 NAP contains extensive transport content, including commitments to road construction and maintenance, upgrading technical standards, improving financial assessment mechanisms, climate-proofing transport infrastructure (roads, bridges and railways) and modernising drainage systems.[35] A key enabler will be directing funding to adaptation to support risk research, impact assessment, planning and capacity building. The NAP also details provisions on regulatory and institutional frameworks, including laws and codes for aviation, road transport and railways.[36]
- Serbia's 2024 NAP outlines the impacts of climate hazards on road transport, including reduced safety and functionality, extreme damage and increased restoration needs.[37] By 2026, Serbia aims to develop a methodology for climate change vulnerability and risk assessment for road infrastructure.[38]

Six countries in Latin America and the Caribbean submitted NAPs between 2023 and August 2025, including Antigua and Barbuda, Argentina, Ecuador, Haiti, Trinidad and Tobago, and Uruguay; in total, 17 NAPs have been submitted in the region since 2015.[39]

- Uruguay has issued several specialised NAPs with thematic focuses on cities and infrastructure (2021), agriculture (2021), coastal adaptation (2021) and energy (2024).[40]
- Argentina's 2023 NAP aims to adapt transport infrastructure and operations to climate change by promoting sustainable urban transport, strengthening railways and waterways, and improving transport energy efficiency through the replacement of fossil fuels with renewable energy.[41]
- Haiti's 2023 NAP seeks to enhance infrastructure resilience through improved construction standards, zoning regulations, risk and disaster management, infrastructure maintenance and urban planning.[42]

In North America, Canada submitted a NAP in 2024 and the United States submitted one in early 2025 (in the final weeks of the Biden administration).[43] (*See 3.5 North America Regional Overview.*)

- Canada's NAP highlights regional adaptation challenges, noting that warmer winters have made ice roads less reliable, reducing access to remote mine sites and northern communities. The NAP does not provide specific actions in the context of transport.[44]
- The US NAP, submitted in January 2025, consolidates strategies including the National Climate Resilience Framework (2023) and the Department of Transportation's 2024-2027 Climate Adaptation Plan (2024).[45] It highlights that a transition to a carbon-free, sustainable and resilient transport system leads to better air quality, fewer traffic fatalities, lower travel costs, improved mental and physical health, and healthier ecosystems. Adaptation actions by the transport department focus on incorporating resilience into grant and loan programmes, enhancing resilience in the project planning and development process, ensuring resilience of department facilities and operational assets, and improving climate education and research on resilience.[46]

In Oceania, six countries (Fiji, Kiribati, Marshall Islands, New Zealand, Papua New Guinea and Tonga) had submitted NAPs to the UNFCCC as of 1 August 2025; however, only three of these – Marshall Islands, New Zealand and Papua New Guinea – were new submissions between 2023 and mid-2025.[47]

- Marshall Islands' 2023 NAP emphasises careful design, construction and maintenance of public facilities – including roads and runways – to improve overall infrastructure resilience. It highlights the need for infrastructure planning that avoids negative impacts such as coastal erosion and pollution.[48]
- New Zealand's 2023 NAP commits to incorporating adaptation into decision making for investments in land transport. Nature-based solutions will be embedded to reduce transport emissions and increase the sector's adaptation capacity. Infrastructure improvements are planned for the rail network, public transport and active transport. The NAP also references the New Zealand Freight and Supply Chain Strategy, which is key to system-wide adaptation and resilience actions.[49]
- Papua New Guinea's 2023 NAP reiterates the country's NDC commitment to transport adaptation through the construction or rehabilitation of transport assets worth USD 1.2 billion (PGK 4.2 billion), in accordance with climate-resilient codes and standards. The plan includes conducting comprehensive risk and vulnerability assessments of inland and coastal road networks, as well as updating road design standards to account for climate change.[50]

Way forward for NAPs

In contrast to NDCs, very few resources exist for NAPs that provide tailored guidance on incorporating transport content into adaptation plans. Although the UNFCCC maintains a library of supplementary materials to support NAP development, very few focus on specific sectors or thematic areas.[51] Existing technical guidance covers health, information and communication technologies, agriculture, forestry and fisheries, migration, finance, and urban and human settlements; the latter includes several references to transport and its linkages to the SDGs and other sectors.[52]

As of August 2025, no dedicated guidance was available on transport and infrastructure within NAPs. Several transport-related guidance documents for NDCs address adaptation and resilience and can be applied to NAPs, as many of the general principles are shared (see Spotlight on Transport Ambition in NDCs 3.0). Additionally, a growing number of publications on transport adaptation and resilience have recently become available to policy makers, planners, and other national and local stakeholders (Table 1).[53]

Making adaptation and resilience efforts more consistent and effective will require maximising existing synergies between the elaboration and implementation of national transport policies, NAPs, the Sendai Framework for Disaster Risk Reduction, and SDG targets related to resilience and transport.[54]

TABLE 1. Recent publications on transport adaptation and resilience

Resource	Description
Adapting Public Transport to Climate Change: The Key for Resilient Cities (International Association of Public Transport – UITP)	This policy brief features a seven-stage climate adaptation framework to help organisations from the public transport sector consider climate risks, impacts, and practical adaptation measures to climate change. It includes case studies from Ireland, Singapore, Barcelona, Montreal and New York City as well as key recommendations to kick-start an organisation's adaptation journey.
Adapting Urban Transport to Climate Change (second edition) – SUTP Module 5f (GIZ)	This module is intended to raise awareness of the expected impacts of climate change on urban passenger transport – as well as possible adaptation measures – as transport decision makers in developing countries are confronted with extreme weather events such as flooding, sea-level rise and storms. These impacts are expected to increase with climate change, and the inability of transport systems to recover could result in exponential damages.
Climate-resilient Transport: A Policy Guide (High-Volume Transport Applied Research, developed under the leadership of the University of Birmingham)	This policy guide provides background and practical steps for developing, preparing and implementing adaptation plans for transport resilience to climate change. It is based on findings in a recent State of Knowledge report on Adaptation for Transport Resilience in Low-Income Countries in Africa and South Asia, and is targeted at policy makers in these regions. However, the guidance should be useful for all those involved in transport resilience.
Green Roads Tool Kit (Asian Development Bank)	This toolkit of good practices on sustainable roads provides a comprehensive collection of measures to guide the planning, construction and operation of road infrastructure. It outlines interventions and good practices across several dimensions, including climate resilience.
Infrastructure and Nature-Based Solutions Program (Global Center on Adaptation)	The programme has released several reports on resilient infrastructure, aimed at helping countries assess, plan and finance climate-resilient infrastructure investments.
Strengthening Freight Transport Resilience: A Climate Imperative for a +2°C World (Kuehne Climate Center)	The report proposes a practical framework for strengthening climate resilience across freight transport systems, centred around three pillars: 1) conducting climate risk assessments, 2) investing in best-in-class operational resilience and 3) strengthening the physical resilience of critical infrastructure.
Strengthening the Investment Case for Climate Adaptation: A Triple Dividend Approach (World Resources Institute)	This paper discusses using the Triple Dividend of Resilience framework to evaluate the full benefits of 320 climate adaptation investments and reveal their full value. Covering investments in 12 countries, the study finds that every USD 1 invested in adaptation can yield over USD 10.50 in benefits. With average returns of 20-27%, the analysis provides compelling evidence for scaling adaptation finance, improving data collection and appraisal methods, and unlocking synergies with mitigation.
Transport Resilience Financing, Resources and Opportunities (World Bank)	This report presents information on global financing facilities, public funds, and tax measures, offering valuable insights into financing transport resilience in low- and middle-income countries. It is intended to provide a clearer understanding of financing resources and associated challenges. The report highlights the need for a combination of innovative approaches, strategic partnerships, and diverse funding sources, as well as potential solutions to help bridge the gap in transport resilience financing and implementation.
Transport System Resilience (International Transport Forum)	The report draws on the deliberations of the ITF Roundtable on transport resilience and highlights three key insights: transport networks are vulnerable, disruptions have spillover effects, and resilience must be systematic.

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SPOTLIGHT

Assessing Progress: The Transport Decarbonisation Index

This spotlight is an excerpt from the High-Volume Transport Applied Research Programme on the Transport Decarbonisation Index (TDI)*, funded by UKAID through the UK Foreign, Commonwealth & Development Office. The TDI was developed by the SLOCAT Partnership, the Urban Electric Mobility Initiative, and individual experts Lewis Fulton, Pierpaolo Cazzola and Jacob Teter.*

Context, challenges and opportunities

A systemic transformation in transport and mobility is urgently needed, particularly in low- and middle-income countries across Sub-Saharan Africa and South Asia. In many countries, rapid population growth and urbanisation, rising private motorisation, and limited access to integrated transport systems are driving a surge in greenhouse gas emissions from surface transport, which are projected to outpace the global average in the coming decades.[1] Efforts to decarbonise transport must be balanced with the need to increase access to integrated transport systems that support connectivity, regional integration, economic growth, poverty reduction and inclusive communities in these countries.

The magnitude of the challenge is immense. In many low- and middle-income countries, data related to transport remain limited. This has hindered the capacity of policy makers to make informed policy and investment decisions and to effectively trace transport decarbonisation, access and resilience pathways that are aligned with countries' broader development and sustainability goals. Additionally, the limited technical capacity to develop bankable projects remains a key obstacle in attracting international climate investments to spur transport sector transformation. The core challenge for low- and middle-income countries lies not just in setting ambitious transport targets, but in tracking tangible progress. Robust transport assessments and indices are essential tools for informing effective policy and financing decisions in the systemic transformation of transport infrastructure, systems and services.

Against this backdrop, the Transport Decarbonisation Index (TDI) project seeks to support policy makers in low- and middle-income countries across Sub-Saharan Africa and South Asia in their efforts to reduce emissions from surface transport, while advancing broader sustainable development objectives.[2] The TDI aims to enable evidence-based, time-sensitive and targeted decisions on surface transport decarbonisation, by delivering a data-driven overview of where countries stand in their journey to net zero greenhouse gas emissions and complementing it with tailored, yet non-prescriptive, policy advice. The TDI project falls under the High-Volume Transport Applied Research Programme (HVT), funded by the UK Foreign, Commonwealth & Development Office.

If you can't measure it, you can't improve it

Without reliable benchmarks and tracking mechanisms, decarbonisation and sustainability efforts risk being fragmented, inefficient, or misaligned with long-term global and national goals. By providing comprehensive, data-driven insights into climate and sustainability trends, policy effectiveness, and investment gaps in the transport sector, transport assessments enable policy makers to design targeted interventions that maximise emission reductions, minimise the sector's negative externalities and deliver socio-economic benefits for society. They also help financial institutions and investors identify high-impact projects, de-risk investments and allocate resources more efficiently.

The TDI project's diagnostic toolkit allows policy makers to evaluate the current state of their country's transport sector, identify their respective strengths and gaps, and undertake high-impact policy and financing actions towards a decarbonisation pathway. More than a diagnostic tool, the TDI can act as a catalyst for knowledge sharing, partnership building, and collaborative learning, supporting low- and middle-income countries in aligning national policies with national and global climate and sustainability agendas.

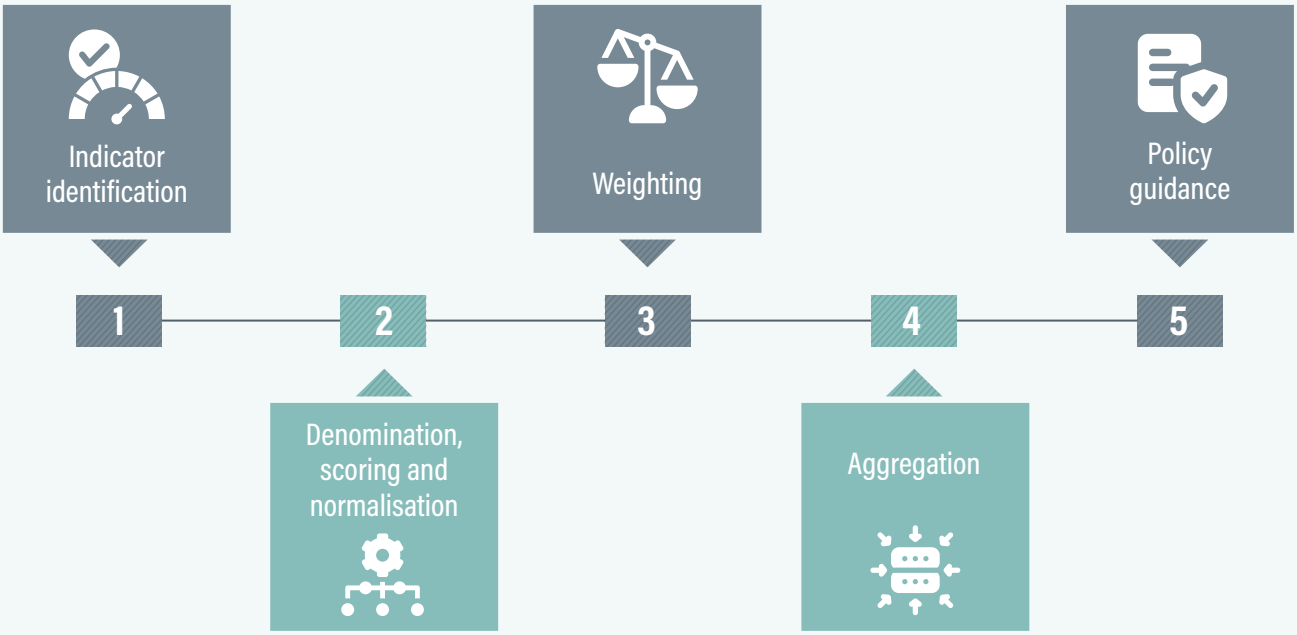
The TDI in a nutshell: methodology and toolkit

A clear methodology – including rigorous processes for indicator selection, normalisation, weighting and aggregation – is at the heart of any successful composite indicator system, with the TDI being no exception. The TDI methodology follows a comprehensive framework for assessing transport in low- and middle-income countries. It combines quantitative and qualitative aspects into relevant indicators to capture the complexity of transport systems, focusing on both current performance (e.g., emission levels) and future commitments (e.g., targets in Nationally Determined Contributions). The TDI's scope covers a range of surface transport modes – including road, rail and inland waterways – across both passenger and freight transport. The methodology is designed to balance robustness with flexibility, allowing application in countries that have varying data availability.

See the full TDI Methodology Report for a comprehensive overview of the methodology.[3]

The methodology of the TDI revolves around five main elements, which are common to any major composite indicator system (Figure 1).[4] **The index itself encompasses a broad range of indicators across eight dimensions, including passenger mobility, freight systems, finance and economics, governance, energy and context.** Based on the A-S-I-F (Activity-Structure-Intensity-Factor of emissions) framework, these dimensions reflect core elements of surface transport sustainability and decarbonisation.

FIGURE 1. The five elements of the TDI's methodological framework



Source: See endnote 4 for this section.

In selecting the indicators, a balance has been struck between the need for minimal coverage and pragmatism regarding data availability. Additionally, the selection has been guided by interpretability for user understanding and relevance for measuring progress towards net zero greenhouse gas emissions from surface transport, both within and across countries. Priority has been given to indicators from international databases, given their broad coverage and regular updates across the majority of low- and middle-income countries. However, restricting data collection, validation and scoring efforts to international databases carries the risk of excluding highly relevant indicators that are not systematically reported and collected globally.

Overcoming data gaps is crucial for the TDI. Proxies constitute one method for bridging gaps but should be used sparingly, with the underlying assumptions clearly stated. Importantly, the TDI can perform even if the data for some indicators are missing. (*For more on overcoming data limitations, see the TDI Benchmarking Report.*[5])

After the data are collected, the indicators are "normalised" to make them usable for aggregation. This begins with "denomination", which adjusts the indicators based on population to enable cross-country comparisons. Indicators that reflect extensive monetary values (e.g., fossil fuel subsidies) or physical quantities (e.g., paved road length) are denominated by the total population. In contrast, urban-specific metrics (e.g., rapid public transport) are denominated based on urban population size.

Once denominated, the indicators are "scored" either by using min-max scoring methods or "best-in-class" values or by grouping values into discrete bins. Scoring ensures comparability across different units of measurement, distributions, variances and scales. Following the scoring of the individual indicators, a second level of normalisation of the variables is added to ensure that they are on a common scale before aggregating them into composite values.

Weighting is a critical step in index development, often sparking debate over the optimal approach. The default weighting system of the TDI is equal weighting, attributing equal importance to each indicator within a dimension. This approach allows for automatic adjustment based on available indicators within dimensions and minimises bias towards certain aspects while enabling flexibility in cases where indicators are missing.

In the final step, the treated, denominated, normalised and weighted indicators are aggregated into final dimension scores. Specifically, the TDI shows the dimension scores derived from the sum of the normalised and weighted indicator scores for the indicators in each respective dimension. Thus, the aggregation indicates scores from 0 to 1 for the dimensions, with "1" constituting the best performance possible, whereas

"0" signals severe challenges in the context of transport sustainability and decarbonisation.

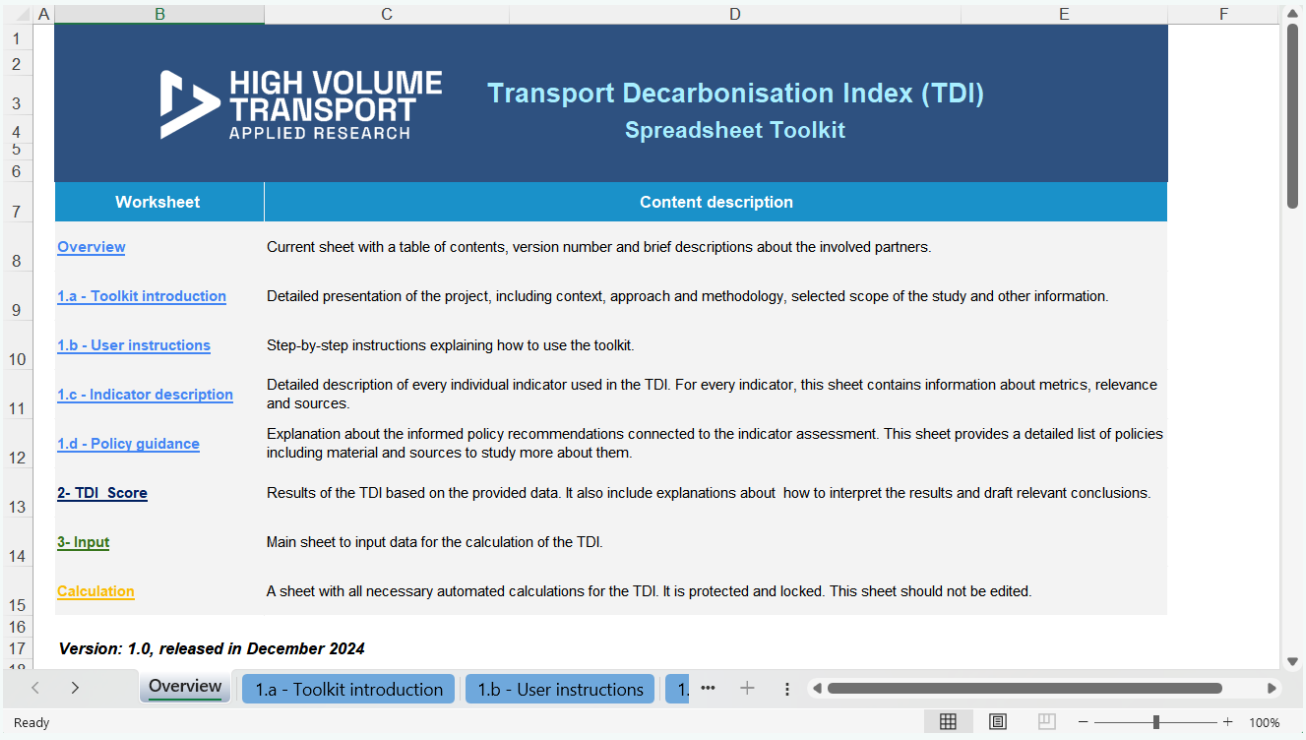
Each country is provided with illustrative and non-prescriptive advice in relation to its two lowest-scoring dimensions, with the intention of supporting evidence-based and informed policy making. These policy actions are to be regarded within the context of each country, accounting for characteristics linked to levels of development, the availability of natural resources, the presence of manufacturing capacity, and the existence of specific geographical characteristics, among others. To be impactful, policies require an enabling financial, political and institutional environment. The TDI is, therefore, not to be used in isolation but to be considered in parallel with a range of policy and financing instruments to effectively steer the sector on a low-carbon pathway.

To learn more about how to boost ambition for transport mitigation, adaptation and resilience in the third generation of Nationally Determined Contributions (NDCs 3.0), and how to facilitate the access of low- and middle-income countries to climate finance for transport, see the **Spotlight on Transport Ambition in NDCs 3.0** (**Module 2**) and the **Spotlight on Improving Access to Climate Finance for Transport in LMICs** (**Module 6**).

The TDI enables users to self-assess a country's transport system through the Spreadsheet Toolkit, which is provided in the form of an Excel file to enable broad accessibility for practitioners and policy makers in low- and middle-income countries. The toolkit and its dedicated user guide can be downloaded from the HVT website and used as a local file without an internet connection (see Figure 2 for a snapshot of the toolkit's webpage).[6] Upon inputting transport data on a specific sheet, users are provided with a score for the dimensions. The results are accompanied by explanations about the scores' meanings and corresponding policy guidance specifically for the two lowest-scoring dimensions.

A well-defined and user-friendly diagnostic toolkit is central to fostering the independent and widespread use of the TDI. Besides enabling transport assessments, the TDI is paramount in guiding users in interpreting the scoring results and their related policy recommendations. This is crucial to maximising the TDI's benefits for all user groups while safeguarding its effectiveness not only as a diagnostic tool, but also as a catalyst for knowledge sharing, partnership building and collaborative learning – supporting low- and middle-income countries in their efforts to transition to low-carbon, sustainable and resilient transport systems.

FIGURE 2. Snapshot of the Transport Decarbonisation Index (TDI) Spreadsheet Toolkit



Source: See endnote 6 for this section.

The TDI: a catalyst for knowledge sharing, partnership building and collaborative learning

Importantly, the TDI is designed not as a tool for casting blame or shaming countries that have lower scores; rather, it is a platform for mutual learning, collaboration and inspiration. By approaching a low score as an indicator of significant untapped decarbonisation potential, policy makers can make informed decisions regarding the policy and financing efforts that need prioritisation.

Countries can leverage the index to:

- address knowledge and capacity gaps
- build investor trust through transparency
- strengthen partnerships with financial and development institutions
- mobilise financial and technical support
- devise impactful policies for sustainable, low-carbon transport
- fast-track progress towards net zero emissions by 2050 by benchmarking against global pathways aligning to sustainability and decarbonisation goals, and
- improve public awareness and engagement.

These activities can help to implement global agendas at the national and sub-national levels, including the Paris Agreement and the 2030 Agenda for Sustainable Development. To realise the TDI's full potential, however, the dissemination of the index's scoring results would have to be tailored to the needs, knowledge and data literacy of its target audience. Here, the engagement of all relevant stakeholders – from policy makers to practitioners – at the outset will be key to ensure relevance and increase the sense of ownership among end users.

To learn more about the importance of and challenges to capacity building, see **6.2 Capacity Building for Transport Transformations** (**Module 6**).

Key findings from the TDI piloting and conceptualisation

The application and benchmarking of the TDI was carried out across 12 pilot countries, including 6 in Africa (Ethiopia, Ghana, Kenya, Nigeria, Rwanda, South Africa and Zimbabwe) and 6 in South Asia (Bangladesh, India, Nepal, Pakistan and Sri Lanka).

The piloting process demonstrated the importance of tailored transport assessments, underscoring both the potential and challenges in aligning national transport strategies with global decarbonisation and sustainability agendas. Although serving as a comparison tool is not the TDI's primary objective, the assessment of multiple countries offered a valuable opportunity to showcase the index's application. The results revealed substantial variability across countries in dimensions such as public transport investment, vehicle ownership, freight efficiency, emissions and clean energy. Despite this variability, some interesting observations can be drawn:

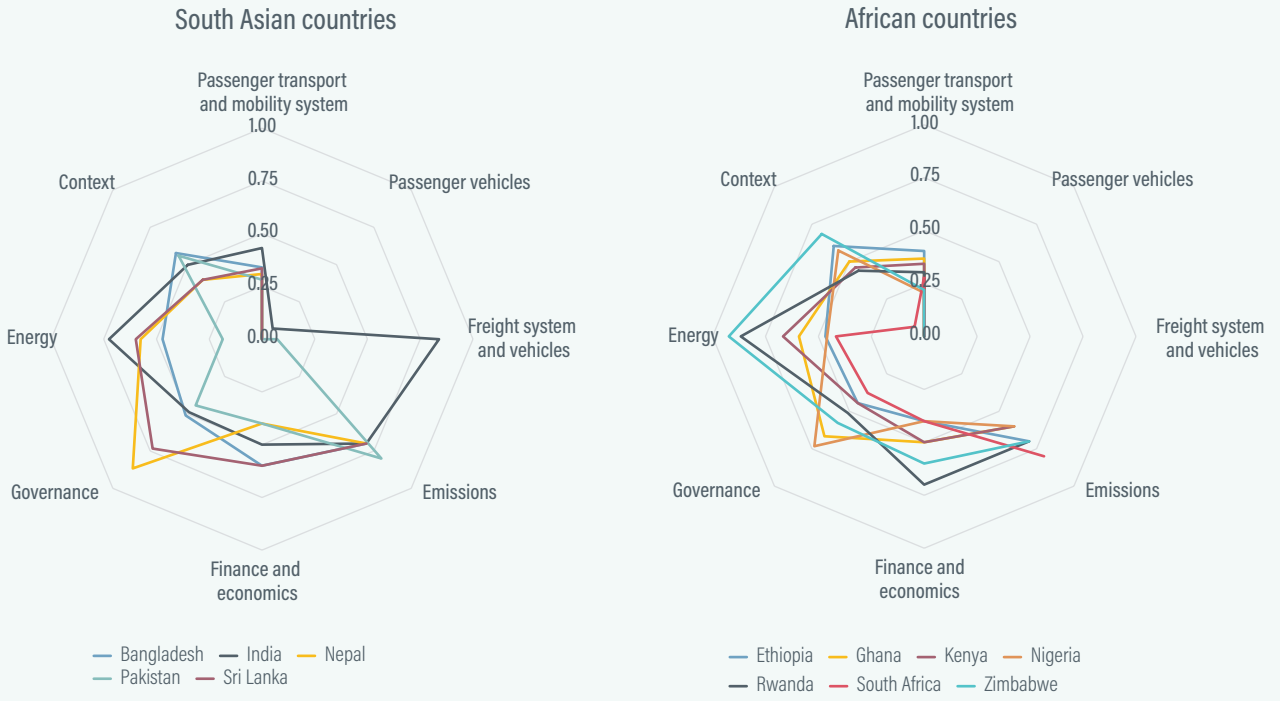
- The assessed countries provided **per capita fossil fuel subsidies** for petrol and diesel of between USD 17 and USD 180 in 2022; these levels were below global averages, resulting in higher TDI scores under the dimension "finance and economics".
- Lower TDI scores were observed in the pilot countries for the **availability of low-cost finance**, which refers to climate-related official development assistance (ODA). Although ODA data are not strictly limited to the transport sector, they offer a useful indication of potential financial support available for transport initiatives.
- Within the dimension "passenger transport and mobility system", data for the indicator of **walkability** (which relates to urban design and the proximity of residents to desired services and destinations) showed Nepal as the highest scoring country, with 77% of trips being walkable, whereas in Nigeria only 6% of trips are regarded as walkable.
- Sri Lanka demonstrated national best practice in **public transport investment** relative to other pilot countries, whereas India showed high scores on the indicator **policy strength of clean fuels** thanks to its high fuel quality standards.
- The majority of the 12 pilot countries examined through the TDI were marked by low baseline **transport carbon dioxide (CO_2) emissions**, with average per capita emissions of around 0.24 tonnes of CO_2 in 2022.
- Nearly all examined countries, except for South Africa, displayed extremely low levels of **private vehicle ownership**, reflecting room for further development of their transport systems.

- In Kenya, Nepal, and Nigeria, **renewables** accounted for more than 70% of total energy consumption in 2021; these were some of the highest values in the examined dataset, pointing to important opportunities to amplify the emission benefits of transport electrification.
- Overall, South Asian countries yielded homogeneous results across the dimensions of "passenger transport and mobility systems", "emissions" and "finance and economics" (Figure 3).[7] South Asian countries generally scored low in the "light-duty vehicles" dimension and in the "emissions" dimension, signalling comparable levels of growth and per capita emissions.
- In contrast, African countries displayed greater diversity in their results. South Africa stood out in the "context" dimension, with **road traffic fatalities** significantly higher than in other pilot countries.
- The policy guidance results for the two lowest-scoring dimensions revealed that African countries could prioritise policies and activities on **light-duty vehicles** and **passenger transport**. South Asian countries, on the other hand, could address context-related issues, including **air pollution** and **road safety**.

All in all, the results of the TDI application in the 12 pilot countries pointed to significant challenges linked to road traffic fatalities and air pollution-related mortality. Emission-related indicators scored relatively well across most countries, despite rapid growth in transport CO_2 emissions. Maintaining low emission baselines, however, will require co-ordinated efforts across all dimensions covered by the TDI.

For in-depth analysis of the results of the TDI application and benchmarking process across the 12 pilot countries, see the **TDI Benchmarking Report**.[8]

FIGURE 3. TDI dimension scores for pilot countries in South Asia and Africa



Higher score is better, which means:

The score ranges from 0 (lowest) to 1 (highest).
A higher score means that a country performs well for the dimension.

Source: See endnote 7 for this section.

Way forward and areas for improvement

The Transport Decarbonisation Index provides a critical framework for assessing and supporting low- and middle-income countries in their efforts to achieve sustainable and decarbonised transport systems, while supporting broader sustainable development objectives. Despite data challenges, the TDI has proven that it can be a valuable tool for benchmarking performance and informing policy decisions by offering a nuanced understanding of key transport dimensions such as emissions, governance, infrastructure and finance.

Notwithstanding, incorporating new elements into future iterations of the TDI could enhance the index's assessment results and its adoption among policy makers.

- First, **expanding the availability of TDI resources in multiple languages** beyond English would increase accessibility for a broader range of users. This would improve its usability among policy makers and practitioners in low- and middle-income countries, where language barriers may limit engagement. The success of the TDI will largely depend on its uptake by policy makers in the Global South.
- Second, **applying the TDI to a wider range of countries** across different regions would strengthen its indicator set and scoring methodology. The benchmarking of the TDI was focused on a small number of countries in two regions, making it difficult to establish robust thresholds for scoring country performance.
- Third, **a more sophisticated weighting approach** could be introduced if the TDI were tested across more countries, improving its practical application. Currently, the TDI employs an equal weighting system, treating all indicators within a dimension as equally important for the final dimension score.
- Fourth, the TDI would benefit from **greater efforts in data collection and sharing**. Despite prioritising indicators that have good data coverage across the pilot countries and relying on globally recognised databases with harmonised collection processes and annual updates, the application of the TDI faced significant data limitations. Such limitations make comprehensive transport assessments challenging.

The TDI's application in the pilot countries provided valuable insights into the type of data that need to be captured. It also underscored the **need for improvements in data collection and availability in low- and middle-income countries, with regional data analysis efforts holding great potential** to improve assessment and policy making in transport. The **Asian Transport Observatory (ATO)** was identified as a successful data resource for the Asia-Pacific region, serving as a potential model for replication in other data-limited regions such as Africa and Latin America. This effort could be supported by developing guidelines or toolkits to help countries improve transport data collection, reporting and management. Partnerships with international databases could help leverage existing data while encouraging countries to contribute more consistently.

- Fifth, future iterations of the TDI could be enhanced by **incorporating additional indicators**. With improved data availability, the TDI could include themes not currently covered, such as equity and informal transport. While maintaining its overall structure, additional indicators could refine the assessment. A TDI comparison incorporating a significantly broader coverage of aspects with adequate data availability can provide more accurate insights into countries' performance. Moreover, this can incentivise countries to gauge their own efforts to collect the needed data and put in place ongoing tracking efforts.
- Finally, future development could include **enhanced interactive elements (toolkit, visualisations and dashboards)**. With additional resources, an interactive online dashboard using R, Python or other coding languages could be developed and implemented, improving the TDI's accessibility and usability.

MODULE 2 | 2.3

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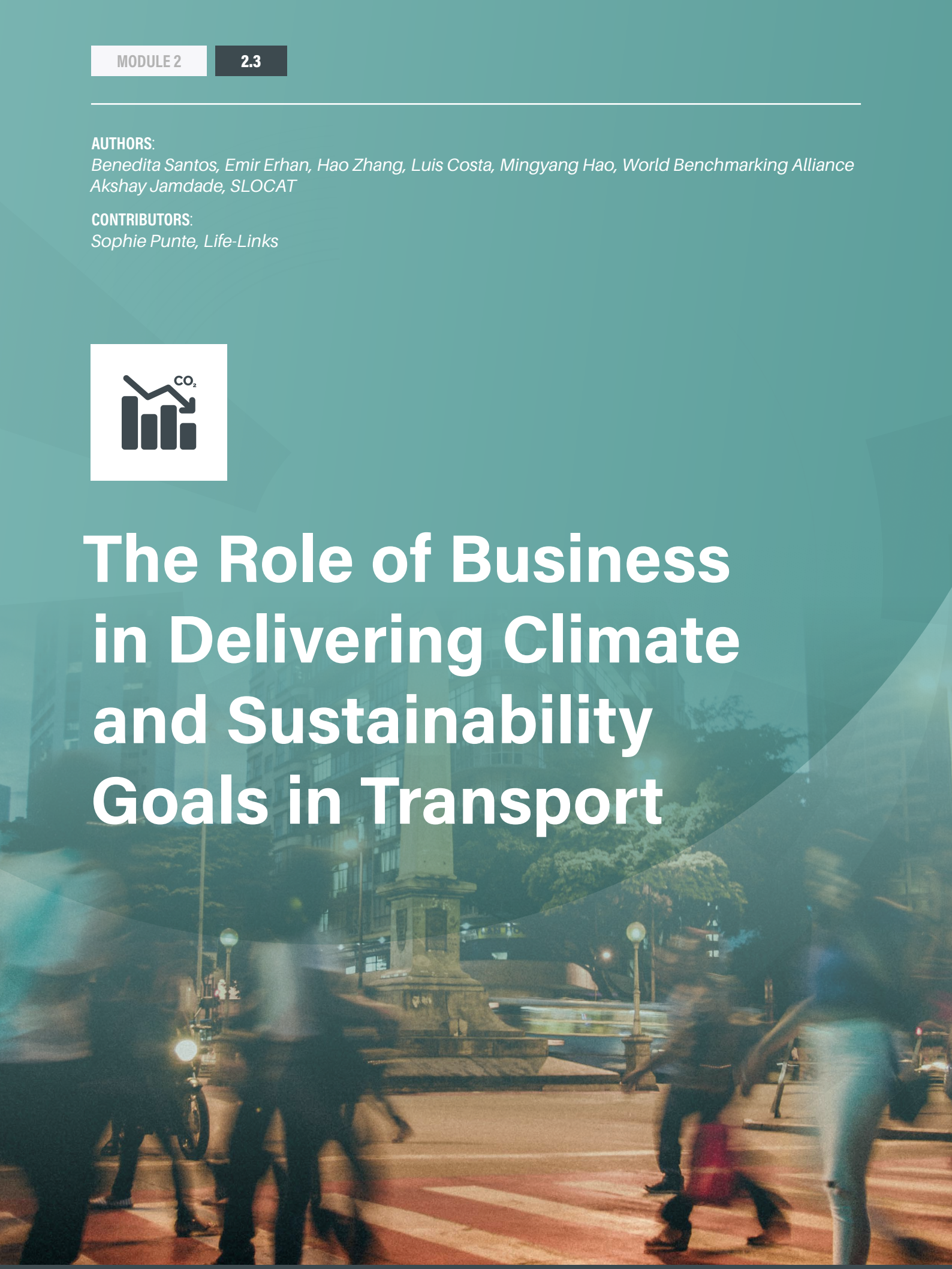
The Role of Business in Delivering Climate and Sustainability Goals in Transport



KEY FINDINGS

- Decarbonising the transport sector and making it more sustainable requires active participation from private sector actors, including manufacturers, transport service providers and operators, and companies that use transport. These actors play a central role in delivering technology, services and investment; evolving production and consumption patterns; and influencing travel patterns and transport services.

Ambition

- OEMs include manufacturers of vehicles, aircraft and marine/inland vessels as well as their engines, components and other equipment. This section draws on sustainability disclosures from 44 of the most influential transport manufacturers: 30 major global automotive companies, which accounted for 80% of global vehicle sales in 2023, and 14 manufacturers of aircraft, ships, trains and trucks/buses.
- Combined, the sold products of these manufacturers contributed just over half (52%) of global transport sector emissions in 2023. These 44 companies collectively generated USD 3.2 trillion in revenue and directly employed 5.5 million workers that year.
- In 2023, 7 out of 11 Chinese manufacturers assessed lacked emission reduction targets, and none addressed emissions from both manufacturing (Scopes 1 and 2) and product use (Scope 3), despite being leaders in electric vehicle development.
- Between 2021 and 2023, the auto industry made only mild improvements in the adoption of climate targets covering emissions from manufacturing (upstream, or Scope 1 and 2 emissions).
- As of 2023, 63% of automotive companies had committed to reducing emissions from manufacturing (direct and indirect). However, only half of companies disclosed sufficient detail to allow for a thorough evaluation of their alignment with the industry-specific pathway for limiting global warming to 1.5 °C.
- Meanwhile, target setting to reduce emissions from the use of sold vehicles (downstream, or Scope 3 emissions) stagnated between 2021 and 2023, impeding alignment with 1.5°C pathways. Scope 3 emissions often account for 75-80% of an automaker's total carbon footprint.
- As of 2023, only half of the most impactful auto companies have set targets for downstream emissions, underscoring the significant work needed to align with a 1.5°C pathway. Of these companies, only seven (23%) disclosed enough information for their targets to be assessed for alignment with a 1.5°C pathway.
- Aviation's path to net zero emissions by 2050 hinges on radical decarbonisation, with major manufacturers prioritising fleet renewals, operational efficiency, sustainable aviation fuels (SAF), and hydrogen, despite significant challenges related to infrastructure and scalability. Given aggressive delivery targets and the long operational lifetimes of aircraft, the industry's pathway to achieving net zero by 2050 is focused on decoupling growth from emissions, rather than capping it.
- Both Airbus and Boeing, which together account for around 89% of global new commercial aircraft deliveries, have aligned with the industry's 2050 net zero goal.
- The global shipping industry faces significant pressure to accelerate the adoption of zero-emission fuels and to address the critical gap in emission reduction across the value chain. The sector is on a trajectory to exhaust its proportional 1.5°C carbon budget by 2030, its 1.7°C budget by 2037 and its 2°C budget by 2047.
- Although several major shipbuilders have set targets to reduce manufacturing emissions (direct and indirect), none have set targets for reducing product emissions, which account for the bulk of emissions in the shipping industry.
- Rail manufacturers have adopted strong targets towards achieving net zero emissions. This includes using renewable energy sources and advancing technologies such as hydrogen and battery electric trains.

KEY FINDINGS

- Although OEMs increasingly reference their climate commitments, evidence suggests that these companies are responding to, rather than shaping, the market transition. This limited progress reflects a set of structural barriers.
- Transport service providers have demonstrated growing decarbonisation ambition, with targets across the entire value chain increasingly becoming the norm. Progress has been made in addressing Scope 1 and 2 (upstream) emissions, while Scope 3 (downstream) emission reductions remain a challenge.
- A growing number of public transport and freight transport operators have set targets for net zero greenhouse gas emissions to achieve carbon neutrality; in a few cases, these include short-term net zero targets within the decade.
- Third-party logistics providers have begun to set measurable decarbonisation targets, although ambitions are uneven across companies and are often limited to incremental goals or pilot geographies. Some actors have outlined long-term aspirations such as net zero emissions or reductions in emission intensity, but concrete commitments are largely focused on vehicle counts or modest emission cuts, with limited clarity on broader systemic transformation.

Action

- So far, it has not been common practice for auto manufacturers to make public financial commitments in support of their low-carbon transition plans. As of 2025, only seven auto manufacturers (representing 28% of total vehicle production) had committed to increasing their capital expenditure on low-carbon activities.
- Automakers have been scaling up and reshaping their financial strategies to meet the IEA's goal of 65% electric vehicle sales in total car sales by 2030, in line with net zero emission trajectories. As of 2022, electric car sales were broadly in line with a 1.5°C roadmap; however, the auto industry risked falling behind, given that no major manufacturer had pledged to fully phase out fossil fuel vehicle production by 2035.
- Even if all auto manufacturers fully achieve their publicly disclosed targets for phasing out fossil fuel vehicle production, and Chinese companies meet the national goal of 40% new energy vehicle sales, only around 38% of vehicles globally are projected to be fully electric by 2035 under current company plans.
- Alongside governments, major auto manufacturers have been investing in public charging infrastructure, which is key to supporting mass adoption of electric vehicles. Global charging infrastructure expanded more than 30% in 2024, adding more than 1.3 million public charging points.
- Although new-generation aircraft from Airbus and Boeing are already compatible with up to 50% SAF blends, the pace of SAF adoption has been constrained by under-investment from the energy sector, which has not scaled production fast enough to meet aviation's climate targets. In 2024, SAF production doubled to 1 million tonnes, yet it accounted for just 0.3% of global jet fuel output.
- The use of hydrogen-powered aircraft is still not a feasible business model. Although Airbus initially targeted 2035 for the entry into commercial service of a hydrogen-powered aircraft, it has postponed this goal to the late 2030s due to slower-than-expected technological advancements and infrastructure development.
- The current and projected uptake of zero-emission fuels in shipping – including ammonia, hydrogen and methanol – remains well below what is needed to meet Paris-aligned targets, based on a 2050 vision on fuel standards for shipping.
- Leading rail manufacturers are deploying a diversified portfolio of alternative propulsion systems. These include hydrogen fuel cell trains, battery electric trains and advanced hybrid models.
- Production shortfalls by aircraft and engine manufacturers have caused persistent supply chain delays. Record-high backlogs in aircraft deliveries were expected to continue into 2025, impacting airline performance by raising costs and limiting growth.
- Railway companies have increasingly embedded sustainability into their supply chains, with 73% including green clauses in supplier contracts and 63% monitoring the sustainability performance of suppliers as of 2022.
- Of the 1,061 transport service companies that disclosed targets to CDP in 2023, only one reported having all 21 key indicators of a Climate Transition Plan. Of the remaining companies, 10% (104 companies) had many of these indicators, 19% (202 companies) had some indicators, and 71% (754 companies) had few indicators.
- Third-party logistics providers are pursuing operational decarbonisation through combined strategies including vehicle electrification, alternative fuels, fuel-saving driver practices and digital tools.

KEY FINDINGS

Advocacy

- The advocacy and policy positions of leading global auto manufacturers have posed a significant obstacle to operationalising climate-friendly policies in the industry. Many companies have supported policies favouring internal combustion engine (ICE) vehicles. The resistance to stricter vehicle emission standards and accelerated ICE phase-out policies have been compounded by factory closures and job losses. The EU has partially rolled back its vehicle emission and ICE phase-out targets following industry pushback and trade tariff tensions with the United States.
- As of 2023, 60% of auto industry players had not disclosed how they govern their relationships with trade alliances, associations, coalitions and think tanks – influential parties through which companies can indirectly influence climate-related policy.
- Overall, as of 2023, 63% of the automotive industry disclosed public support for significant climate policies, including a commitment to the Paris Agreement; however, only 37% of industry players had a monitoring and reviewing process to ensure that their policy positions aligned with the Paris goals.
- Beyond the auto industry, most other transport manufacturers have shown limited corporate policy engagement, with few signs of active participation in associations or coalitions.
- The International Civil Aviation Organisation (ICAO) has agreed on a methodology for monitoring and reporting emissions in the sector, including stricter standards for CO_2 and non-CO_2 emissions. Both Airbus and Boeing have expressed alignment with low-carbon goals and have publicly supported and committed to the principles of the Paris Agreement; however, neither company has specified a monitoring and review process to ensure that its policies are aligned.
- In 2025, the IMO adopted the first legally binding Net-Zero GHG framework for global shipping, aligning the sector with the Paris Agreement. While some shipping companies engage in climate actions, most have yet to address concerns about policy engagement with outside groups.
- All rail or rolling stock manufacturers have demonstrated some involvement with national and sub-national authorities to test or implement climate-related policies and partnerships; however, no manufacturers are entirely aligned with a low-carbon pathway.
- Global and regional advocacy coalitions have emerged in recent years. Cross-company coalitions such as EV100+, the First Movers Coalition (FMC), and the Zero Emission Leadership Coalition show promise, but they remain concentrated in major economies and sectors, with limited participation from emerging markets or smaller companies. These coalitions risk becoming echo chambers for large multi-national players unless they expand to include a broader diversity of actors, such as small carriers, logistics providers, and public transport authorities, particularly from low- and middle-income countries.

Accountability

- Climate disclosures have become mainstream in the transport sector, yet critical accountability gaps remain – particularly in the reporting of Scope 3 emissions and the adoption of robust interim targets. To drive progress, companies must enhance their disclosure of emissions (including Scope 3), set emission reduction targets, increase the transparency of R&D and develop comprehensive transition plans.
- The aviation industry has sought to adopt best practices for globally recognised accounting systems for SAF uptake (regardless of uplift location), with the goal of facilitating economies of scale in SAF production.
- The global finance portfolio for shipping has aligned increasingly with the ambitious decarbonisation goals of the IMO, according to a 2024 disclosure report under the Poseidon Principles.
- Since 2022, to enhance transparency, signatories of the Poseidon Principles have disclosed the share of their portfolio used to calculate climate alignment – known as the reporting percentage. The average reporting percentage rose from 91% in 2022 to 93.3% in 2024, with 80% of signatories disclosing reporting percentages of more than 90% and eight achieving full (100%) reporting.
- Although target setting has improved for transport service providers and operators – with more companies now publishing science-aligned or time-bound climate targets – verification has remained questionable. Between 2023 and 30 July 2025, 233 transport companies joined the Science Based Targets initiative (SBTi); of these, 51% (119 companies) had set net zero targets, and 49% (114) had committed to net zero targets.

KEY FINDINGS

- Companies increasingly mention Scope 3 emissions, yet few offer detailed disclosures or breakdowns. The risk of overstated environmental claims remains significant. In the aviation sector, companies often highlight biofuels and optimisation even as SAF use remains very low. Major blind spots in accountability include emissions from supply chains, infrastructure, vehicle manufacturing and embedded energy in fuels. Many transport companies claim future decarbonisation while continuing to expand routes, fleets and hubs.

The "4 A's" across companies that use transport

- Companies engage in transport both through their own fleets and by using public and freight services provided by third parties.
- These actors shape the transport space by leveraging their purchasing power to demand zero-emission transport services, sustainable fuels, and clean infrastructure, thereby influencing market dynamics and policy directions.
- Despite some progress and the setting of diversity targets, private sector players in transport have lagged in achieving meaningful gender representation.

Challenges and opportunities for decarbonising private transport

- Stable, forward-looking regulation presents a vital opportunity for the private sector to lead the transformation towards net zero emissions in the road transport sector. Regulatory clarity can stimulate investment in low-emission technologies, encourage innovation and create competitive advantages for first movers. However, recent significant opposition within the automotive, petrochemical and affiliated industries has diluted or delayed climate policies in key jurisdictions, undermining this potential.
- Rather than opposing reform, businesses stand to gain by actively engaging in the regulatory process and leading on solutions. Constructive partnerships between government and the private sector will be essential to ensure that policies are not only ambitious and credible but also practical and supportive of innovation. This is not merely a compliance challenge – it is a commercial opportunity to shape the future of mobility and to lead the low-carbon transition in a way that is profitable, inclusive and forward-looking.
- Digital payment platforms such as Mastercard and Visa present an opportunity to accelerate decarbonisation across transport systems, particularly in first- and last-mile connectivity.
- Newer OEMs that do not have legacy platforms based on ICE technologies are uniquely positioned because they are not constrained by fossil fuel phase-out targets and can instead focus on achieving full life-cycle sustainability from the outset. However, real progress towards decarbonisation will depend on whether the transition strategies of these manufacturers are time-bound, financially viable and focused on aligning core business functions (including capital expenditure and R&D) with low-carbon technologies, such as battery manufacturing and charging infrastructure.

Overview

Decarbonising the transport sector and making it more sustainable requires active participation from private sector actors, including manufactures, transport service providers and operators, and companies that use transport. These actors play a central role in delivering technology, services and investment; evolving production and consumption patterns; and influencing travel patterns and transport services. It is crucial to understand private sector involvement in the transport system and the ecosystem of transport stakeholders, as the relationships among them are complex and interdependent (Figure 1).

Business actors play an important role in advancing sustainable transport. They can be divided into three main categories:

- **Original Equipment Manufacturers (OEMs)** – entities that design, manufacture and assemble transport vehicles for both passenger and freight transport (disaggregated by the automotive industry, rail, aviation and shipping).
- **Transport Service Providers and Operators** – entities that deliver or manage passenger and freight transport services that use vehicles, aircrafts, or vessels, including freight carriers, public transport operators and logistics companies.
- **Companies That Use Transport** – companies that engage in transport both through their own fleets and by using public and freight services provided by third parties.

The contributions of these business actors are evaluated here using the "4 A's of Climate Leadership": Ambition, Action, Advocacy and Accountability (Figure 2).[1] This framework was developed by the We Mean Business Coalition, which works with thousands of companies and partners to drive action towards net zero greenhouse gas emissions, in line with a pathway to keep average global temperature rise below 1.5 degrees Celsius (°C).[2] Using the 4 A's of Climate Leadership, leading transport businesses respond to the climate crisis through:

FIGURE 1. Relationships among private sector actors in the transport system

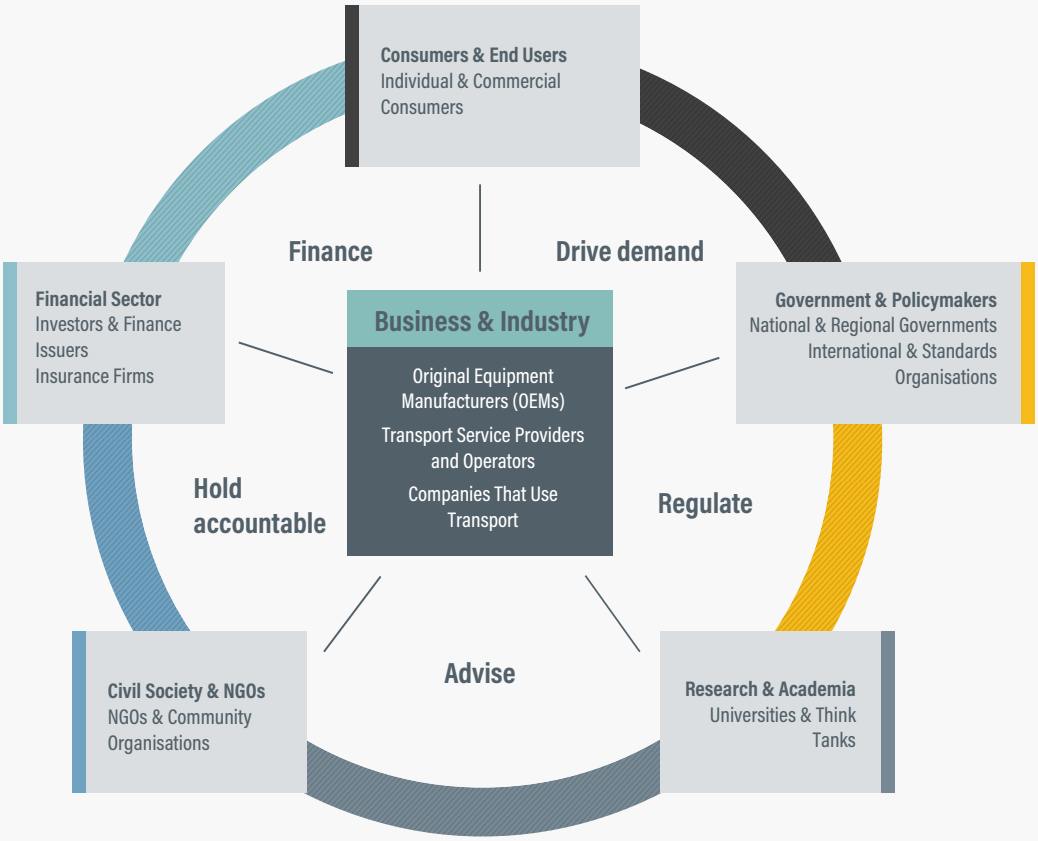
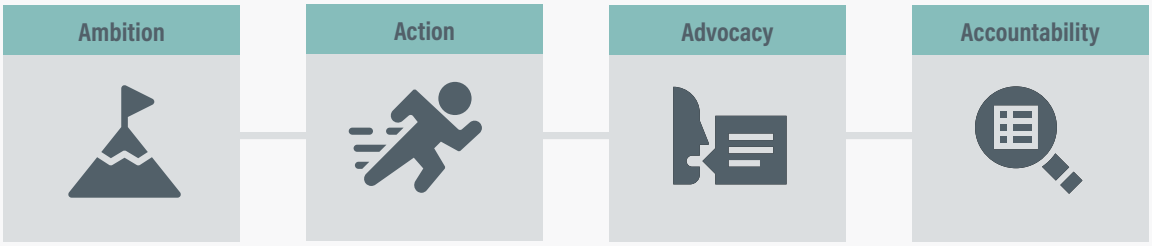


FIGURE 2. The 4 A's of Climate Leadership



- **Ambition**, by setting a clear, positive vision and plan for a net zero future.
- **Action**, by delivering on that vision with innovation and transformation.
- **Advocacy**, by using their influence to promote strong, science-based climate policy.
- **Accountability**, by transparently disclosing progress, risks and strategies to build trust and drive impact.

Understanding the challenges and opportunities businesses face in meeting global climate and sustainability goals enhances the potential to advance progress in these critical areas.

Box 1. Key concepts

Emission scopes

- **Scope 1** – direct emissions from sources owned or controlled by a company, including on-site fuel use, company vehicles and industrial processes (e.g., fuel burned by company vehicles or aircraft).
- **Scope 2** – indirect emissions from the generation of purchased energy consumed by the company (e.g., electricity, heating and cooling, steam for operating vehicles).
- **Scope 3** – all other indirect emissions across the value chain, such as fuel production, purchased goods, waste, business travel, and use of sold services or products.
  - For OEMs, Scope 3 emissions include upstream emissions (e.g., producing raw materials and manufacturing components) and downstream emissions (e.g., emissions from vehicles during the vehicle's entire lifespan).
  - For service providers and operators, and companies that use transport, Scope 3 can include outsourced transport or leased assets.

Upstream and downstream emissions (both part of Scope 3 emissions)

- **Upstream emissions** occur before the company's actual operations (e.g., supply chain activities, mining activities).
  - For OEMs, upstream emissions include emission from raw materials etc.
  - For transport service providers, upstream emissions include emissions from vehicle manufacturing, etc.
- **Downstream emissions** result from after company's operations
  - For OEMs, emissions are from during operation or use of vehicle (fuel burned, or electricity used, etc.).
  - For transport service providers, emissions from activities like operation of vehicles they lease out to other companies, emissions generated by any franchise partners, etc.

Key platforms

- **Carbon Disclosure Project (CDP)** – a global platform for companies to disclose environmental performance, including transport-related emissions.
- **Science Based Targets initiative (SBTi)** – assesses whether corporate climate targets align with science-based decarbonisation pathways, including transport sector benchmarks.

Source: See endnote 3 for this section.

Ambition

OEMs

Original equipment manufacturers (OEMs) include manufacturers of vehicles, aircraft and marine/inland vessels as well as their engines, components and other equipment.[4] This section draws on sustainability disclosures from 44 of the most influential transport manufacturers: 30 major global automotive companies, which accounted for 80% of global vehicle sales in 2023, and 14 manufacturers of aircraft, ships, trains and trucks/buses.[5]

Combined, the sold products of these manufacturers contributed just over half (52%) of global transport sector emissions in 2023.[6] These 44 companies collectively generated USD 3.2 trillion in revenue and directly employed 5.5 million workers that year.[7] The following sections provide a detailed analysis, based on their sustainability disclosures, of how these manufacturers are addressing the individual components of the 4 A's of Climate Leadership.[8]

Automotive

Road vehicles emit the highest share of greenhouse gases among all transport modes and were responsible for nearly three-quarters (74%) of the world's transport greenhouse gas emissions in 2023.[9]

The major traditional auto manufacturers have shown varying ambition in setting targets to reduce their emissions, with some influential companies not committing to any specific emission reductions. The industry has continued to fall short. This is especially concerning given that, in line with the International Energy Agency's (IEA) Net Zero scenario and the Accelerate Climate Transition (ACT) benchmarking methodology, companies were expected to adopt ambitious targets (to reduce their direct emissions) 10 years after the Paris Agreement.[10] Greater disclosure and accountability across all scopes of emissions (Scope 1, 2 and 3) – including those from supply chains – will be essential to ensure that manufacturers' targets translate into real emission reductions and meaningful climate actions.

- **In 2023, 7 out of 11 Chinese manufacturers assessed lacked emission reduction targets, and none addressed emissions from both manufacturing (Scopes 1 and 2) and product use (Scope 3), despite being leaders in electric vehicle development.**[11]
- Although 60% of auto manufacturers have set targets for net zero greenhouse gas emissions, only two – Mercedes-Benz and Tata Motors – aim for net zero across all emissions prior to 2040.[12]
- Notably, no company's net zero targets align with the IEA's recommended time frame for achieving net zero greenhouse gas emissions.[13]

Between 2021 and 2023, the auto industry made only mild improvements in the adoption of climate targets covering emissions from manufacturing (upstream, or Scope 1 and 2 emissions) (Figure 3).[14]

- **As of 2023, 63% of automotive companies had committed to reducing emissions from manufacturing (direct and indirect).**[15]
- **However, only half of companies disclosed sufficient detail to allow for a thorough evaluation of their alignment with the industry-specific pathway for limiting global warming to 1.5 °C.**[16]
- Dutch automaker Stellantis was the only company with both near- and long-term targets for manufacturing emissions, aligned with its 1.5°C pathway.[17]

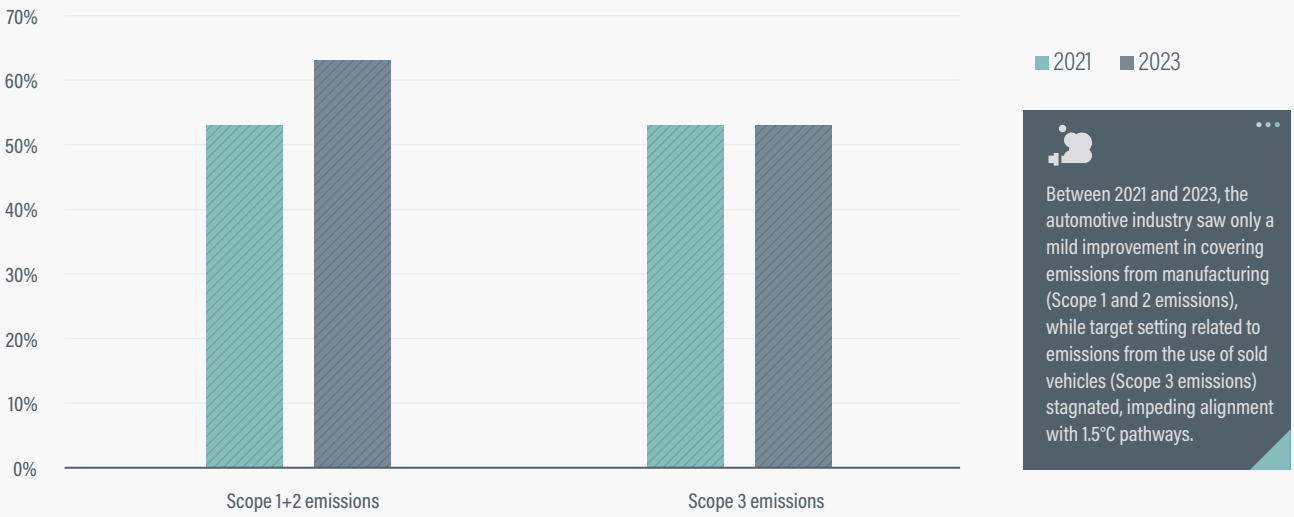
Meanwhile, target setting to reduce emissions from the use of sold vehicles (downstream, or Scope 3 emissions) stagnated between 2021 and 2023 (Figure 3), impeding alignment with 1.5°C pathways.[18] **Scope 3 emissions often account for 75-80% of an automaker's total carbon footprint.**[19]

- **As of 2023, only half of the most impactful auto companies have set targets for downstream emissions (Table 1), underscoring the significant work needed to align with a 1.5°C pathway.**[20]
- **Of these companies, only seven (23%) disclosed enough information for their targets to be assessed for alignment with a 1.5°C pathway.**[21]

Many manufacturers of heavy-duty vehicles have set long-term emission reduction goals; however, the lack of concrete near-term actions or foundational strategies by most highlights a critical challenge in pivoting to zero-emission vehicles.[22] **Target setting for reducing manufacturing emissions from heavy-duty vehicles is greatly influenced by stricter regulations.** With binding heavy-duty vehicle regulations on the horizon in the EU and new US tailpipe standards, stronger legislative pressure will be essential to match manufacturers' climate ambitions with Paris-aligned pathways.[23]

- Among the top 18 heavy-duty vehicle manufacturers globally[i], European manufacturers are generally committed to reducing manufacturing emissions, with

FIGURE 3. Share of automakers setting reduction targets for Scope 1, 2, and 3 emissions, 2021 and 2023



Source: See endnote 14 for this section.

i The 18 companies are: Volvo Group (Sweden), Daimler AG (Germany) PACCAR Inc. (United States) MAN SE (Germany), Tata Motors (India), Ashok Leyland (India), BharatBenz (India), Eicher Motors Limited (India), Ford Motor Company (United States), General Motors (United States), Scania AB (Sweden), Hyundai Motor (Republic of Korea), Dongfeng Motor Corporation (China), Shaanxi Automobile Group (China), CNHTC (China National Heavy Duty Truck Group) (China), FAW Group (China), Isuzu Motors (Japan) and Volkswagen Truck & Bus (Germany).

TABLE 1. Commitment to downstream emission targets by major auto manufacturers, as of 2023

Manufacturer	Commitment by 2030/2035 for downstream emissions
BMW	50% average emission reduction in the use phase of the vehicle (product use emissions) per kilometre driven, compared to 2019
Honda	27% reduction in the carbon dioxide (CO_2) emission intensity of product use, compared to 2020
Mercedes	15% reduction in product use emissions in absolute terms by 2030, compared to 2019
Renault	35% reduction in CO_2 equivalent emissions (well-to-wheel) per vehicle worldwide
Toyota Motor Company	50% reduction in greenhouse gas emissions from new vehicles, compared to 2019
Volkswagen AG	30% fewer CO_2 emissions on average per vehicle (passenger cars and light commercial vehicles) over the entire life cycle by 2030, compared to 2018. The targets are to be achieved through pure CO_2 reduction.

Source: See endnote 20 for this section.

Volvo targeting a 50% reduction by 2030 (2019 baseline), Scania 50% by 2025 (2015 baseline) and Daimler 43% by 2030 (2018 baseline).[24]

- Among the 18 top manufacturers of heavy-duty vehicles, only two firms from the EU (European Union) – Scania AB and Volkswagen Truck & Bus – set near-term manufacturing emission targets.[25]
- In the United States, Ford (2017 baseline) and General Motors (2018 baseline) announced manufacturing emissions cuts of 76% and 72%, respectively, by 2035.[26]

Aviation

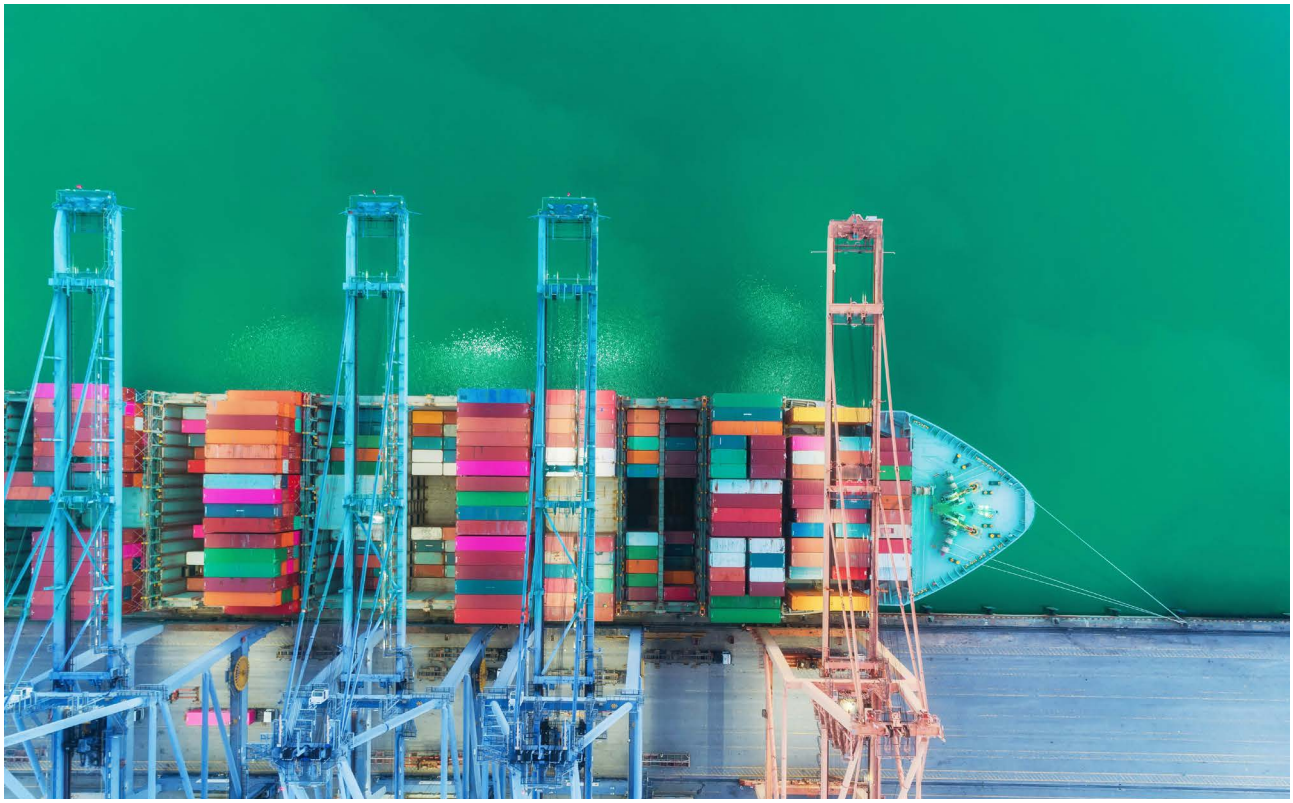
The aviation sector (domestic and international) was responsible for 11% of global transport greenhouse gas emissions in 2023.[27] More than 95% of the emissions from aircraft manufacturers originate from the use of their products (planes).[28]

Aviation's path to net zero emissions by 2050 hinges on radical decarbonisation, with major manufacturers prioritising fleet renewals, operational efficiency, sustainable aviation fuels (SAF), and hydrogen, despite significant challenges related to infrastructure and scalability.[29] Given aggressive delivery targets and the long operational lifetimes of aircraft, the industry's pathway to achieving net zero by 2050 is focused on decoupling growth from emissions, rather than capping it.[30]

Both Airbus and Boeing, which together account for around 89% of global new commercial aircraft deliveries, have aligned with the industry's 2050 net zero goal.[31] Airbus has set a target to reduce its manufacturing emissions 63% by 2030 (from 2015 levels), and cuts in these emissions are on track with the company's 1.5°C pathway.[32] Boeing has set a target to reduce its manufacturing emissions 55% by 2030 (below 2017 levels) and aims for 100% renewable electricity use by 2030.[33]

- Airbus aims to reduce its emissions from sold products per passenger-kilometre 46% by 2035 (below 2015 levels).[34]
- Airbus's efforts are underpinned by a comprehensive low-carbon transition plan and technological innovation (e.g., the ZEROe project and 100% SAF compatibility by the late 2020s).[35]
- Although Boeing's manufacturing emissions have decreased, the company lacks targets for its sold product emissions, which grew 84% between 2020 and 2023.[36]
- Before resorting to carbon offsets, Boeing plans to adopt an "avoid first, remove second" approach to prioritise the direct elimination of emissions through fleet renewal, operational efficiency and SAF.[37]

Sustainable aviation fuel is the most direct near-term option for decreasing the lifetime emissions from new aircraft fleets. SAF requires few changes to aircraft engines and fuelling infrastructure and can power flights with no distance limits. However, expanding the feedstock for SAF production can lead to deforestation or the conversion of carbon-rich ecosystems, undermining the climate benefits.[38] (See 4.9 Aviation.)



Shipping

Domestic and international shipping was responsible for 11% of global transport greenhouse gas emissions in 2023.[39] The International Maritime Organization's (IMO) 2023 GHG Strategy's aims to reduce the total annual greenhouse gas emissions from international shipping 20-30% by 2030 and 70-80% by 2040 (compared to 2008 levels), on a path to net zero emissions by or near 2050.[40]

The global shipping industry faces significant pressure to accelerate the adoption of zero-emission fuels and to address the critical gap in emission reduction across the value chain. The sector is on a trajectory to exhaust its proportional 1.5°C carbon budget by 2030, its 1.7°C budget by 2037 and its 2°C budget by 2047.[41] (See 4.10 Shipping.)

Although several major shipbuilders have set targets to reduce manufacturing emissions (direct and indirect), none have set targets for reducing product emissions, which account for the bulk of emissions in the shipping industry.[42] Manufacturers are under pressure to accelerate the production of ships that are compatible with zero-emission fuels (e.g., hydrogen, ammonia), as the sector is not on track to meet the target of 5-10% zero-emission fuel use by 2030.[43]

- China's state-owned conglomerate CSSC holds 21.5% of the global shipbuilding market but has yet to set any targets for direct or indirect product emissions.[44]
- Italy's Fincantieri has a scenario-tested transition plan targeting 20% emission reduction by 2030.[45]
- Hanwha in the Republic of Korea aims for carbon neutrality by 2050 by investing in onboard carbon capture and alternative fuels (e.g., liquefied natural gas, ammonia).[46]
- Korea Shipbuilding & Offshore Engineering (KSOE) plans to reduce its emissions 28% by 2030 and 60% by 2040, with the goal of carbon neutrality by 2050.[47]

Rail

Rail contributed only around 1% of global transport greenhouse gas emissions in 2023.[48] **Rail manufacturers have adopted strong targets towards achieving net zero emissions** (Table 2).[49] **This includes using renewable energy sources and advancing technologies such as hydrogen and battery electric trains.**

- Alstom, Hitachi Rail, Siemens Mobility and Stadler Rail have all committed to net zero targets through the adoption of renewables and advancements in alternative propulsion technologies, particularly hydrogen and battery electric trains.[50] These four companies consistently provide highly specific, SBTi-validated targets across all emission scopes, along with detailed operational and product-level initiatives.
- In contrast, CRRC and CAF, while expressing commitment to sustainability, have sometimes offered less granular or externally validated short-term targets, especially for product emissions.[51]

TABLE 2. Net zero targets and SBTi status of global rail manufacturers

Company (location of headquarters)	**Net zero target year**	**SBTi validation status**	**Scope 1 and 2 emission reduction targets** (year, % reduction, baseline)	**Scope 3 emission reduction targets** (year, % reduction, baseline)	**Key strategic pillars**
Alstom SA (France)	2050	Validated (July 2023)	40% by FY2030/31 (2021/22 baseline)	Passenger rolling stock: 42% per passenger-kilometre by FY2030/31 (2021/22 baseline); freight: 35% per tonne-kilometre by FY2030/31 (2021/22 baseline); purchased goods/services and transport and distribution: 30% by 2030/31 (2022/23 baseline)	Moving towards net zero mobility, responsible value chain
Siemens Mobility (Germany)	2050	Validated (implied by 2030 targets)	90% by 2030 (2023 baseline)	20% supply chain by 2030; 30% absolute by 2030; 90% absolute by 2050	DEGREE framework (Decarbonisation, Ethics, Equity, Governance, Resource Efficiency, Employability)
Stadler Rail (Switzerland)	2050	In progress (SBTi joined, plan in development)	Halve by 2030 (2022 baseline)	Recording started in 2024, targets to be set	Innovation leader in sustainable vehicles, resource efficiency, social commitment
Hitachi Rail (United Kingdom)	2050	Validated (implied by 2030 targets)	100% by 2030 (absolute)	40% by 2030 (absolute)	Drive modal shift, accelerate rail decarbonisation, decarbonise own operations
CAF (Spain)	2045	In progress (SBTi technical validation)	Not explicitly detailed/ quantified	Significant portion from Scope 3 (11.3 million kilograms CO_2 equivalent in 2023)	Developing sustainable transport solutions, leading net zero mobility, Railsponsible Climate Pledge
CRRC (China)	Not explicitly stated	Not disclosed (No explicit SBTi validation mentioned)	Not explicitly detailed/ quantified	Not explicitly detailed/quantified	Focus on "green CRRC" and national plans, high-quality products/services, AI+ initiative, world-class Enterprise Incubation Program

Source: See endnote 49 for this section.

Box 2. The missing momentum and leadership of OEMs in decarbonisation

Although OEMs increasingly reference their climate commitments, evidence suggests that these companies are responding to, rather than shaping, the market transition. With the partial exception of electric vehicles, where cost parity and market readiness are driving uptake, OEMs remain reluctant to take the lead on other low-carbon technologies, such as SAF and zero-emission shipping. Most manufacturers indicate plans to scale up these solutions only once they become commercially viable relative to fossil fuel alternatives.

This limited progress reflects a set of structural barriers:

- Core business models remain dependent on internal combustion engine technologies, creating resistance to transition due to risks to existing revenue streams.
- In several jurisdictions, climate-related regulations and policies have been weakened, delayed or withdrawn – creating uncertainty – often under lobbying pressure from OEMs and the fossil fuel industry.
- Consumers and corporate clients remain largely unwilling to bear higher costs, limiting the demand signals that could incentivise early action.

These conditions risk undermining the efforts of other actors such as investors, start-ups and civil society organisations that are working actively to accelerate the transition.

Transport service providers and operators

Transport service providers and operators include companies that provide transport services – such as taxi services and bus, rail and ferry operators – as well as companies that operate transport systems for public and freight movement, including road, rail, water and air transport operators.[52]

Transport service providers have demonstrated growing decarbonisation ambition, with targets across the entire value chain increasingly becoming the norm. Progress has been made in addressing Scope 1 and 2 (upstream) emissions, while Scope 3 (downstream) emission reductions remain a challenge.

A growing number of public transport and freight transport operators have set targets for net zero greenhouse gas emissions to achieve carbon neutrality; in a few cases, these include short-term net zero targets within the decade.

- Bibby Marine has committed to becoming the United Kingdom's cleanest and most dedicated operator of Service Operation Vessels (SOVs), aiming to deploy a zero-emission SOV by 2030.[53]
- Among its goals for 2030, shipping company DHL is aiming for 66% electric vehicles in its last-mile fleet and a 30% SAF blend.[54]
- Hitachi Rail aims for net zero emissions by 2050, with an intermediate goal of carbon neutrality by 2030 in operations.[55]
- Global port developer Hutchinson Port has committed to a 54.6% reduction in Scope 1 and 2 emissions and a 32.5% reduction in Scope 3 emissions by 2033, aiming for a 90% reduction in all three by 2050.[56]
- Swiss Post has committed to net zero emissions by 2040 across its entire value chain.[57]

Third-party logistics providers have begun to set measurable decarbonisation targets, although ambitions are uneven across companies and are often limited to incremental goals or pilot geographies. Some actors have outlined long-term aspirations such as net zero emissions or reductions in emission intensity[ii], but concrete commitments are largely focused on vehicle counts or modest emission cuts, with limited clarity on broader systemic transformation.

- The freight logistics company 20Cube, based in Singapore, has an ambitious target of carbon neutrality for Scope 1 and 2 emissions by 2026, and for Scope 3 emissions by 2035.[58]
- Amazon has committed to net zero carbon emissions across its global operations by 2040.[59] It aims to have 100,000 electric delivery vans on the road by 2030, sourced from Rivian and other manufacturers.[60] Amazon set a regional target to deploy 10,000 electric vehicles in India by 2025 and achieved it a year early, in 2024.[61]
- GXO France, under the EVE Programme (a voluntary public-private environmental initiative in France), committed to reduce the carbon footprint of its fleet (both owned and subcontracted) 5% by end-2024, compared to 2021 levels.[62]
- J.B. Hunt aims to reduce its carbon emissions intensity 32% below 2019 levels by 2034.[63]

Action

OEMs

Automotive

So far, it has not been common practice for auto manufacturers to make public financial commitments in support of their low-carbon transition plans. As of 2025, only seven auto manufacturers (representing 28% of total vehicle production) had committed to increasing their capital expenditure on low-carbon activities.[64]

- For 15 (50%) of the companies assessed in 2023, no evidence was found of quantified financial content, making it unclear whether they are embedding carbon reduction efforts in key operational activities.[65]
- As of 2023, only BMW and Mercedes-Benz provided comprehensive and integrated descriptions of the major financial impacts of their transition plans (such as projections, cost estimates or other estimates of financial viability) across all time scales, fully aligned with the overall business strategy and profit-and-loss statement.[66]
- Among the seven manufacturers that had committed to low-carbon spending as of 2025, only Tesla and General Motors disclosed financial commitments at the level required for a low-carbon transition.[67]
- One-third of the assessed auto manufacturers disclosed their spending on low-carbon research and development (R&D) activities, comprising on average 34% of their total R&D expenditure; however, none of the companies disclosed the share of their R&D investments in non-mature technologies.[68]
- Auto manufacturers continue to rely mainly on sales of fossil fuel vehicles, with revenue from low-carbon vehicle sales averaging only 17% in 2023 for the nine companies that disclosed these data.[69]

ii Emission intensity refers to the amount of carbon emissions per unit of transport service delivered, a metric that accounts for both emissions and operational output.

Automakers have been scaling up and reshaping their financial strategies to meet the IEA's goal of 65% electric vehicle sales in total car sales by 2030, in line with net zero emission trajectories.[70] As of 2022, electric car sales were broadly in line with a 1.5°C roadmap; however, the auto industry risked falling behind, given that no major manufacturer had pledged to fully phase out fossil fuel vehicle production by 2035 (Figure 4).[71]

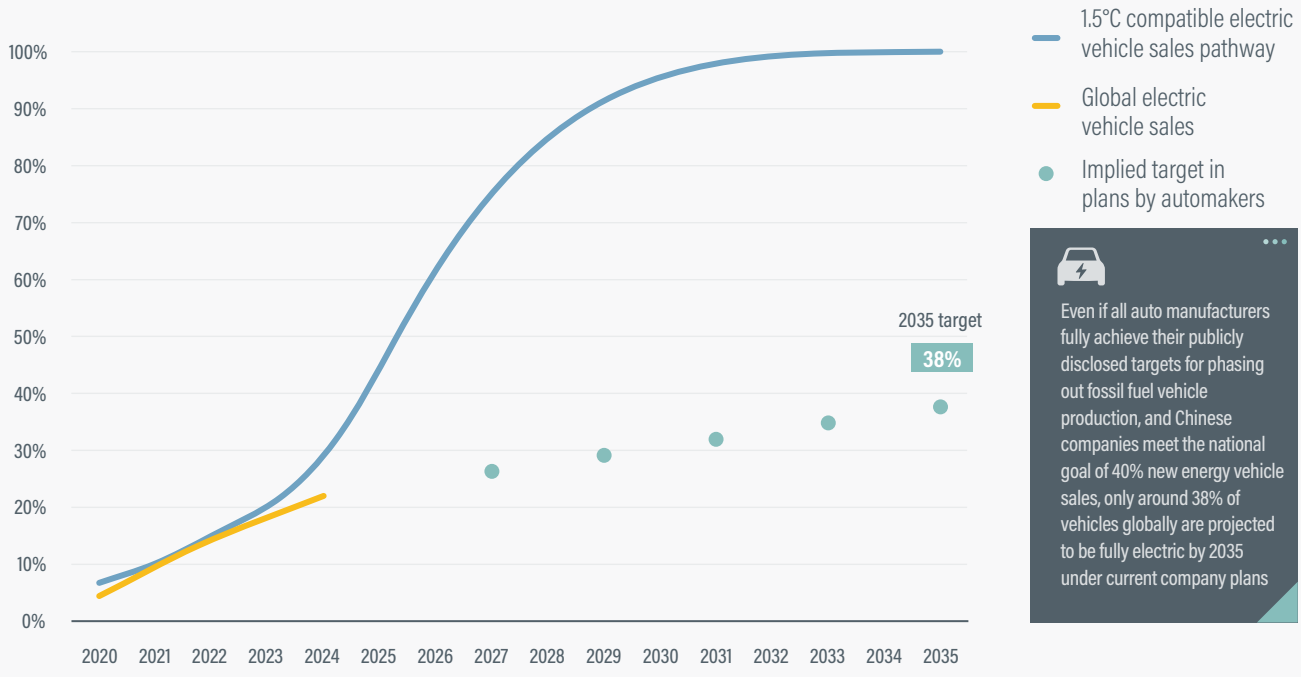
- In 2024, battery electric and fuel cell electric vehicles (excluding hybrid vehicles with combustion engines) represented 22% of global vehicle sales, up from 18% in 2023.[72]
- Global sales of battery-electric passenger cars surpassed 9.5 million units in 2023 and reached 11 million units in 2024.[73]
- China led global electric vehicle manufacturing in 2024 with over half of total output, followed by the United States with around 2.5 million units.[74]
- Only six auto manufacturers (Ford, General Motors, Hyundai, Kia, Renault and Stellantis) have committed to 100% electric car sales in specific markets, with five targeting Europe and one the United States.[75]

Even if all auto manufacturers fully achieve their publicly disclosed targets for phasing out fossil fuel vehicle production, and Chinese companies meet the national goal of 40% new energy vehicle sales, only around 38% of vehicles globally are projected to be fully electric by 2035 under current company plans.[76]

Electrification of heavy-duty vehicles has continued to lag that of light-duty vehicles. Buses remained the most mature category of electrified heavy-duty vehicles, with nearly 50,000 electric buses sold globally in 2023, or around 3% of total bus sales.[77] China led in the production of electric heavy-duty vehicles, driven by strong government support and substantial investment, although the European market gained ground.[78] Uptake of electric trucks has been much slower globally, but momentum is beginning to build. (See 5.2 Vehicle Electrification.)

- Electric truck sales increased 35% in 2023 to around 54,000 units globally, surpassing electric bus sales for the first time.[79]
- Among the major legacy truck manufacturers, only Daimler Truck disclosed its sales of low-carbon vehicles, which remained negligible.[80]

FIGURE 4. Projected gap in global electric vehicle sales, 2020-2035



Source: See endnote 71 for this section.

Alongside governments, major auto manufacturers have been investing in public charging infrastructure, which is key to supporting mass adoption of electric vehicles. Global charging infrastructure expanded more than 30% in 2024, adding more than 1.3 million public charging points.[81]

- Tesla opened more than 11,500 new Supercharger stalls in 2024, representing 19% growth.[82] As of 2024, more than 60,000 Superchargers were available worldwide.[83]
- In 2025, BYD unveiled a new fast-charging platform and announced that it would build a charging network across China.[84]

Aviation

The aviation industry has encountered significant obstacles towards decarbonisation, particularly in the adoption of sustainable aviation fuel and in the development of hydrogen-powered engines and aircraft.

Although new-generation aircraft from Airbus and Boeing are already compatible with up to 50% SAF blends, the pace of SAF adoption has been constrained by under-investment from the energy sector, which has not scaled production fast enough to meet aviation's climate targets.[85] **In 2024, SAF production doubled to 1 million tonnes, yet it accounted for just 0.3% of global jet fuel output.**[86]

The use of hydrogen-powered aircraft is still not a feasible business model. Although Airbus initially targeted 2035 for the entry into commercial service of a hydrogen-powered aircraft, it has postponed this goal to the late 2030s due to slower-than-expected technological advancements and infrastructure development.[87] Airbus aims to advance hydrogen-powered aviation through its ZEROe project.[88] In 2023, the company powered a 1.2 megawatt hydrogen fuel cell, and by 2024 it completed testing of an integrated fuel cell stack, electric motors, gearboxes, inverters and heat exchangers.[89]

Shipping

The current and projected uptake of zero-emission fuels in shipping – including ammonia, hydrogen and methanol – remains well below what is needed to meet Paris-aligned targets, based on a 2050 vision on fuel standards for shipping. According to the IMO's revised 2023 GHG Strategy, these targets would require at least a 20-30% cut in greenhouse gas emissions by 2030 and a 70-80% cut by 2040 (from 2008 levels) to reach net zero "by or around" 2050.[90] However, current adoption trajectories for zero-emission fuels fall well short of this 2050 fuel-standards vision.[91]

Rail

Leading rail manufacturers are deploying a diversified portfolio of alternative propulsion systems. These include hydrogen fuel cell trains (Alstom's Coradia iLint, Stadler's FLIRT H2)**, battery electric trains** (Stadler's FLIRT AKKU) **and advanced hybrid models** (Hitachi's Masaccio)**.** In 2023, Alstom allocated 80% of its total capital expenditure to low-carbon technologies, with related manufacturing activities accounting for 41% of the company's overall budget for capital expenditures.[92]

Rail manufacturers are cleaning up their operational emissions through renewable and clean energy investments. This includes offering tailored solutions for different rail networks, whether bridging electrification gaps with batteries or enabling long-distance, zero-emission travel with hydrogen.[93]

- Alstom has secured renewable electricity for its European sites through a long-term virtual power purchase agreement.[94]
- Stadler rely on widespread installation of on-site solar photovoltaic systems to power their production facilities.[95]

Box 3. Supply chain development among transport manufacturers

Electric vehicles and batteries

In 2023, demand for batteries and critical minerals continued to grow, with 95% of this growth from sales of electric cars. China continued to dominate global battery production, manufacturing more than three-quarters of batteries sold worldwide in 2023 (Figure 5).

- Although the current planned battery production capacity for 2030 (7,300 gigawatt-hours (GWh) per year) exceeds the anticipated demand for electric vehicle batteries (4,300 GWh per year), efforts are still needed to secure the necessary raw materials for these batteries.
- In 2024, responses from more than half of executives in major battery, automotive, and energy and utilities organisations indicated that securing a stable supply chain for battery components and materials was a key impediment to scaling up production.

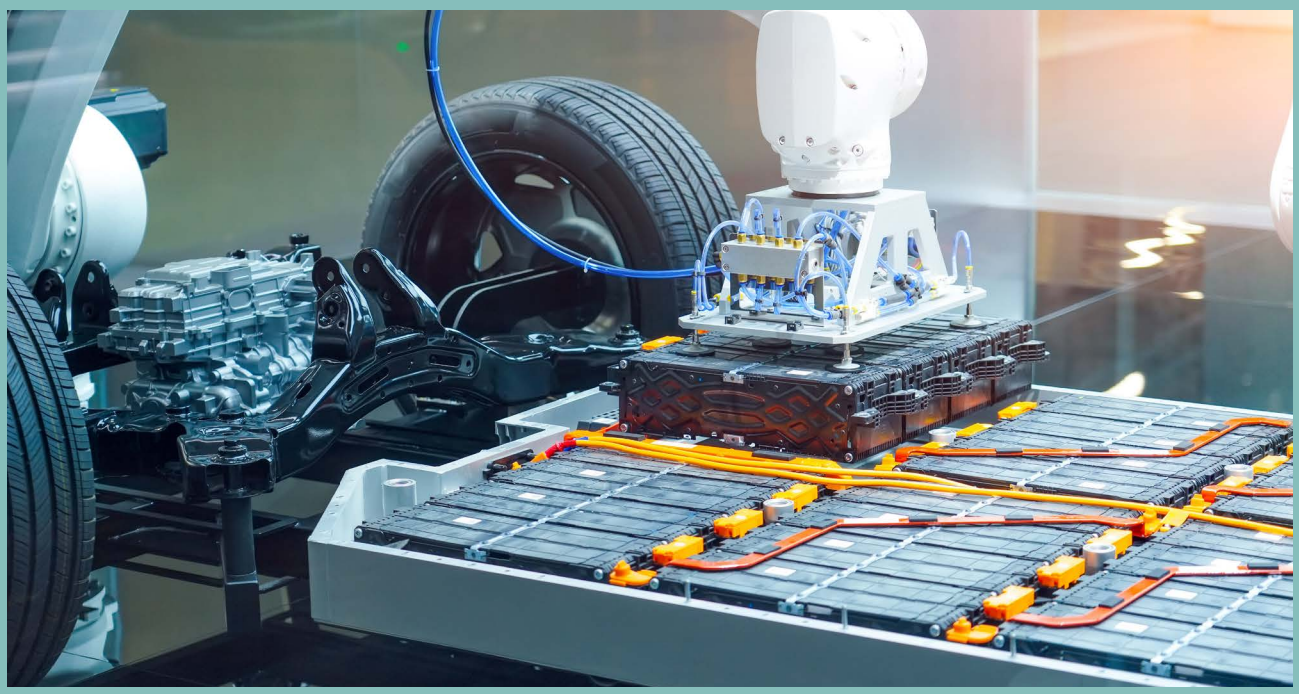
Batteries play a pivotal role in decarbonisation, contributing up to 60% of the required CO_2 emission reductions in the energy sector by 2030 in one scenario. However, geopolitical and trade tariff tensions may disrupt material supplies and slow production of electric vehicles and related batteries. Battery production also releases high upstream emissions during raw material extraction and processing.

In 2024, Western economies contributed minimally to upstream battery production processes, such as mining and refining. Europe accounted for more than 25% of global electric vehicle production yet held limited upstream capacity apart from 20% of global cobalt processing; the US played an even smaller role, with just 10% of electric vehicle production and 7% of battery manufacturing capacity. In contrast, China dominated with 57% of global lithium-ion battery production and the highest concentration of refined materials.

This geographic imbalance limits the ability of Western countries to manage or reduce the environmental impacts of resource extraction, despite strong regulatory ambitions at home. Fully decarbonising the electric vehicle sector requires streamlined in-house operations and external production with binding emission targets.

- As of 2023, only two major auto manufacturers – representing 6% of the electric vehicle market – required their suppliers to meet 1.5°C-aligned emission goals, and none had specific targets for battery suppliers.
- A total of 11 manufacturers – representing 60% of the global electric vehicle market – were shifting to in-house battery production as of 2023, enhancing their control of low-carbon activities. The companies were BAIC, BMW, BYD, Changan Automobile, Ford, GM, Guangzhou Automobile Company, Mercedes-Benz, Suzuki, Tesla and Volkswagen.

New US and EU tariffs announced in 2024 on electric vehicles and battery imports from China, as well as the US Trump administration's ongoing protectionist stance in industrial policy, will have implications for the competitive landscape of the automotive sector. Other regional policies, such as Indonesia's Export Ban on Nickel and China's New Graphite Restrictions in 2023, may further pose uncertainties in the supply of minerals globally.



Aviation

Production shortfalls by aircraft and engine manufacturers have caused persistent supply chain delays. Record-high backlogs in aircraft deliveries were expected to continue into 2025, impacting airline performance by raising costs and limiting growth.

- Aircraft deliveries in 2024 were 30% below forecasts – with 1,254 units delivered versus 1,813 expected – and projections for 2025 were also downgraded.
- At current rates (as of 2024), clearing the record backlog of 17,000 aircraft orders (cumulative number of unfulfilled orders) would take 14 years, double the pre-pandemic average.

Shipping

Although some shipping companies have set goals for procuring "green steel", little progress has been made in terms of policy supports, commitments from the steel industry and agreed-upon decarbonisation pathways. Because shipbuilding relies heavily on steel, the transition to low-carbon or green steel is essential for reducing emissions in the sector.

- Some shipping companies have joined the SteelZero initiative, which requires members to commit to using 50% "low-carbon steel" by 2030 and 100% by 2050.
- Maersk, the world's second largest shipping company, aims to procure, specify or stock 50% "low-emission steel" by 2030 and to set a clear pathway to using 100% net zero emission steel by 2040.
- The Ship Recycling Transparency Initiative was established in 2018 to advance responsible ship recycling by encouraging shipowners to publicly disclose their policies and practices.

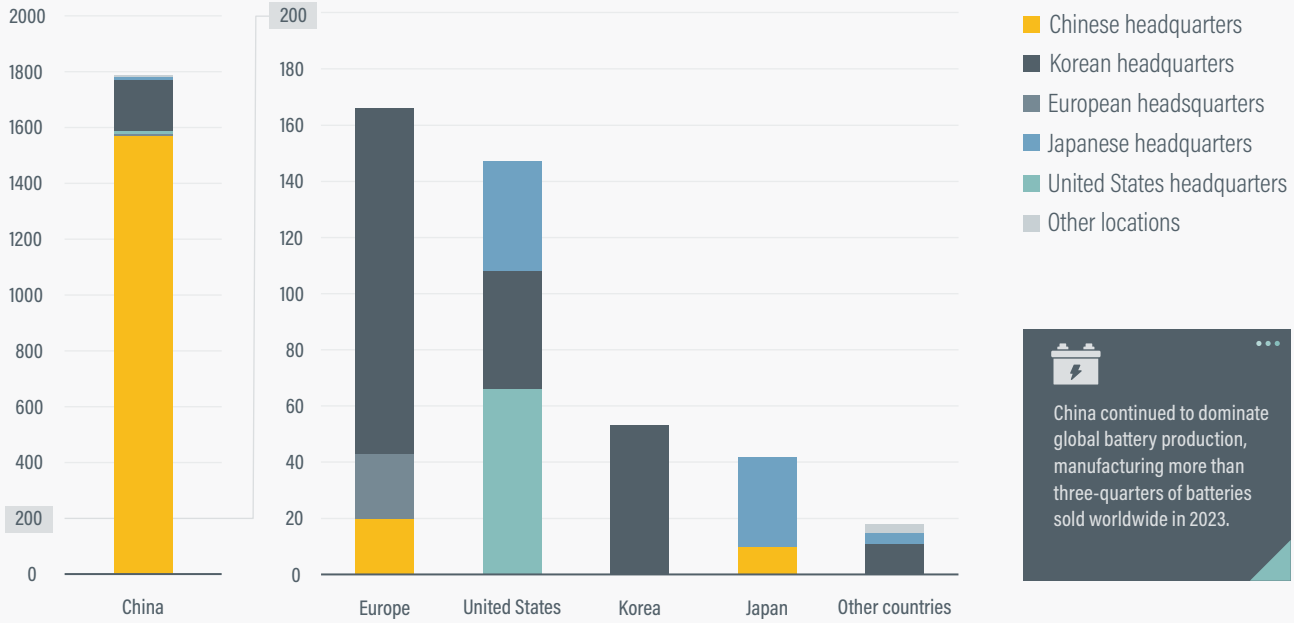
Rail

Railway companies have increasingly embedded sustainability into their supply chains, with 73% including green clauses in supplier contracts and 63% monitoring the sustainability performance of suppliers as of 2022. Initiatives to cut waste and emissions include the use of recycled materials (such as in SNCF's eco-friendly sleepers) and circular economy programmes (such as KORAIL's e-waste recycling). China's CRRC, a leading rail transit manufacturer, has strengthened its global position through innovative supply chain strategies: by leveraging smart technologies and regional industrial clusters, the company sourced more than 80% of its components locally in 2023.

Source: See endnote 96 for this section.

FIGURE 5. Lithium-ion battery manufacturing capacity by region of manufacturer headquarters, 2023

Battery manufacturing capacity by headquarters in gigawatt hours



China continued to dominate global battery production, manufacturing more than three-quarters of batteries sold worldwide in 2023.

Transport service providers and operators

Of the 1,061 transport service companies that disclosed targets to CDP in 2023, only one reported having all 21 key indicators of a Climate Transition Plan.[97] Of the remaining companies, 10% (104 companies) had many of these indicators, 19% (202 companies) had some indicators, and 71% (754 companies) had few indicators (Figure 6).[98]

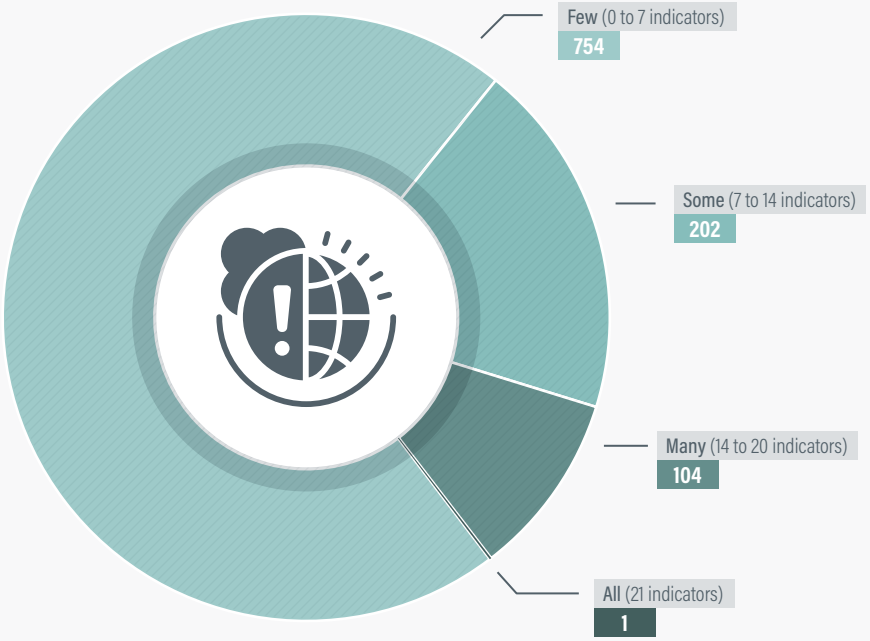
Action by transport service providers and operators has focused mainly on electric and zero-emission vehicles.

- Hitachi Rail launched the Masaccio Battery Train in Italy, as well as digital traffic management systems and smart mobility platforms in various cities.[99]
- As of 2023, Mobico Group had deployed 683 zero-emission vehicles (including 140 electric buses in Coventry), saved 2,351 tonnes of CO_2 annually by converting 21 buses to hydrogenated vegetable oil (HVO) biofuel in Ireland, and secured USD 72 million for electric school buses in North America.[100]
- New Zealand Post transitioned 67% of its nearly 1,000-vehicle fleet to electric by June 2024 (including 99% of cars and 68% of vans), supported by 176 charging points and a USD 20 million financing agreement with NZ Green Investment Finance.[101]

Third-party logistics providers are pursuing operational decarbonisation through combined strategies including vehicle electrification, alternative fuels, fuel-saving driver practices and digital tools.

- Amazon had more than 31,400 electric delivery vans on the road in 2024, moving towards its 2030 goal for electric vehicle deployment.[102] The company offset 100% of its electricity use for operations with renewable energy as of 2023, five years ahead of its 2025 target.[103]
- GXO Logistics has introduced multiple diesel-reduction strategies including anti-idling enforcement, driver training for fuel-efficient driving, and aerodynamic fleet vehicles.[104] In collaboration with Datasparq, GXO has implemented artificial intelligence-based route optimisation for its operations in Iceland and the United Kingdom; the initiative spans four distribution centres and more than 50 million kilometres annually, leading to enhanced route efficiency, productivity gains and driver satisfaction.[105]
- J.B. Hunt reported that 65% of its total diesel purchases in 2023 were renewable diesel blends or blends derived from biological sources such as plant oils or animal fats, with 24% of total fuel sourced from renewables.[106] The company operated eight eCascadias (electric trucks) and 182 natural gas-powered trucks.[107] As of 2023, it had 27 zero-emission vehicles, with plans to expand this fleet.[108]

FIGURE 6. Number of key indicators included in Climate Transition Plans of transport service companies



Of the 1,061 transport service companies that disclosed targets to CDP in 2023, only one reported having all 21 key Climate Transition Plan indicators. 71% had few indicators, 19% had some, and just 10% had many.

Source: See endnote 98 for this section.

Advocacy

OEMs

Automotive

The advocacy and policy positions of leading global auto manufacturers have posed a significant obstacle to operationalising climate-friendly policies in the industry. Many companies have supported policies favouring internal combustion engine (ICE) vehicles.[109] **The resistance to stricter vehicle emission standards and accelerated ICE phase-out policies have been compounded by factory closures and job losses. The EU has partially rolled back its vehicle emission and ICE phase-out targets following industry pushback and trade tariff tensions with the United States.**

- The European Commission announced that it would lower its 2025 emission targets for sales of new light-duty vehicles and allow auto manufacturers to continue to sell ICE vehicles beyond 2035.[110]
- For heavy-duty vehicles, the European Automobile Manufacturers' Association (ACEA) pushed back on the European Council's 2024 proposed stricter regulation on CO_2 emissions and higher associated fines. The ACEA argued that automakers that fall short on targets starting in 2025 would undermine the sector's progress, and that the fines could instead be redirected to the transition to zero-emission vehicles, avoiding job losses and strengthening the EU supply chain (which already faces high competition from Asian markets).[111] In 2025, the EU Council approved the penalty relief and the call for flexible measures for the auto manufacturing sector.[112]

As of 2023, 60% of auto industry players had not disclosed how they govern their relationships with trade alliances, associations, coalitions and think tanks – influential parties through which companies can indirectly influence climate-related policy.[113] The majority of industry players did not have a process for monitoring and reviewing the climate policy positions of the alliances, associations, coalitions and think tanks of which they were members, and virtually all failed to disclose an action plan for addressing instances when such associations were found to oppose climate policies. However, some manufacturers have stronger processes in place to govern their relationships.

- Ford, GM, Honda and Volkswagen all mentioned plans to withdraw funding from, or suspend or end memberships with, alliances, associations, coalitions and think tanks if these organisations opposed climate policies or engaged in climate-negative activities.[114]
- Analysis found that only 40% of auto manufacturers were not members of, and did not provide funding to, alliances and associations that had climate-negative activities or positions; the remaining 60% did engage with influential parties linked to negative climate actions.[115]

Overall, as of 2023, 63% of the automotive industry disclosed public support for significant climate policies, including a commitment to the Paris Agreement; however, only 37% of industry players had a monitoring and reviewing process to ensure that their policy positions aligned with the Paris goals.[116] Most of the auto industry collaborates with national and sub-national authorities on emission reduction projects.

- Ford has embedded many of the fundamentals of policy engagement supportive of strong climate action. It has a comprehensive policy covering all subsidiaries and jurisdictions, and discloses all affiliations and reviews memberships annually, with board oversight and actions including withdrawal from misaligned groups.[117] The company's climate advocacy aligns with the Paris Agreement, is backed by the SBTi and supports initiatives such as the United Nations' 1.5°C pledge.[118]
- Among truck manufacturers, Volvo has shown only average policy engagement, while Scania has demonstrated a minimum standard by avoiding support for climate-negative actions.[119]
- Daimler encourages regular stakeholder engagement and continuously exchanges with employees, customers, and suppliers, contributing to societal dialogue.[120]
- Volvo AB has publicly committed to international low-carbon pledges and participates in initiatives against climate change. [121]

Beyond the auto industry, most other transport manufacturers have shown limited corporate policy engagement, with few signs of active participation in associations or coalitions (Figure 7).[122]

Aviation

The International Civil Aviation Organisation (ICAO) has agreed on a methodology for monitoring and reporting emissions in the sector, including stricter standards for CO_2 and non-CO_2 emissions.[123] **Both Airbus and Boeing have expressed alignment with low-carbon goals and have publicly supported and committed to the principles of the Paris Agreement; however, neither company has specified a monitoring and review process to ensure that its policies are aligned.**[124]

- Boeing has a company-wide engagement policy that spans from manufacturing and supply chain players to customers and the communities that the company works in; although Boeing engages in dialogue with local authorities on climate policies, there is no evidence of significant partnerships or measurable emission reduction from these engagements.[125]

FIGURE 7. World Benchmarking Alliance scores for policy engagement of transport manufacturers

			WBA Indicators score			
Type Transport Manufacturer	**Country HQ**	**Company**	Company policy on **engagement** with Associations, Alliances, Coalitions or Thinktanks	Associations, Alliances, Coalitions and Thinktanks supported do not have **climate-negative activities or positions**	Position on significant **climate policies**	**Collaboration** with **local public authorities**
Aviation	France	Airbus	50	100	70	50
	USA	Boeing	75	50	70	25
	China	Comac	0	0	0	0
Rail	France	Alstom	40	100	60	75
	China	CRRC Corporation	0	0	0	50
	Switzerland	Stadler Rail	0	50	45	25
Ships	China	China State Shipbuilding	0	0	0	0
	Italy	Fincantieri	0	50	90	50
	South Korea	Hanwha Ocean	0	0	45	0
	South Korea	South Korea Korea Shipbuilding	0	100	30	0
Trucks	Germany	Daimler Truck	40	50	45	50
	USA	PACCAR	50	50	45	25
	Sweden	Scania AB	0	100	70	50
	Sweden	Volvo AB	60	50	90	25

Note: Scores greater than 70-100 = indicators met favourably; scores 40-69 = indicators met averagely; scores 0-40 = indicators met poorly (or unmet if 0).

Source: See endnote 122 for this section.

- Airbus appears not to support climate-negative actions and participates in small-scale pilot/short-term/one-off programmes.[126]
- China's state-owned plane manufacturer Comac does not meet any indicator related to policy engagement or climate-friendly policy.[127]

Shipping

In 2025, the IMO adopted the first legally binding Net-Zero GHG framework for global shipping, aligning the sector with the Paris Agreement.[128] While some shipping companies engage in climate actions, most have yet to address concerns about policy engagement with outside groups. The IMO framework, which will include emission limits and greenhouse gas pricing by 2027, marks a critical shift towards cleaner operations. However, a delayed timeline, announced in April 2025, raises concerns about its impact on meeting 2030 and 2050 targets.[129] (*See 4.10 Shipping.*)

- Korea Shipbuilding is the only major shipbuilder not fully engaged in supporting climate-negative action. Shipbuilders in the Republic of Korea support international climate goals, but without clear oversight processes.[130]
- Fincantieri has shown evidence of partnering with governments and universities to enhance shipbuilding innovation and reduce operational costs – including by improving the capabilities of commercial vessels; providing a co-operative framework for managing, focusing, developing and sharing R&D; and leveraging best practices in shipbuilding and repair.[131]
- Chinese manufacturers such as China State Shipbuilding have not shown evidence of favourable involvement in climate-friendly policies.[132]

Rail

All rail or rolling stock manufacturers have demonstrated some involvement with national and sub-national authorities to test or implement climate-related policies and partnerships; however, no manufacturers are entirely aligned with a low-carbon pathway.

- Alstom is not involved in climate-negative actions and supports international climate goals, but without clear oversight processes.[133]
- CRRC Corporation actively opposes climate policies.[134]

The European Rail Supply Industry Association (UNIFE) has been engaging and supporting European climate policies and ambitions to reduce rail sector emissions, in line with the 2030 greenhouse gas reduction targets. UNIFE has also advocated for a modal shift in transport towards rail.[135]

Knorr-Bremse is a founding member of the Europe's Rail Joint Undertaking which aims to deliver, via an integrated system approach, a high-capacity, flexible, multi-modal, sustainable, reliable and integrated EU railway network for European passengers and cargo and collaborates with more than 15 research institutions.[136]

Transport service providers and operators

Companies have increasingly collaborated with public authorities to elaborate policies, regulations, and standards, including related to a modal shift. However, these efforts range widely and are often localised.

- 20Cube encourages a modal shift from air to sea as well as truck-on-train logistics.[137]
- DHL engages in policy debates through logistics councils, supports mandates for SAF and advocates for standardised greenhouse gas accounting.[138]
- Hitachi Rail promotes public-private partnerships and stronger policy support for rail electrification.[139] The company advocates for a modal shift and focuses on digital solutions to support it.[140]

Global and regional advocacy coalitions have emerged in recent years. Cross-company coalitions such as EV100+, the First Movers Coalition (FMC), and the Zero Emission Leadership Coalition show promise, but they remain concentrated in major economies and sectors, with limited participation from emerging markets or smaller companies. These coalitions risk becoming echo chambers for large multi-national players unless they expand to include a broader diversity of actors, such as small carriers, logistics providers, and public transport authorities, particularly from low- and middle-income countries.

- Mobico Group – which operates in Canada, Germany, Morocco, North America, Spain, the United Kingdom and Ireland, and the United States – is a member of EV100 and leads the Zero Emission Leadership Coalition.[141]
- DHL is part of FMC, which pushes for SAF adoption and freight decarbonisation; as of 2024, the coalition had 28 members from aviation, 18 members from shipping and 16 members from trucking.[142]
- The International Union of Railways (UIC) plays a pivotal role in uniting railway operators worldwide to decarbonise the sector, align with net zero pathways and promote modal shift to rail.[143] Through joint commitments, technical standards, and knowledge-sharing platforms, UIC enables its transport service provider members to adopt concrete, measurable actions that cut emissions and improve efficiency.
- The United Kingdom's Network Rail – a signatory to the UIC Climate Declaration (2021) – aims for carbon neutrality by 2050 and is advancing low-emission operations, climate resilience, and diesel replacement with electric, battery and hydrogen traction.[144]

Accountability

OEMs

Automotive

Climate disclosures have become mainstream in the transport sector, yet critical accountability gaps remain – particularly in the reporting of Scope 3 emissions and the adoption of robust interim targets. To drive progress, companies must enhance their disclosure of emissions (including Scope 3), set emission reduction targets, increase the transparency of R&D and develop comprehensive transition plans.[145] Weak disclosure practices, particularly among East Asian manufacturers, continue to hinder climate and social performance.[146]

- More than 90% of top automotive and transport manufacturers have board-level climate oversight, yet only 17% possess strong expertise in climate change and low-carbon transition strategies – including BMW, Ford, Mercedes-Benz and Stellantis.[147]

Aviation

The aviation industry has sought to adopt best practices for globally recognised accounting systems for SAF uptake (regardless of uplift location), with the goal of facilitating economies of scale in SAF production.[148]

In 2024, global SAF output hit 1 Mt (about 1.25 billion liters), twice the 2023 volume, accounting for 0.3% of total jet fuel consumption, with 11 certified production pathways.[149]

In 2025, the IATA introduced the SAF Registry to standardise and transparently log SAF transactions, enabling stakeholders to track environmental benefits along the supply chain and claim them for both regulatory compliance and voluntary commitments[150]

Shipping

The global finance portfolio for shipping has aligned increasingly with the ambitious decarbonisation goals of the IMO, according to a 2024 disclosure report under the Poseidon Principles.[151] The Poseidon Principles is a framework designed to help financial institutions evaluate and disclose the climate alignment of their shipping portfolios.[152]

Since 2022, to enhance transparency, signatories of the Poseidon Principles have disclosed the share of their portfolio used to calculate climate alignment – known as the reporting percentage. The average reporting percentage rose from 91% in 2022 to 93.3% in 2024, with 80% of signatories disclosing reporting percentages of more than 90% and eight achieving full (100%) reporting.[153]

Transport service providers and operators

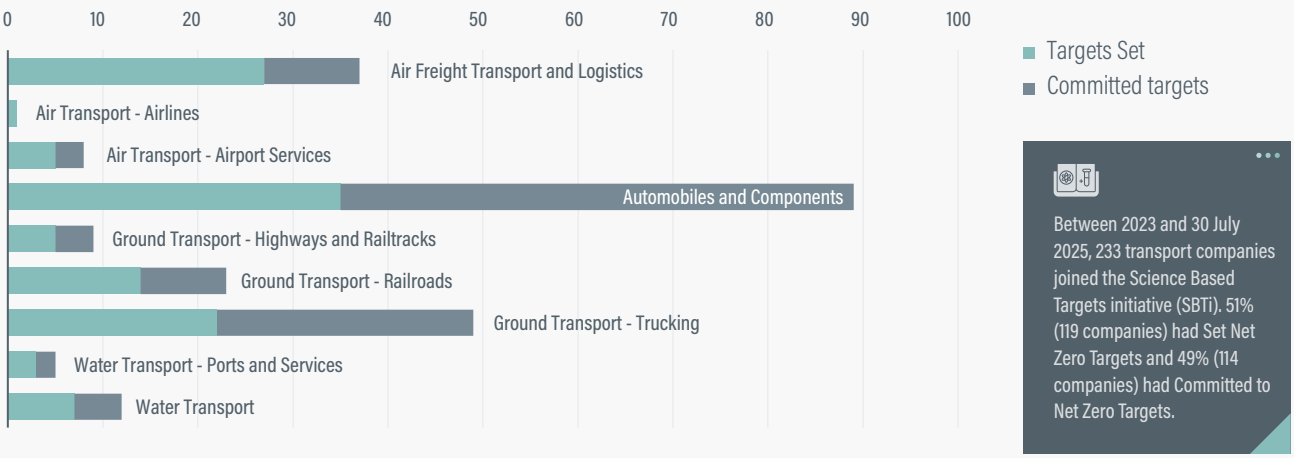
Although target setting has improved for transport service providers and operators – with more companies now publishing science-aligned or time-bound climate targets – verification has remained questionable. Between 2023 and 30 July 2025, 233 transport companies joined the Science Based Targets initiative (SBTi); of these, 51% (119 companies) had set net zero targets, and 49% (114) had committed to net zero targets (Figure 8).[154] (In the SBTi framework, companies with targets "set" have validated science-based decarbonisation targets, while those marked "committed" have pledged to set such targets.)

- Knorr-Bremse has validated Scope 1-3 reduction targets, and reports annually using SBTi-aligned pathways.[155]
- New Zealand Post offers transparent updates, backed by fleet electrification data, financing details and public emission disclosures.[156]

Companies increasingly mention Scope 3 emissions, yet few offer detailed disclosures or breakdowns. The risk of overstated environmental claims remains significant. In the aviation sector, companies often highlight biofuels and optimisation even as SAF use remains very low. Major blind spots in accountability include emissions from supply chains, infrastructure, vehicle manufacturing and embedded energy in fuels. Many transport companies claim future decarbonisation while continuing to expand routes, fleets and hubs.

- DHL and other FMC members target 30% SAF use by 2030; however, as of 2024 the share of SAF use globally was just 3.5%.[157]
- In India, actors such as Indian Oil, IndiGo, Vistara and the Indian Air Force are piloting SAF use, but none have yet met the FMC's SAF 85 standard, which requires a minimum 85% reduction in life-cycle greenhouse gas emissions.[158] Key barriers to scaling near-zero emission aviation in India include the high cost of SAF 85 production (2-3 times the cost of jet fuel), uncertain access to green hydrogen and a lack of demand.[159]

FIGURE 8. SBTi net zero commitments across transport industry sub-sectors, 2023-2025



Between 2023 and 30 July 2025, 233 transport companies joined the Science Based Targets initiative (SBTi). 51% (119 companies) had Set Net Zero Targets and 49% (114 companies) had Committed to Net Zero Targets.

Source: See endnote 154 for this section.

The "4 A's" across companies that use transport

Companies engage in transport both through their own fleets and by using public and freight services provided by third parties. A shipper is any entity that sends, receives, or manages the transport of goods, typically by contracting carriers or logistics providers, even if they do not operate transport vehicles themselves. Freight buyers and large corporate players also play a pivotal role in determining how goods are transported across global and regional supply chains.

These actors shape the transport space by leveraging their purchasing power to demand zero-emission transport services, sustainable fuels, and clean infrastructure, thereby influencing market dynamics and policy directions. Key players include companies such as IKEA and Unilever, as well as coalitions and alliances such as EV100/EV100+, FMC, the Zero Emission Maritime Buyers Alliance (ZEMBA) and the Getting to Zero Coalition. Table 3 summarises the engagements of these groups in the transport space since 2023.[160]

- IKEA is targeting 100% zero-emission deliveries by 2025 and net zero emissions across its value chain by 2039; it aims to support this through electric vehicle pilots globally, modal shifts, and strong advocacy for infrastructure and supply-side policies, while transparently disclosing progress and defining zero-emission vehicles by tank-to-wheel emissions.[161]
- Unilever targets net zero emissions by 2039 across its value chain and is advancing this through renewable logistics pilots, efficiency improvements, and active participation in global alliances such as FMC, with transparent reporting via science-based and third-party verified platforms.[162]

TABLE 3. Summary of the "4 A's" of selected coalitions and alliances in the transport sector

Coalition/ Actor	Ambition	Action	Advocacy	Accountability
EV100 and EV100+	Electrification of vehicle fleets (public and freight); 100% electric vehicles by 2030.	More than 700,000 electric vehicles across 76 markets; 138,749 battery electric vehicles added in 2023; 400 e-trucks deployed in medium- to heavy-duty vehicle segment.	Promotion of corporate fleet transition; policy influence through demonstrating large-scale demand.	70% of members on track for 2030 goals; transparent reporting of fleet electrification.
First Movers Coalition (FMC)	Using purchasing power to scale decarbonisation of aviation, trucking and shipping.	28 companies committed to replacing 5% jet fuel with SAF (85% fewer life-cycle emissions).	Public-private partnership; advocates for clean fuel development and deployment.	Member performance documented in climate action platforms such as Climate Transition Action Plans.
Getting to Zero Coalition (via Global Maritime Forum)	Zero greenhouse gas emissions in shipping by 2050 (aligned with the IMO).	Cross-sector collaboration for scalable zero-emission shipping fuels and technology.	Influence on maritime regulation (e.g., IMO) through coalition strength.	Tracks adoption progress; includes Poseidon Principles for finance/ insurance accountability.
Zero Emission Maritime Buyers Alliance (ZEMBA)	100% zero-emission shipping for freight operations by 2040; net zero by 2050.	Support for scalable, verified zero-emission maritime shipping solutions; buyers form a demand coalition.	Shippers drive zero-emission shipping by aggregating demand and pushing maritime carriers.	Third-party verification of zero-emission shipping; alliance fosters buyer-side accountability.

Source: See endnote 160 for this section.

Box 4. Gender equity in the private transport sector

Despite some progress and the setting of diversity targets, private sector players in transport have lagged in achieving meaningful gender representation. A few companies have demonstrated leadership through gender pay equity and diversity initiatives, yet overall efforts remain insufficient. Targets exist for increasing the number of women in senior roles, but tangible outcomes and broader industry-wide change are still limited.

- Maersk has committed to increasing the share of women in management and leadership positions from 35% in 2023 to more than 40% by 2025, and to boosting the share of executives of diverse nationalities from 20% in 2023 to more than 30% by 2025.[163]
- In 2022, New Zealand Post's gender pay gap was only 0.8%, down from 1% in 2021, compared to a national gender pay gap of 9.2%.[164] The company's progress is supported by actions including: unconscious bias training for employees and management; use of diverse hiring panels to promote fair recruitment; annual gender pay analysis as part of routine performance and compensation reviews; and public disclosure of pay gap data, with new efforts planned to address ethnic and cultural gaps.[165]
- At Swiss Post, 25.4% of senior managerial positions were held by women as of 2023, and 44.4% of board directors were female.[166]
- As of 2022, the public transport company Transdev had 26% women in the workforce; the company's diversity and inclusion roadmaps set a target for 34% women in top executive positions.[167]

Challenges and opportunities for decarbonising private transport

Stable, forward-looking regulation presents a vital opportunity for the private sector to lead the transformation towards net zero emissions in the road transport sector. Regulatory clarity can stimulate investment in low-emission technologies, encourage innovation and create competitive advantages for first movers. However, recent significant opposition within the automotive, petrochemical and affiliated industries has diluted or delayed climate policies in key jurisdictions, undermining this potential.[168] Industry players can help shape cost-effective, technology-agnostic pathways to reduce emissions in freight and logistics.

- The US Chamber of Commerce has called for a weakening of proposed greenhouse gas emission standards for light- and medium-duty vehicles beyond 2027, citing concerns about supply chain constraints, charging infrastructure and grid reliability.[169]
- The US National Federation of Independent Business has opposed the Environmental Protection Agency's proposed Phase 3 greenhouse gas standards for heavy-duty vehicles, citing economic costs and insufficient supporting infrastructure.[170] The federation's assertion that the standards would lead to trucks that are three times as expensive, with half the range and double the servicing costs, underscores the need for collaborative policy making.[171]
- BusinessEurope has opposed the EU's proposal to mandate 100% CO_2 emission reductions from new cars and vans by 2035, advocating instead for a 90% target.[172] Their argument rests on preserving technological neutrality and allowing room for low-carbon fuels. This reveals a broader tension between the urgency of climate targets and the desire to preserve incumbent technologies. However, businesses embracing full decarbonisation targets can benefit from clarity in future market trajectories, investor confidence and a growing consumer demand for cleaner mobility.
- The Australian Chamber of Commerce and Industry (ACCI) has challenged the proposed New Vehicle Efficiency Standard, arguing that it imposes disproportionate costs on manufacturers and ultimately consumers.[173] ACCI has proposed exemptions for large sport utility vehicles (SUVs) used by tradespeople and emergency services, and recommended aligning with the US approach, which exempts vehicles above 3.6 tonnes.[174]

Collectively, these positions reflect a reluctance among some actors to embrace regulatory ambition. Yet these very regulations – if designed in collaboration with industry – can unlock significant business opportunities: driving new product development, opening export markets for clean technologies, and lowering long-term operating costs through improved efficiency.

Rather than opposing reform, businesses stand to gain by actively engaging in the regulatory process and leading on solutions. Constructive partnerships between government and the private sector will be essential to ensure that policies are not only ambitious and credible but also practical and supportive of innovation. This is not merely a compliance challenge – it is a commercial opportunity to shape the future of mobility and to lead the low-carbon transition in a way that is profitable, inclusive and forward-looking.

Digital payment platforms such as Mastercard and Visa present an opportunity to accelerate decarbonisation across transport systems, particularly in first- and last-mile connectivity. By enabling open-loop, contactless fare systems and app-based ticketing, these players reduce reliance on cash-based infrastructure and improve operational efficiency – key prerequisites for scaling low-emission mobility. For

private operators such as bike-shares or e-scooter companies, integrating with such digital payment backbones allows them to plug into a broader mobility ecosystem, making their services more discoverable, usable and efficient.[175]

- Mastercard's partnership with Metro de Panamá illustrates how open-loop payment systems can simplify access for more than 200,000 daily users, including tourists and occasional riders.[176] By facilitating fare payments through contactless cards, phones, or wearables, Mastercard supports more seamless multi-modal travel.
- Visa's Mobility & Transport Transaction (MTT) model, active in more than 250 cities, enables private mobility providers to integrate with public fare systems through contactless EMV-based infrastructure.[177]
- Through programmes such as "Visa Ready for Transit", private companies can deploy certified, inter-operable solutions that connect with public transport schedules and payment systems.[178] This fosters a unified user experience and improves the case for shifting from car ownership to shared, lower-emission travel modes.

Newer OEMs that do not have legacy platforms based on ICE technologies are uniquely positioned because they are not constrained by fossil fuel phase-out targets and can instead focus on achieving full life-cycle sustainability from the outset. However, real progress towards decarbonisation will depend on whether the transition strategies of these manufacturers are time-bound, financially viable and focused on aligning core business functions (including capital expenditure and R&D) with low-carbon technologies, such as battery manufacturing and charging infrastructure.

Unlocking future market potential will also require a strategic pivot away from high-cost premium electric vehicles towards more affordable models. However, this is complicated by protectionist trade measures that have constrained global supply chains and could delay cost parity with ICE vehicles. Unless industrial policies support cost-effective local manufacturing, and manufacturers realign their offerings, the sector may miss a crucial window to scale electrification equitably.

ENDNOTES

2.1 NATIONAL TRANSPORT PATHWAYS TO REACH CLIMATE AND SUSTAINABILITY GOALS

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