World Benchmarking Alliance

Climate and Energy Benchmark: Automotive and Transportation Manufacturers

Methodology Report

July 2024

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Introduction

The transformation required to decarbonize the movement of people and freight starts with the technological choices for powering vehicles, vessels, planes, and trains. By 2030 sales of electric vehicles need to outstrip conventional ones (IEA 2024), hydrogen vessels must be market-ready (IEA 2023) and the first hybrid-electric regional aircraft take-off (IATA 2023). With a sector that is responsible for about 21% of global energy emissions, we aim to assess how keystone manufacturers are preparing for this technological shift.

The movement of people and goods across our cities, regions and continents released 8 Gt of CO_2 in 2022, about 21% of global energy-related emissions (IEA 2023). Central to this carbon footprint are the technological choices powering vehicles, vessels, planes and trains. In the remaining years to 2030, transportation manufacturers must align their technology offering with that required to achieve a 25% reduction in CO_2 transport emissions from current levels. For some industries, such as automotive, this means scaling up tested and proven battery technology. For others, like aviation, it involves developing a range of solutions, from efficiency improvements to breakthrough technologies.

One of the most significant and consumer-relevant changes is replacing conventional internal combustion engine vehicles in cars and vans (light-duty vehicles) with battery-powered electric vehicles (EVs). Light-duty vehicles are responsible for about 44% of CO_2 emissions in the transport sector and 10% globally (IEA 2023), making the investigation of the automotive industry paramount to this benchmark. EVs, including plug-in hybrids, made up 12% of new light-duty vehicle sales in 2022. This figure needs to rise to 66% by 2030 to meet the 1.5°C Net Zero Emissions by 2050 (NZE) scenario. (IEA NZE 2023). Realizing this ambition is disrupting manufacturing, unsettling workers' unions, and causing political tension. In early 2024, China's EV exports surpassed Tesla's, altering the competitive landscape (Sustainalitics 2024). Governments are negotiating protectionist trade tariffs for EVs, which may lead to higher prices and production bottlenecks (IFW 2024). Producing EVs is a process that requires different technologies and associated skill profiles compared to internal combustion engine (ICE) vehicles, which means that the transition involves both opportunities for upskilling and the creation of more human capital, as well as risks of job displacement and increased redundancies where skills are not transferable. The exact impacts on workers are still hard to determine, as it depends a lot on both the manufacturers and their suppliers, but it is likely that impacts on workers will be significant all over. In Germany alone, 165,000 workers could be affected by 2030 due to reduced ICE vehicle production (IFO 2021). This benchmark evaluates automotive manufacturers' efforts and ambitions to decarbonize their business models. It assesses their technological alignment with the Paris Agreement, the adequacy of their transition planning, and their relationships with the broader value chain, all while ensuring a just transition for their workers.

A similar transformation needs to take place in the powertrains equipping heavy trucks, responsible for the large share of goods reaching our cities. These vehicles are the transportation sector's second largest source of greenhouse gas emissions (ICCT 2022). Decarbonizing heavy trucks involves using battery electric trucks (BEV) for urban and regional transport and hydrogen fuel cell (HFC) trucks for long-haul routes. These technologies need to account for 45% of heavy truck sales by 2030 and nearly

100% by 2040 to meet the transportation sector's emission reduction targets in line with the Paris Agreement. (ICCT 2022).

Expanding beyond land, the ocean shores will need to harbour ships moved by hydrogen or ammonia (the two most promising fuel technologies to decarbonise the industry, WRI 2023) no later than the year 2030. By then, the share of low-carbon fuels in international shipping need to reach 13% (IEA 2023). The International Maritime Organisation's (IMO) GHG reduction strategy sets 5% as main expectation for the share of low-carbon fuels in the sector by 2030 with extra ambition toping at 10%. Ship manufacturers need therefore to move beyond the recommendation of UN's international body. Failing to do so will keep emissions from shipping floating at around 3% of global anthropogenic GHG emissions (IMO 2020).

Plane manufacturers need to adopt various decarbonization strategies by 2030, including revolutionary fuel-efficient designs, hybrid regional aircraft, scaling sustainable aviation fuels[1] (SAFs), and testing hydrogen-powered turbines (IATA 2023). Despite these efforts, emissions in the sector are not expected to fall before 2030, when they are projected to make up 1 Gt of CO_2 emissions (IEA NZE 2023). SAFs face scaling costs and feedstock limitations, hindering their ability to meet 10% of aviation fuel demand by 2030 (IEA 2022). Battery-electric and fuel-cell aircraft will be limited to small, short-range planes due to battery weight. And while hydrogen combustion holds promise for carbon-free long-haul flights, significant deployment is not expected before the year 2040.

While it is acknowledged that automotive manufacturers play a crucial role in aligning transportation with a 1.5-degree world, from an accountability perspective this benchmark expands its scope to manufacturers of all relevant modes making up the global transportation system.

This sector-specific methodology report complements our general methodology for the Climate and Energy Benchmark.

[1] Aviation fuel produced from sustainable feedstocks (cooking oil, energy crops or municipal waste) rather than fossil sources like crude oil.

Benchmarking companies in automotive and transport manufacturing

ACT and Social assessments

The shift towards a renewables-based energy system entails a deep restructuring of global economies, with just transition at the core of this transformation. The Automotive and Transport Manufacturers (ATM) Benchmark takes a holistic approach to assess companies integrating social criteria as part of our methodology. As explained in our general methodology, our benchmark comprises an ACT (Accelerating Climate Transition) assessment (60% of the total score), and a social assessment (20% from Just Transition indicators and 20% from core social indicators).

Scope of the ACT methodology in the benchmark

For this benchmark, we will assess the automotive and transportation manufacturers sector considering two different ACT methodologies based on the scope of companies' activities:

1. The ACT Automotive Manufacturer methodology applies to companies involved in the design, assembly and sale of ready-to-use light duty vehicles (passenger cars and light commercial vehicles exhibiting a gross vehicle weight lower than 3.5 tonnes). Companies manufacturing vehicle parts but not assembling vehicles themselves are not included in the scope of the methodology.

2. The ACT Generic methodology will be used to assess transportation manufacturers, such as companies involved in the design, manufacture and sale of aircraft, rolling stock, heavy vehicles and shipping vessels.

The corresponding Nomenclature of Economic Activities (NACE) codes regarding the scope of activities considered in the ACT Automotive Manufacturer methodologies are presented below.

Industry	Activities included in ACT methodologies scope
Automotive Manufacturers	[29.10]: Manufacture of motor vehicles*
Transportation Manufacturers	[29.10]: Manufacture of motor vehicles* [30.1]: Building of ships and boats [30.2]: Manufacturer of railway locomotives and rolling stock [30.3] Manufacture of air and spacecraft related machinery

** Light-duty vehicles (LDV) fall in the scope of the ACT Automotive Manufacturer methodology, while heavy-duty vehicles (HDV) do not, meaning that HDV manufacturers are assessed thanks to the ACT Generic methodology.*

For each methodology, the scope of activities assessed is defined in a way that ensures that most of the sectoral emissions sources are covered. For more details about the sectoral activities and how they are taken into account in the assessments, please refer to the section 3 of the ACT Automotive Manufacturer and Generic methodologies.

The benchmark's social assessment includes just transition and core social indicators. Just transition indicators evaluate companies on their social responsibility, focusing on future plans, commitments, and measurable targets. Core social indicators assess company policies, disclosures, and past performance. Unlike ACT, this social assessment is sector-agnostic, applying the same set of indicators

to automotive and transportation manufacturer companies. These indicators are designed to ensure that, there is no one left behind in the transition to a low carbon future. The Just Transition indicators include:

- Social dialogue and stakeholder engagement.
- Just transition planning.
- Creating and providing or supporting access to green and decent jobs.
- Retaining and re- and/or upskilling.
- Social protection and social impact management.
- Advocacy for policies and regulations

The Automotive and Transportation Manufacturers (ATM) Benchmark as a roadmap

The ATM Benchmark can act as a roadmap for companies to show how they can contribute to achieving the SDGs and the Paris Agreement goals. The ACT assessments place a particular emphasis on the following key areas: alignment of a company's targets across the value chain (i.e., scopes 1, 2, and 3, especially considering downstream emissions from the use of sold products); contribution to key sectoral topics such as increasing the share of electric (zero-emissions) vehicles sales, changes in business models and client engagement strategies, as well as the trend in future upstream and downstream emissions intensity of manufactured and sold products. Companies will also be assessed on their low-carbon research and development (R&D) expenditure which are necessary to enable the transition of these manufacturing industries. The ACT methodologies' definitions of low-carbon products and services are aligned with the EU Taxonomy, which includes the manufacture of automotives and other means of transportation. Further, each company's development of a low-carbon transition plan and scenario analysis, determining the impact on its strategy/business model, are also important elements of the assessments.

The ACT Automotive Manufacturer and ACT Generic methodologies were developed with input from a multistakeholder Technical Working Group. Public consultation and a thorough technical 'road test' were important steps in the development of the ACT methodologies. ACT sought the views and opinions of a wide range of stakeholders including companies, civil society, academics and other relevant experts. More recently, the ACT Automotive Manufacturer and Generic methodologies (hosted by WBA) have gone through a revision process, with several indicators updated to reflect more ambitious efforts on our path to net zero, such as the inclusion of 1.5°C-aligned only low-carbon pathways and the alignment of near and long term emissions reduction targets. For the ACT Automotive Manufacturer methodology, the emissions boundaries have been extended to include upstream emissions from purchased materials used for vehicles manufacture (emissions from embedded materials will gain more importance as manufacturers switch production from internal combustion engine to electric vehicles). Since 2021, all companies in the Climate and Energy Benchmark are assessed against 1.5° aligned pathways.

The ACT Automotive Manufacturer and Generic methodologies are structured along 9 modules with different weights that make up the performance scores according to each company's business model's impact on climate change. Some parts of the performance score are given the same weight regardless of the sector covered, typically Module 1 (Targets), Module 5 (Management), and Module 9 (Business model). This allows a consistent approach to some elements of companies' strategy that are not sector-specific and thus a cross-sectoral comparison of assessment results. Modules 2 (Material investments) and 4 (Sold product performance) are defined as communicating vessels: the first one reflects the importance of actions linked to companies' owned assets and production, whereas the second one reflects the importance of indirect activities (such as the use of sold products) and resulting emissions. Modules 3 (Intangible investments) evaluates the R&D investments in mitigation-relevant technologies. Modules 6 and 7 (respectively Supplier and Client engagement) assess the level of engagement that the company has throughout the value chain. Finally Module 8 (Policy engagement) evaluates the

relation of companies with trade associations and their position on climate change policies. For more details about the performance weighting schemes, please refer to the section 6.3 of the ACT Automotive Manufacturer and Generic methodologies.

The ACT methodologies include indicators that align with the information disclosed by companies using CDP, GRI and SASB reporting frameworks. They are also aligned with and support the objectives of the recommendations made by the TCFD. Mappings of alignments on transition plan elements across some frameworks can be found in a CDP paper (p. 5) and a GFANZ paper (p. 61).

Selecting the keystone companies in automotive and transportation manufacturing

WBA applied systems thinking to identify 30 automotive and 14 other transportation manufacturers that exert a significant influence on achieving the SDGs and the Paris Agreement goals (full company list in Appendix I). Our approach draws from prominent academic research inspired by the notion of 'keystone species' in ecology. The most influential companies in an industry act like keystone species in ecosystems, exerting a disproportionate impact on the structure and system in which they operate.

The companies were identified using the following five criteria and principles established by WBA for selecting keystone companies:

1. The company dominates global production revenues and/or volumes in the automotive or transportation manufacture sectors.
2. The company controls globally significant segments of production and/or service provision, based on an assessment of vehicles sold.
3. The company establishes global connections within (eco)systems through subsidiaries and their supply chains.
4. The company wields influence over global governance processes and institutions.
5. The company maintains a global footprint, especially in developing countries.

Next steps

1. WBA will contact all 44 companies in July 2024 to encourage engagement in the benchmarking process. In early Q4 2024, the WBA team will share the ACT and social data/assessment collected from public sources for company validation. Companies will also receive resources on the ACT and social assessments as well as the ATM Benchmark.

2. We strongly encourage companies to participate in the data validation process. We will be on hand to answer any questions raised about the assessment and benchmark process. Appeals on the assessment will only be accepted from companies actively involved in the data validation process.

3. The benchmark results will be published in late Q4 2024.

4. At WBA we intend to contribute to a multi-stakeholder movement. In tandem with the development of the ATM Benchmark, we will therefore be engaging with our global Alliance and a range of stakeholders to build communities of practice and action to take forward the benchmark findings.

If you have questions about the Climate and Energy Benchmark, please reach out to:

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Appendix I: Companies in the 2024 Automotive and Transportation Manufacturers Benchmark

No.	Company name	Headquarter
Automotive Manufacturers		
1	Anhui Jianghuai Automobile Group	China
2	BAIC	China
3	BMW	Germany
4	BYD	China
5	Changan Automobile	China
6	Chery Holding Group	China
7	Dongfeng Motor Group	China
8	FAW	China
9	Ford	United States of America
10	Geely Holding	China
11	General Motors	United States of America
12	Great Wall Motor Company	China
13	Guangzhou Automobile Group	China
14	Honda Motor	Japan
15	Hyundai Motor	Republic of Korea
16	Kia	Republic of Korea
17	Mahindra and Mahindra	India
18	Mazda	Japan
19	Mercedes-Benz	Germany
20	Mitsubishi Motors Corporation	Japan
21	Nissan Motor	Japan
22	Renault	France
23	SAIC Motor	China
24	Stellantis	Netherlands
25	Subaru Corporation	Japan
26	Suzuki	Japan
27	Tata Motors	India
28	Tesla	United States of America
29	Toyota Motor Corporation	Japan
30	Volkswagen AG	Germany
Transportation Manufacturers		
31	Airbus	France
32	Alstom	France

33	Boeing	United States of America
34	China State Shipbuilding	China
35	Comac	China
36	CRRC Corporation	China
37	Daimler Truck	Germany
38	Fincantieri	Italy
39	Hanwha Ocean	Republic of Korea
40	Korea Shipbuilding & Offshore Engineering	Japan
41	PACCAR	United States of America
42	Scania AB	Sweden
43	Stadler Rail	Switzerland
44	Volvo AB	Sweden

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