

Mobility medium and heavy commercial vehicle long-term outlook

Reinventing the Truck 2025

Andrej Divis / Mobility / Executive Director, Global Head of Truck Research

Fellipe Balieiro / Commodity Insights / Energy & Mobility

Greg Genette / Mobility / Principal Research Analyst

Jake Markusic / Mobility / Senior Research Analyst

Victoria Wang / Mobility / Research Analyst

Vishu Garg / Commodity Insights / Research Analyst

November 2025



Report: Reinventing the Truck

S&P Global Mobility MHCV long-term outlook

November 2025

- Scenario-based planning
- Long-term sales and fleet forecasts to 2060
- Answers to key industry questions
- Detailed total cost of ownership models
- Regulatory insights and roadmaps
- Hydrogen market outlook
- Autonomous trucking in the US
- Evaluation of emerging new players
- ...And much more!

Note: MHCV = medium and heavy commercial vehicles
Source: S&P Global Mobility; S&P Global Commodity Insights



Contributors

Mobility MHCV long-term outlook — 2025 update

Andrej Divis	Mobility Executive Director, Global Head of Heavy Truck Research
Fellipe Balieiro	Commodity Insights Director, Energy & Mobility
Greg Genette	Mobility Principal Research Analyst
Jake Markusic	Mobility Research Analyst
Victoria Wang	Mobility Research Analyst
Vishu Garg	Commodity Insights Research Analyst



Introduction

Mobility MHCV long-term outlook — 2025 update

- The updated Reinventing the Truck report by S&P Global Mobility examines the instability and uncertainty of the early to mid-2020s, exploring key questions about the energy transition, which now exhibits greater regional variation than in previous outlooks. The 2025 update navigates an uncertain world marked by geopolitical tensions, tariffs and regulatory uncertainty, posing challenges for the industry across various markets.
- S&P Global Mobility and S&P Global Commodity Insights have brought together automotive and energy experts to identify and address major questions facing the industry.
- Our scenario-based approach aims to demonstrate how economies, the trucking industry, clean energy technology and the policy environment may evolve in various ways throughout the future.



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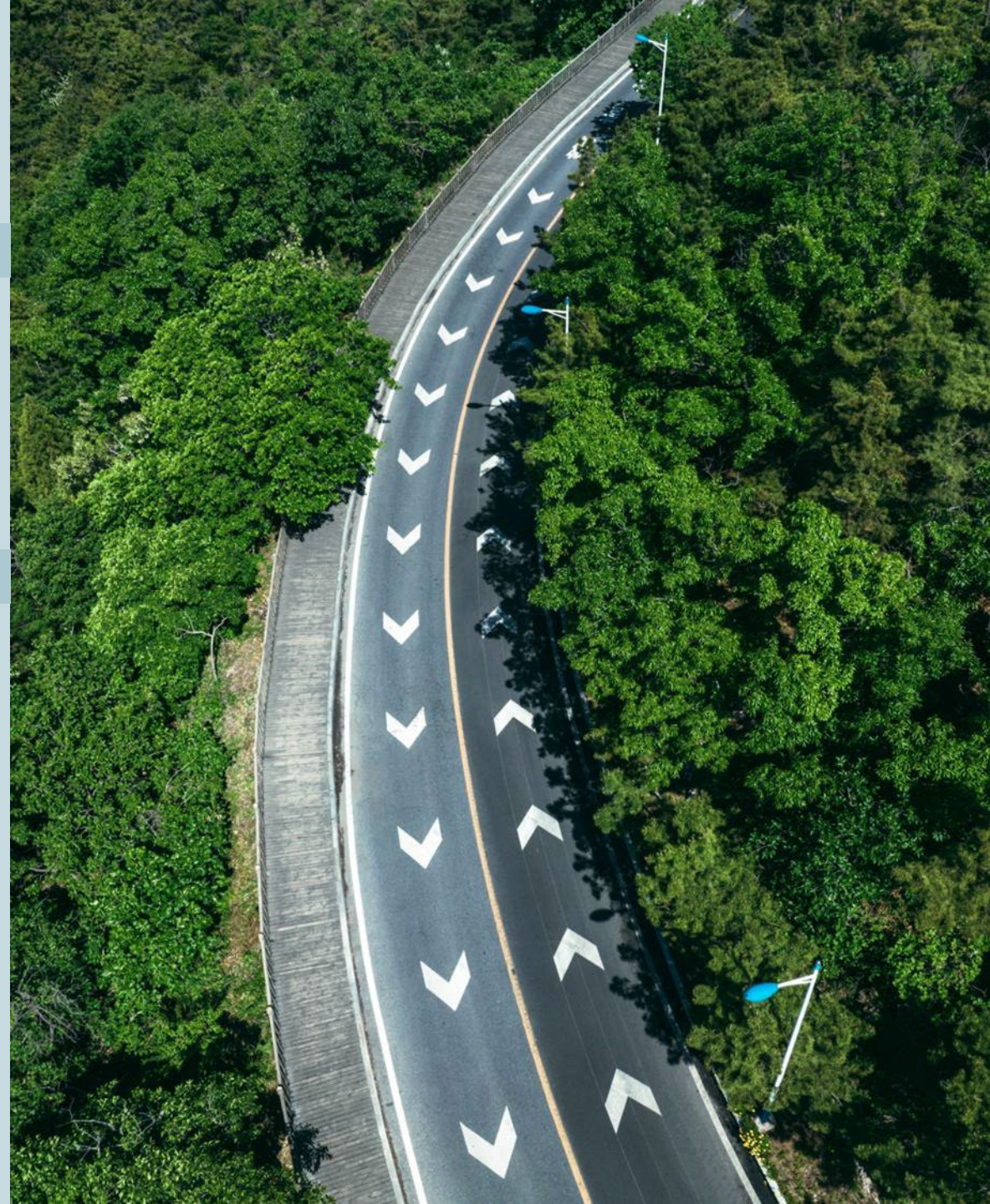
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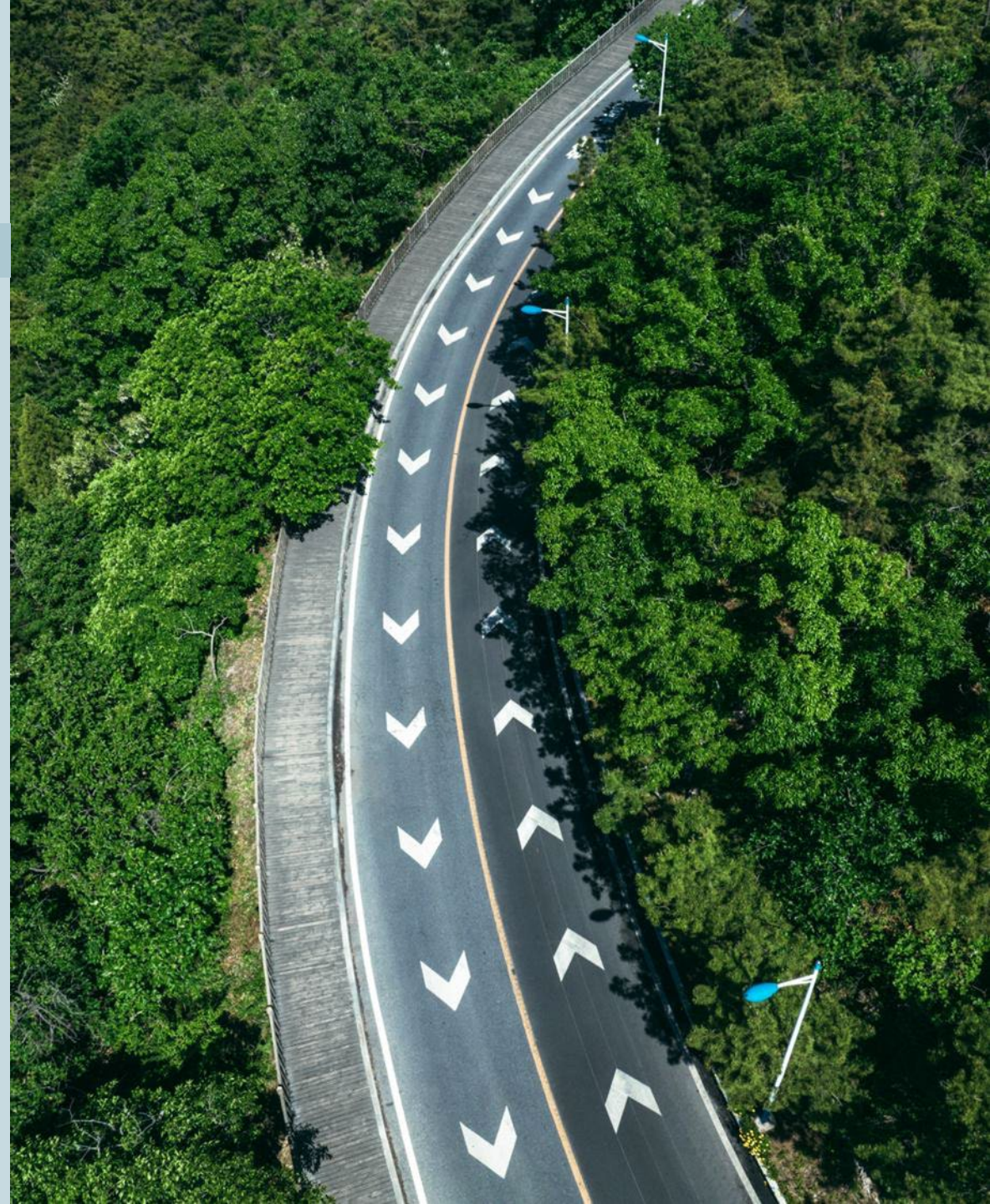
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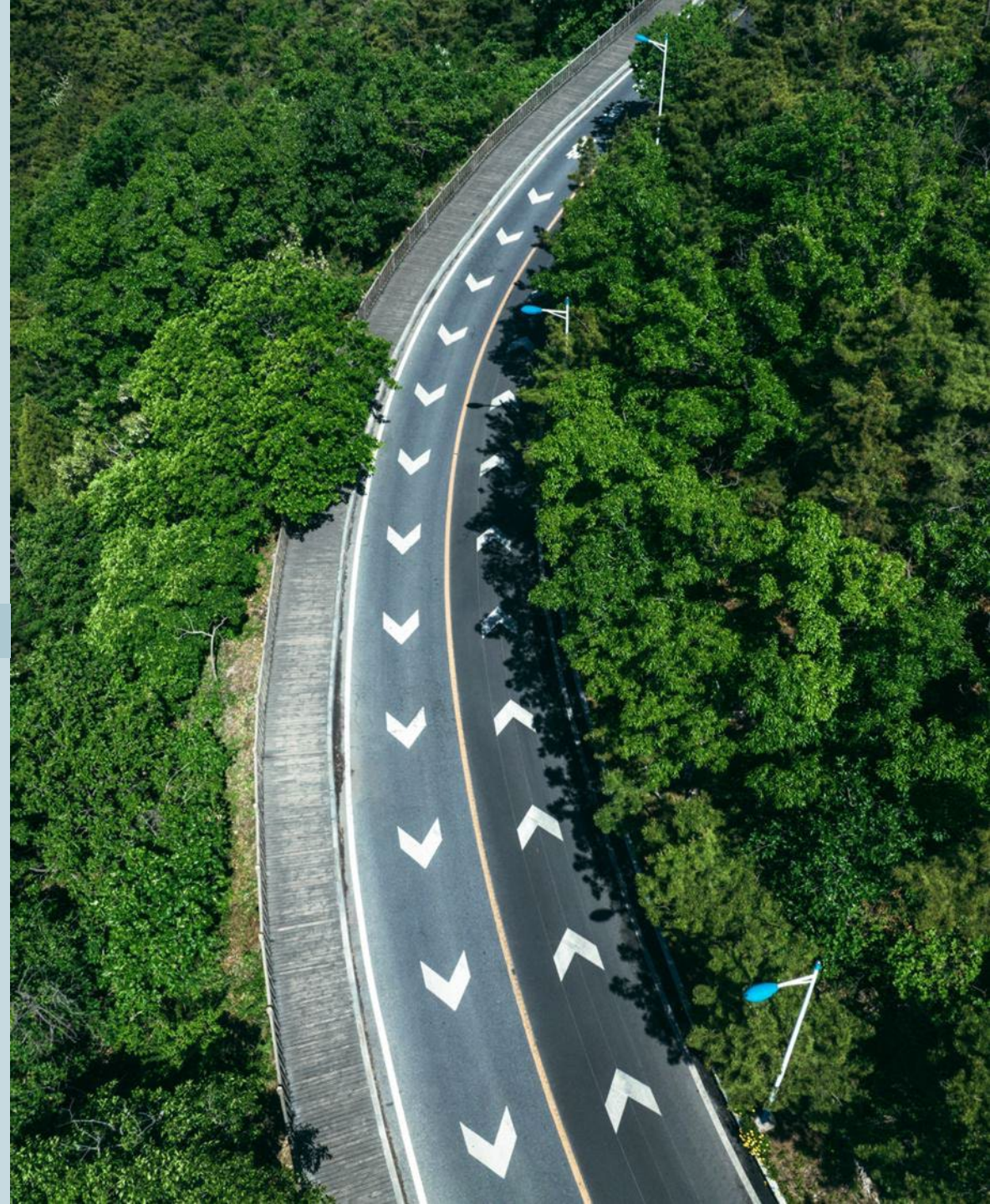
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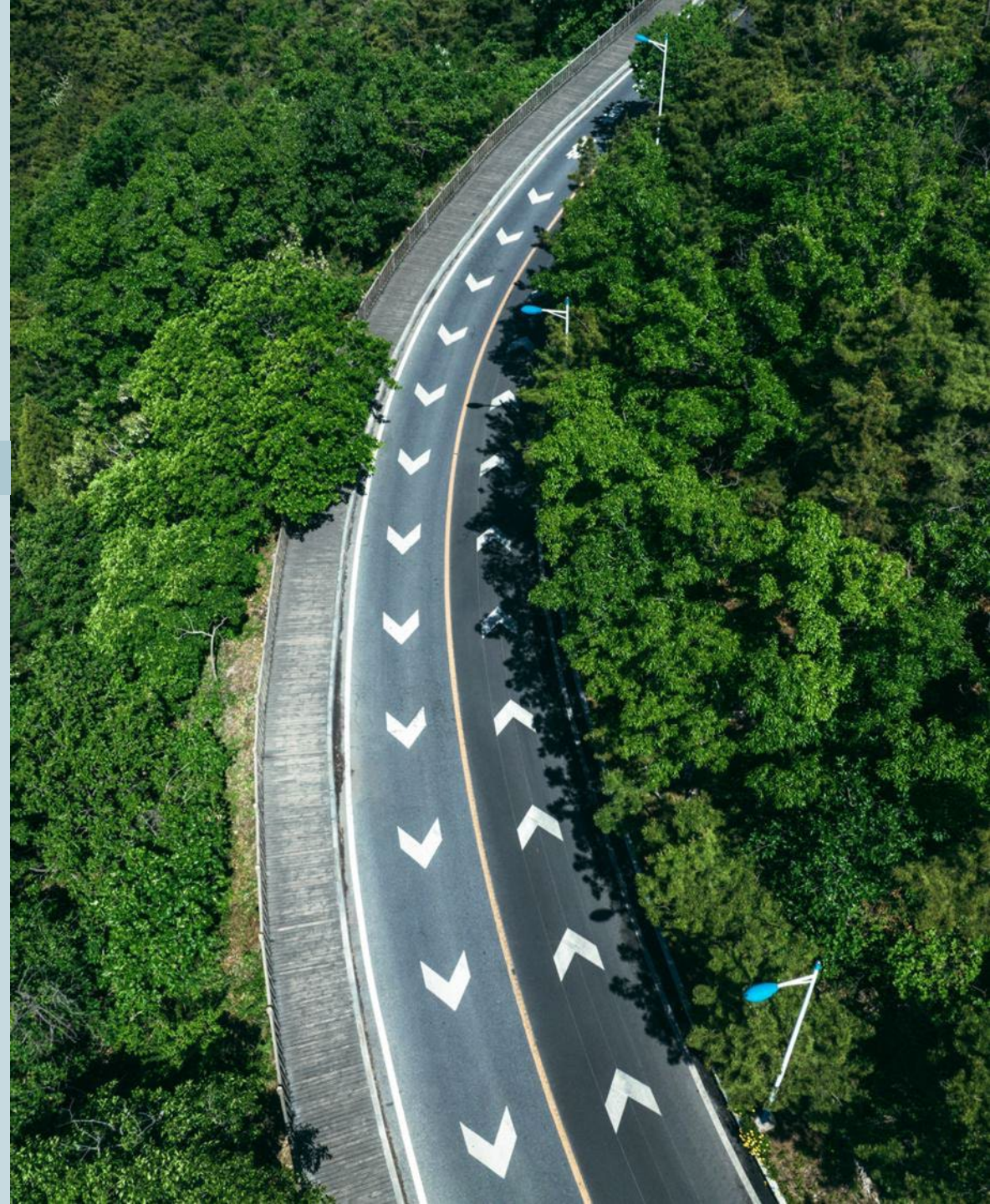
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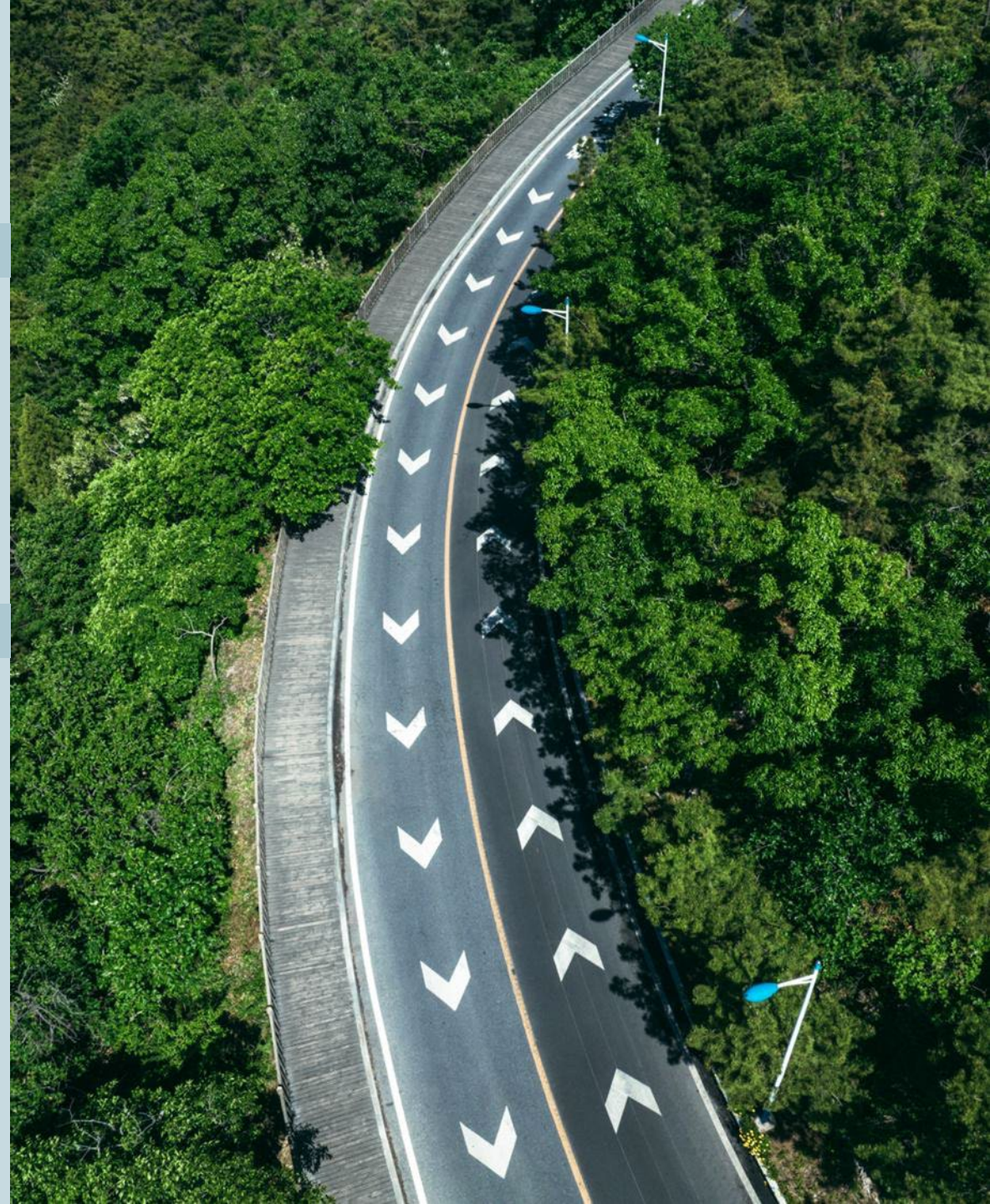
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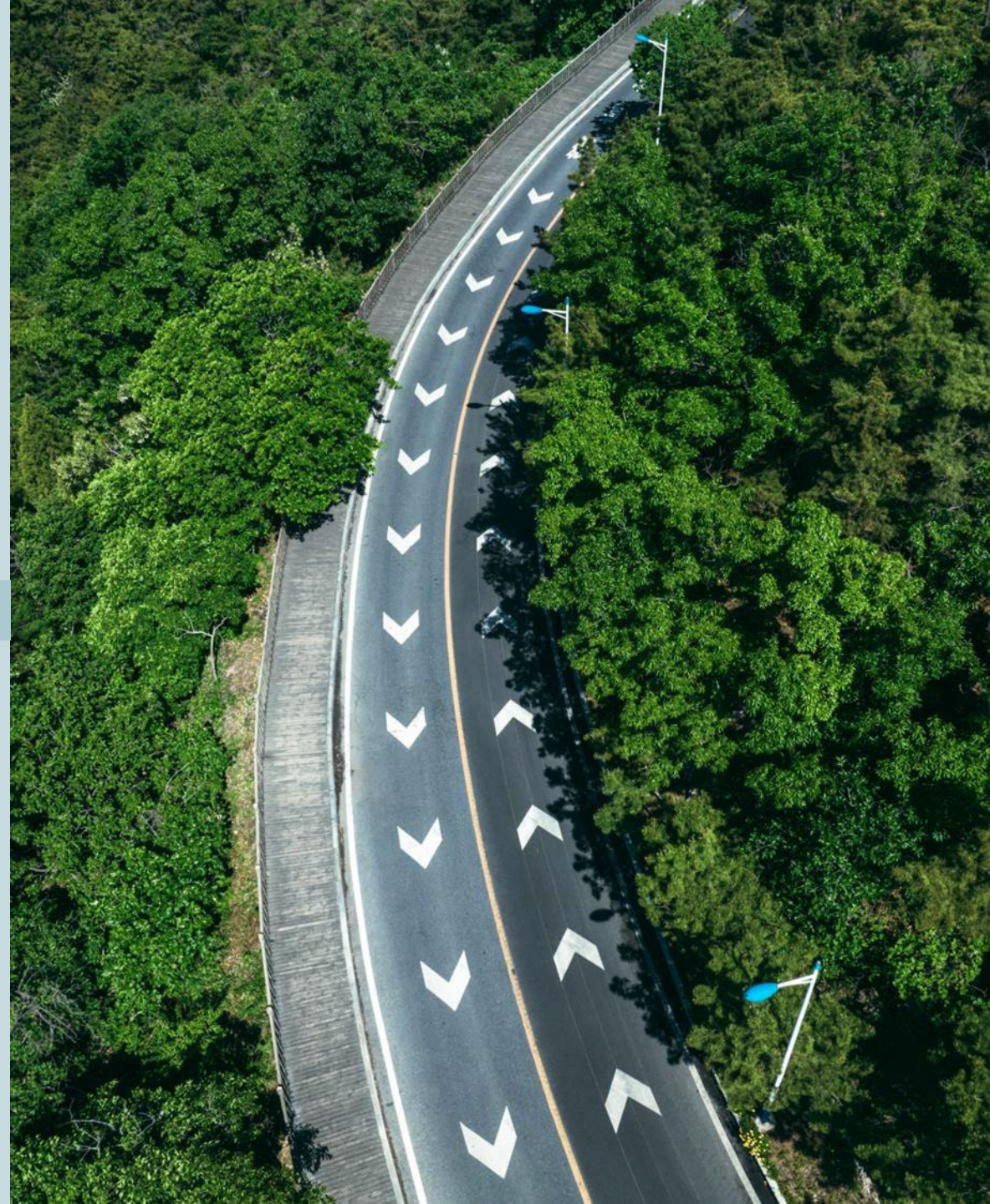
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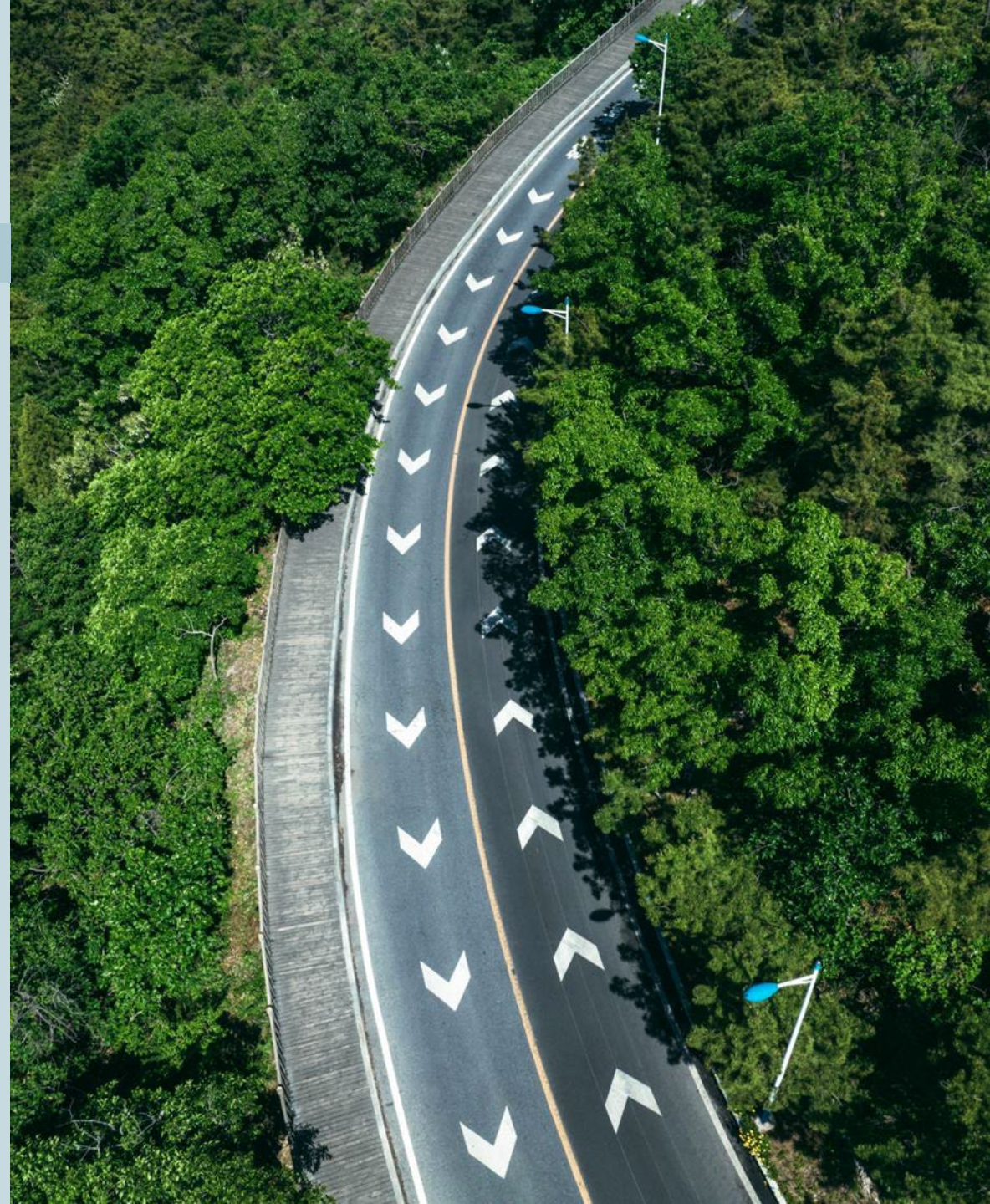
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What is the Reinventing the Truck Study?

S&P Global offers a comprehensive long-term outlook, addressing key questions about the future of trucking

Layers of the 2025 RTT report

Scenario based long term forecast	This report includes two forecast scenarios; our base-case forecasting called Base Case , and an alternative scenario called Renaissance .
Fuel type forecasting to 2060	Time: 2000 to 2060 What: sales and fleet Vehicles: medium and heavy commercial trucks Fuel types: gasoline, hybrid, diesel, natural gas, electricity, hydrogen fuel-cell, hydrogen internal combustion
Detailed total cost of ownership forecasting	Time: 2025 to 2055 What: eight different truck vocations Fuel types: gasoline, hybrid, diesel, natural gas, electricity, hydrogen fuel-cell, hydrogen internal combustion Analysis: answers key question about internal combustion engine and zero-emission truck total cost of ownership parity
Deliverable	<ol style="list-style-type: none">1. The report will be delivered as a PowerPoint deck in PDF format, totaling about 230 slides2. Two excel datasets provide sales and fleet forecasts by fuel type from 2000 to 2060 for Mainland China, Europe, Japan, and the United States

Sources: S&P Global Mobility

Explanation of terms

- **Medium- and heavy-duty trucks:** MHCVs refer to, with some regional nuance, vehicles in the US Department of Transportation's (US DOT's) gross vehicle weight rating (GVWR) categories 4-8 (more than 14,001 lb in the US or 6.0 metric tons in other markets). We exclude from this study bus and motor-home chassis.
- **Medium-duty trucks (MDTs):** Medium or medium-duty vehicles refer to those in US DOT GVWR categories 4-7 (14,001-33,000 lb).
- **Heavy-duty trucks (HDTs):** Heavy or heavy-duty vehicles refer to those in the US DOT GVWR category 8 (more than 33,001 lb).
- The study does not include converters in the forecast, and all volumes are original equipment manufacturer-installed propulsion units.
- To complete the broader work of this study, we had to lock all forecasts for economics and sales in September 2025.

Explanation of terms

S&P Global Mobility and S&P Global Commodity Insights studies

- RTT = Reinventing the Truck

Automotive

- MY = model year
- OEM = original equipment manufacturer
- TCO = total cost of ownership
- TIV = total industry volume
- GVW = gross vehicle weight
- IRA = US Inflation Reduction Act

Truck types

- MHCV = medium and heavy commercial vehicle
- MCV = medium commercial vehicle
- HCV = heavy commercial vehicle
- MDT = medium-duty truck
- HDT = heavy-duty truck
- BEV = battery-electric vehicle
- HEV = hybrid electric vehicle

- PHEV = plug-in hybrid electric vehicle
- FCEV = fuel-cell electric vehicle
- NGV = natural gas vehicle
- ZEV = zero-emission vehicle: battery-electric, fuel-cell electric or H₂-ICE
- NZEV = near zero-emission vehicle REEV = range extender electric vehicle

Fuels

- ICE = internal combustion engine
- CNG = compressed natural gas
- LNG = liquefied natural gas
- LPG = liquefied petroleum gas
- H₂-ICE = hydrogen internal combustion engine
- H₂ = hydrogen
- toe = metric ton(s) of oil equivalent

Policy

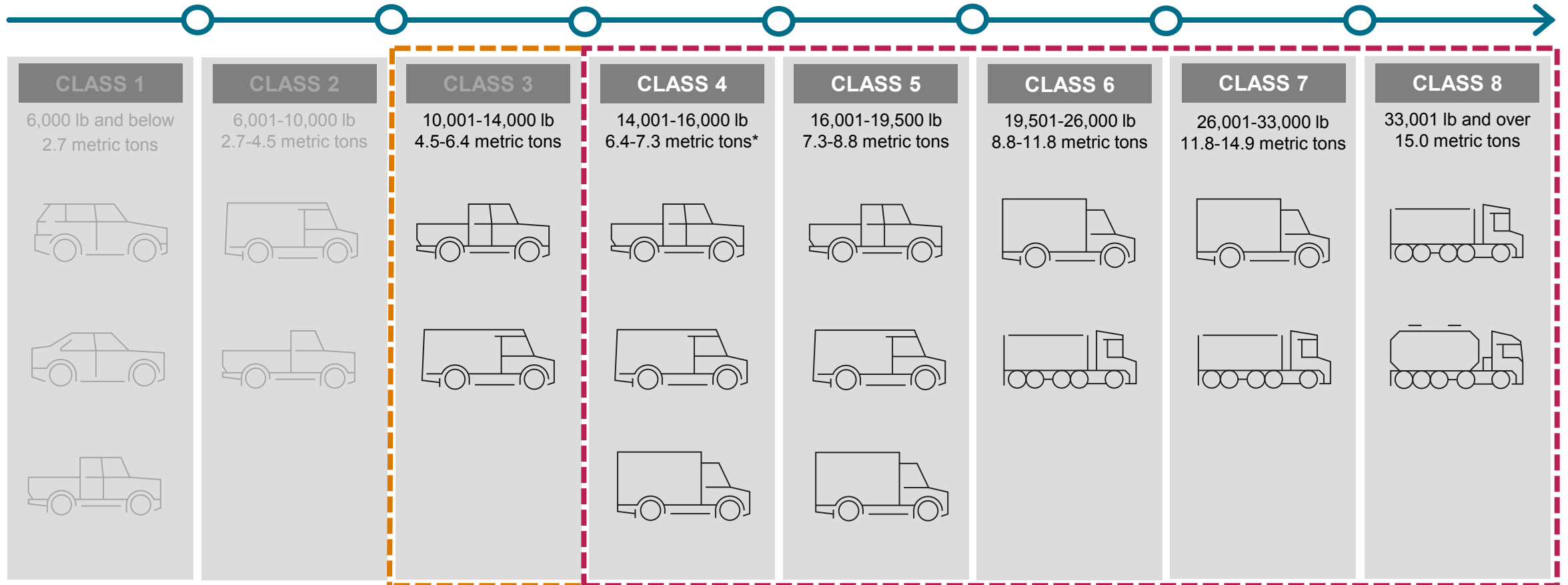
- LEZ = low-emission zones
- ZEVZ = zero-emission vehicle zones
- CO₂ = carbon dioxide

Data compiled November 2025.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

Vehicle segments included in the RTT forecast

Globally, the MHCV segment starts at over 6.0 metric tons; the RTT 2025 forecasts exclude buses



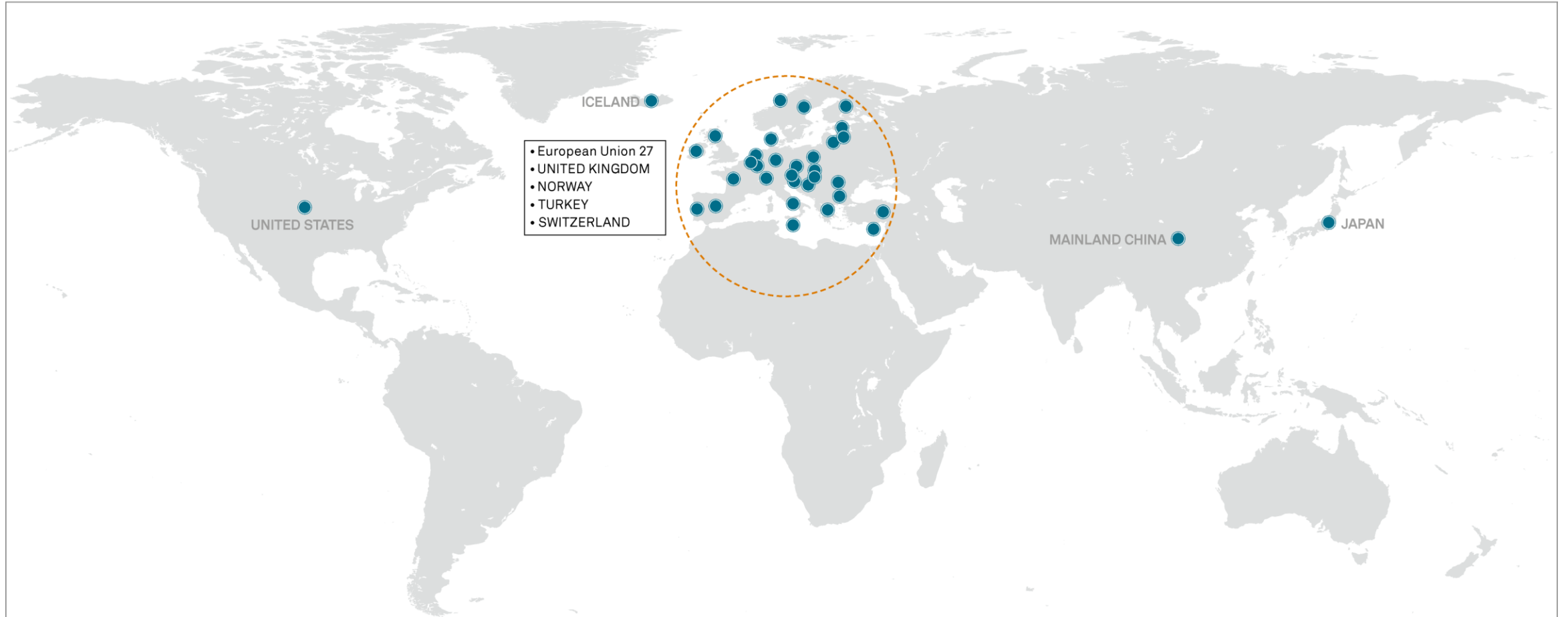
Data compiled November 2025.

* In the US, we apply the strict 6.4-7.3 metric tons classification. Elsewhere, though, we use 6.0-7.3 metric tons to align with the international practice limiting light vehicles to =< 6.0 metric tons.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

RTT markets made up 63% of truck sales in 2024, a drop from pre-COVID-19 levels due to lower recent volumes in mainland China

Markets included in the Reinventing the Truck study



Data compiled Aug. 4, 2025.

Source: S&P Global Mobility: IC-251427-01.

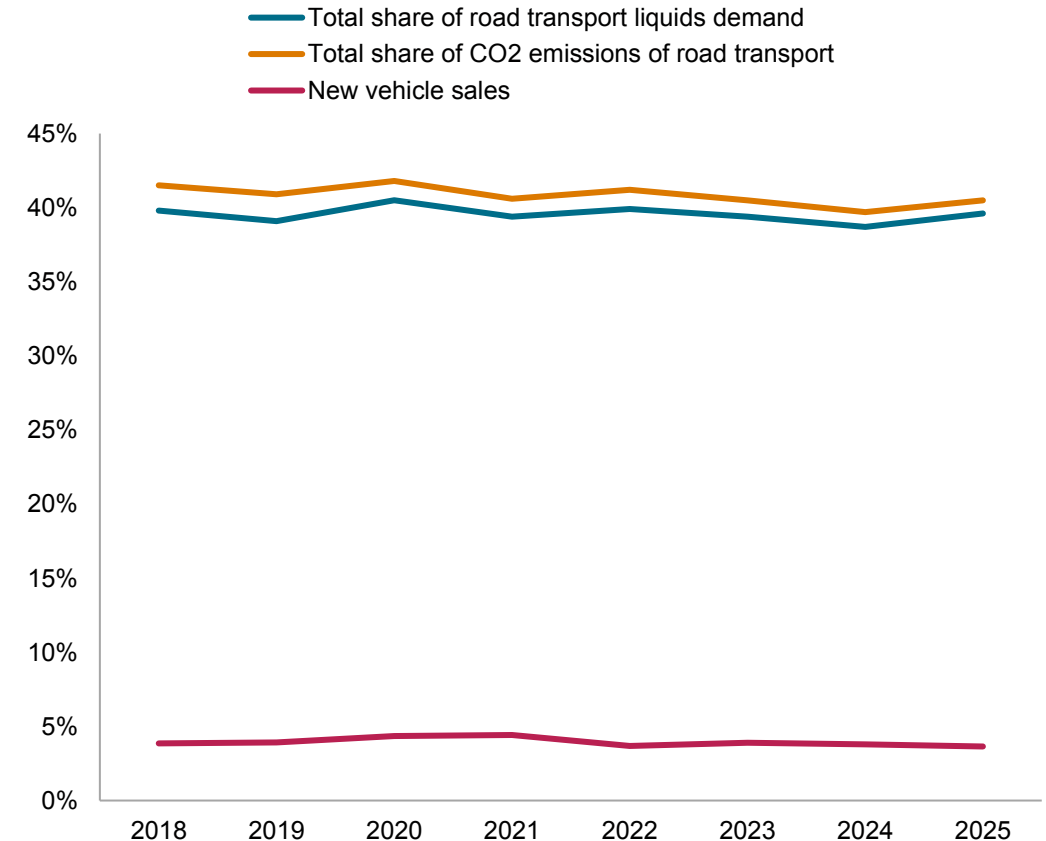
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Individual European countries are not split out in the analysis or any of the forecasts.

Trucking is a key pillar of the global energy transition, accounting for about 40% of total CO₂ emissions from on-road transport in 2024

- Governments around the world must rely on the rollout of zero-emission trucks to support their climate and energy targets.
- Despite accounting for just 3.8% of global vehicle sales in 2024, MHCVs are a large contributor to on-road CO₂ emissions due to their high miles traveled, low fuel economy and long active life.
- In 2025, MHCVs are projected to account for 39.6% of global road transport liquid fuel demand and 40.5% of global road sector CO₂ emissions.

MHCV global share of various climate metrics



Data compiled November 2025.

MHCVs in this context include buses and motor homes. Vehicle sales only includes light vehicles, commercial vehicles and MHCVs, excluding three-wheelers.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

The new scenarios have evolved from earlier outlooks; governance and technology are key factors driving this year's narratives

S&P Global Energy and Climate Scenarios used in the MHCV long-term outlook

2024 outlooks

2025 outlooks

Inflections

----- Direct successor ----->

Base Case 2025

A world navigating the instability of the early to mid-2020s while trying to enable an energy transition. Electrification advances, but with ongoing challenges and greater regional variation than in previous outlooks.

Green Rules

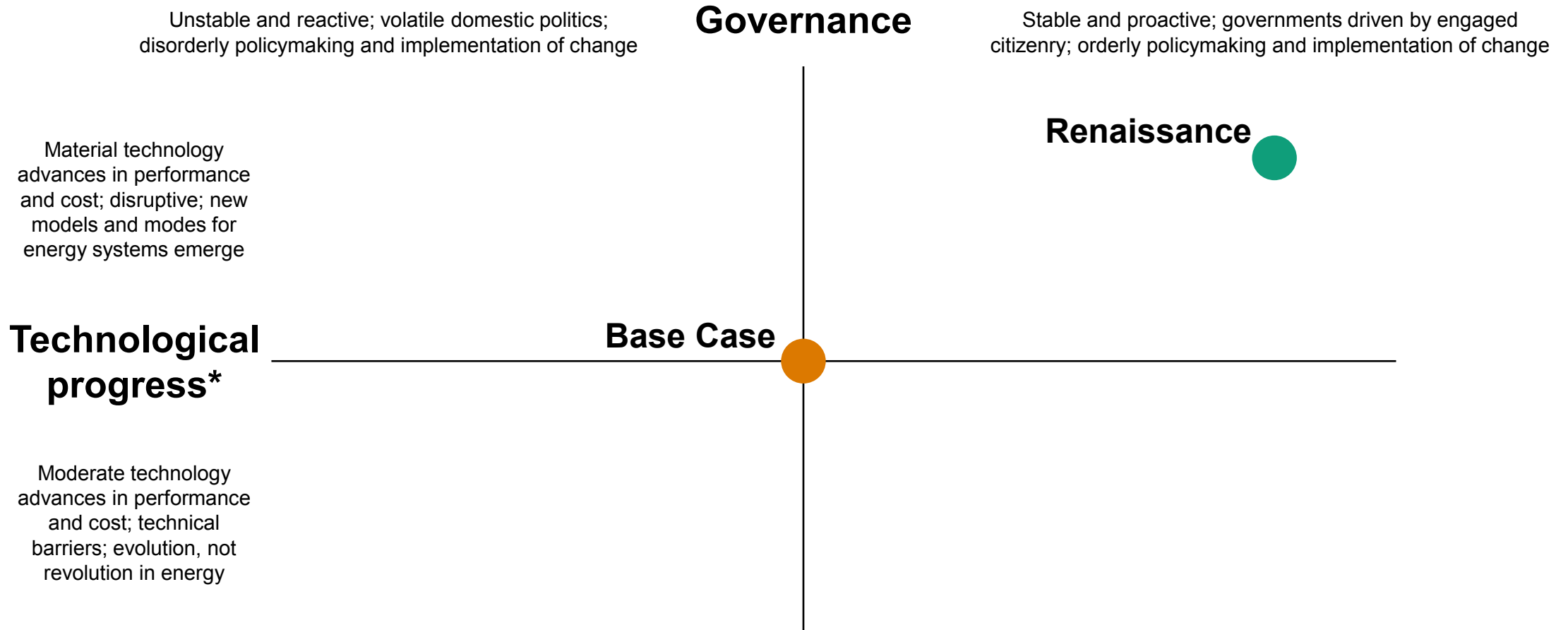
----- Indirect successor ----->

Renaissance

Disrupted by the chaos of the 2020s, the energy transition in Western markets initially lags expectations but later accelerates. Mainland China remains the clean energy leader, though growing competition from emerging markets fuels technological abundance.

Data compiled November 2025.
Sources: S&P Global Mobility; S&P Global Commodity Insights.

Two new scenarios emerged from the updated narratives exploring how technology and governance shape the trucking industry's future









Data compiled November 2025.

* From 2024 levels.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

Several scenario narratives have changed or have been added since last year's outlook, with a few notable ones potentially impacting the trucking industry

New scenario narratives

	<p>The US lags in developing and adopting clean energy technologies, including battery-electric trucks. It turns inward, prioritizing domestic industry over clean energy initiatives, especially in the next five years.</p>
	<p>The European Union is expected to ease climate regulations, including de facto ICE bans, as priorities shift to domestic challenges. Current CO₂ targets are not the main driver of this forecast; the Base Case is not a compliance-driven ZEV outlook.</p>
	<p>The turmoil of the early to mid-2020s delays the global energy transition, as key markets like the US and Europe turn inward to address domestic challenges.</p>
	<p>In the Renaissance scenario, the energy transition starts slower than last year's alternative "Green Rules" scenario, with greater regional variation. Later in the forecast, it accelerates due to global cooperation, AI, emerging markets, and renewed focus on climate from the US.</p>
	<p>Emerging markets grow faster than expected, especially in the Renaissance scenario. The US may ease trade restrictions to access these markets and more easily source affordable clean technology from others beyond mainland China.</p>
	<p>AI is featured more prominently in this year's scenarios, albeit qualitatively. It has the potential to boost economic efficiency and accelerate R&D in clean energy technology and autonomous driving.</p>






Data compiled November 2025.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

Total cost of ownership is a key metric closely monitored by the industry, and the data is particularly useful for long-term forecasting

Key messages:

- A full total cost of ownership forecast is included in the RTT 2025 study.
- Any new regulations have been implemented into the modeling input variables, such as purchase cost and fuel efficiency.
- The total cost of ownership forecast includes analysis of eight different vocations; four medium duty (class 4-7) and four heavy duty (class 8).

What	Included in RTT 2025?
The ability to analyze the TCO for seven different vocations	
H ₂ ICE is included in the TCO modeling as a fuel type	
Purchase cost & fuel efficiency mapped to all regulations	
Analysis of TCO input variables are included in the report	
<i>New:</i> class 8 refuse truck included in the TCO forecast	

What questions will the TCO forecast answer?

- Battery-electric or fuel-cell electric? Which will be the better zero-emission option?
- Will work trucks be able to adopt zero-emission technology? Battery-electric or fuel-cell electric?
- What are the regional differences in total cost of ownership economics between mainland China, Europe, Japan and the United States?
- When will parity be met between battery-electric trucks and diesel trucks? What about parity between fuel-cell electric trucks and diesel trucks?
- What are the expected purchase costs for zero-emission trucks? Will they ever be less expensive than diesel trucks?
- What is the current outlook for all fuel types? Will there be a long-term impact on diesel costs because of the geopolitical situation in Europe?
- What is the expectation for total cost of ownership of a H2-ICE?

Sources: S&P Global Mobility.

With small profit margins in many sectors of the industry, market participants are sensitive to changes in the cost structure of their purchases

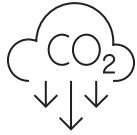
- Predicting regulations over the mid to long term is challenging when developing a long-term forecast. As a result, TCO becomes a key factor in forecasting for electric and hydrogen trucks.
- Several key factors drive fleet decision-making on buying patterns and technology adoption, with cost being crucial in this low-margin industry.
- In this report, we define TCO as the costs associated with purchasing, operating, maintaining and reselling the truck over a six-year period.
- The purchase cost buildup and forecast for all fuel types is “cost plus.” This means the assumed purchase cost captures all product costs for manufacturing and selling trucks. Included in the purchase cost is a profit for the OEM. Even with new technology, it is expected that OEMs and new electric vehicle OEMs (startups) will have to start generating profits from new technology to pay for R&D.
- We acknowledge that incentives and subsidies are available in various global markets to alleviate the high purchase costs associated with new battery-electric and fuel-cell electric trucks. However, we do not include them in any of the TCO modeling for various reasons, such as:
 - To make the actual product cost pressure visible for this new technology (BEVs and FCEVs)
 - To be able to compare across regions and across the forecast horizon
 - Future incentives and subsidies are unknown
 - To provide results that are a true representation of the TCO economics

Sources: S&P Global Mobility; S&P Global Commodity Insights.

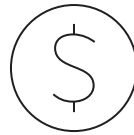
Several major factors drive fleet decision-making, particularly given the diverse vocations and end-use cases in the trucking market

There are several major drivers of fleet decision making

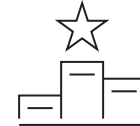
Environmental footprint



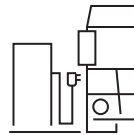
Cost



Competitiveness



Infrastructure



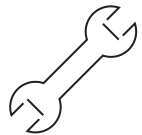
Brand loyalty



Suitability



Reliability



Dealer relationships



Comfort

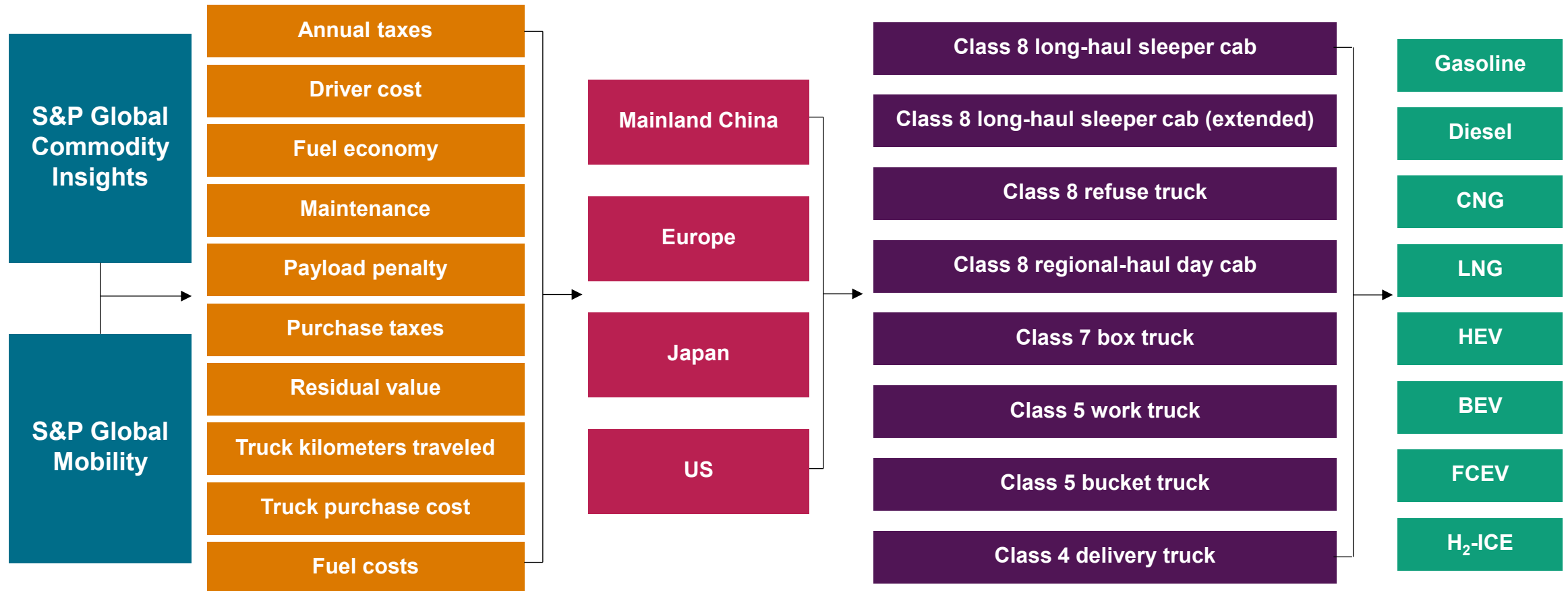


Safety



Sources: S&P Global Mobility; S&P Global Commodity Insights.

The detailed structure of the TCO modeling allows for greater insights and more informed long-term forecasting



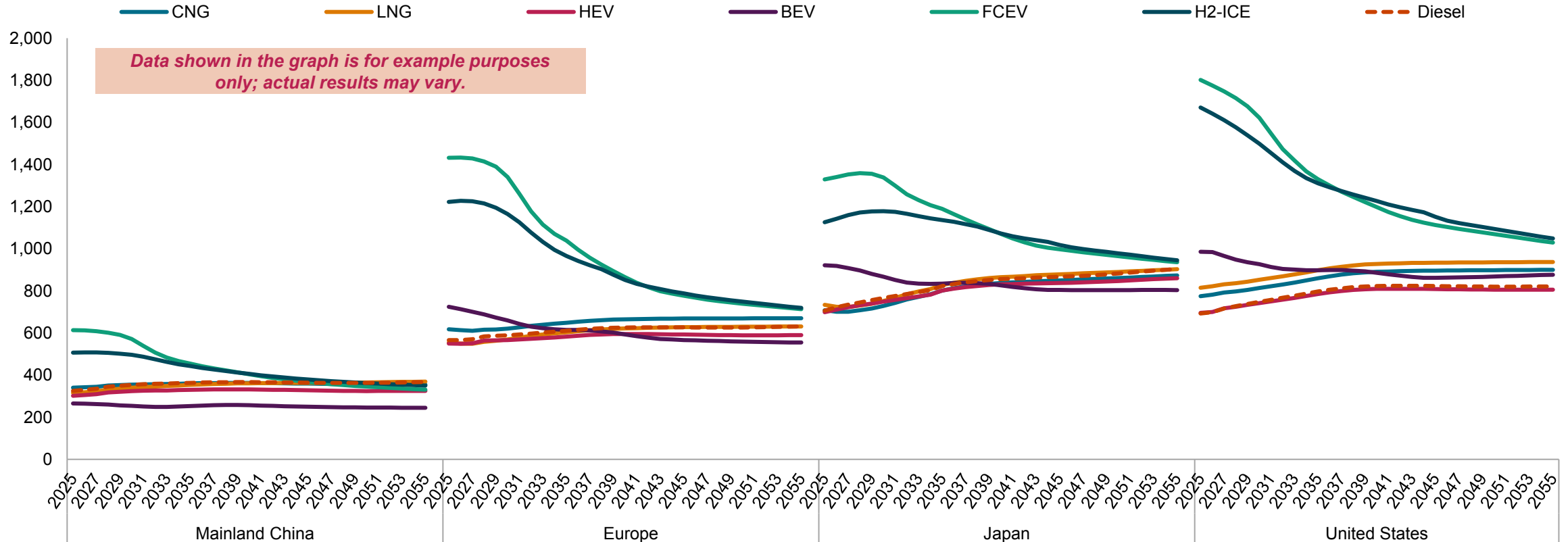
Data compiled November 2025.
Sources: S&P Global Mobility; S&P Global Commodity Insights.

Total cost of ownership forecast by fuel type

Base Case: Class 8 regional haul day cab

Example: Base Case: Class 8 regional haul day cab TCO forecast

2024 \$ thousands, 6-year ownership



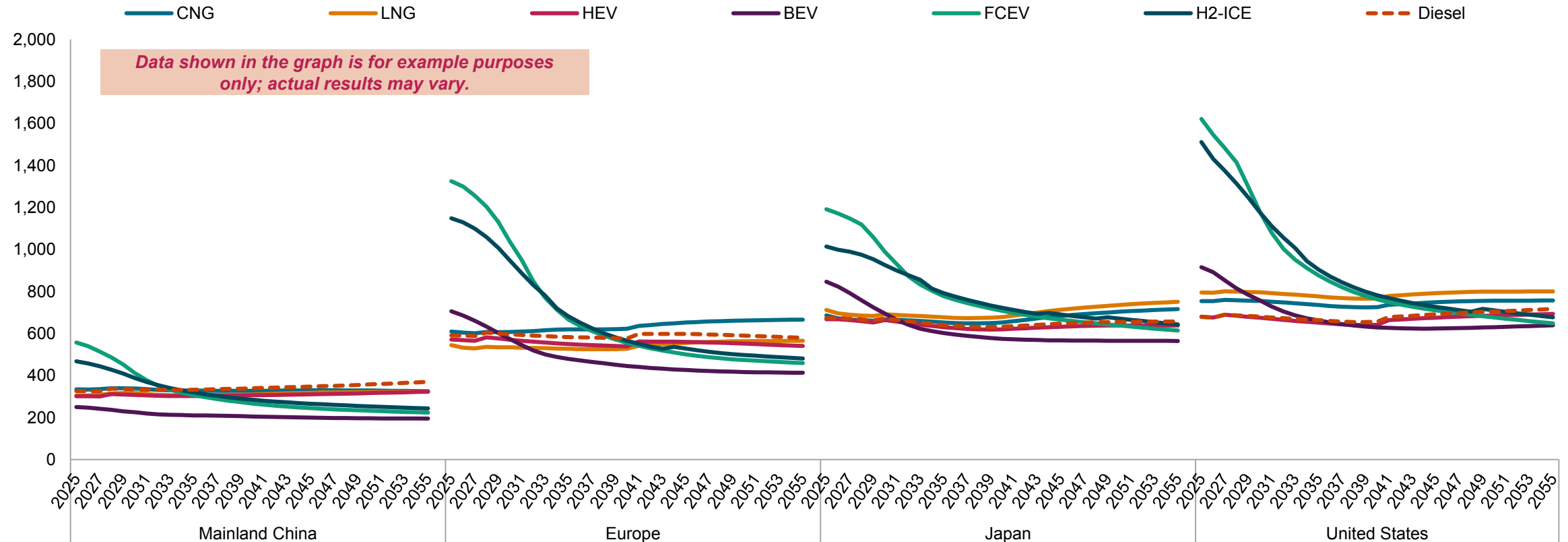
Data compiled November 2025.
 HEV = average of PHEV and HEV.
 Sources: S&P Global Mobility; S&P Global Commodity Insights.

Total cost of ownership forecast by fuel type

Renaissance: Class 8 regional haul day cab

Example: Renaissance: Class 8 regional haul day cab TCO forecast

2024 \$ thousands, 6-year ownership



Data compiled November 2025.
 HEV = average of PHEV and HEV.
 Sources: S&P Global Mobility; S&P Global Commodity Insights.

Excluding incentives, TCO parity: BEVs versus diesel trucks for all four RTT markets

Data in table = not actual results, meant for example purposes only

	Base Case				Renaissance			
Fuel type: battery-electric	Mainland China	Europe	Japan	United States	Mainland China	Europe	Japan	United States
Class 4 delivery truck	Currently	2025	2035	2025	Currently	Currently	2029	2025
Class 5 bucket truck	2028	2026	2030	NA	Currently	2028	2030	2026
Class 5 work truck	2030	2026	2040	2042	2025	2029	2028	2030
Class 7 box truck	2025	2036	2029	2028	2028	2027	2028	2025
Class 8 refuse truck	2028	2039	2029	2028	2029	2027	2025	2027
Class 8 long-haul sleeper cab, extended range	2035	NA	NA	2030	2029	2033	2025	2033
Class 8 long-haul sleeper cab	2030	NA	2041	2040	2025	2031	2030	2031
Class 8 regional-haul day cab	2035	2042	2036	2035	2027	2030	2028	2029

Data compiled November 2025.

NA = not applicable and, the forecast does not show cost parity with diesel before 2055.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

Excluding incentives, TCO parity: FCEVs versus diesel trucks for all four RTT markets

Data in table = not actual results, meant for example purposes only

Fuel type: battery-electric	Base Case				Renaissance			
	Mainland China	Europe	Japan	United States	Mainland China	Europe	Japan	United States
Class 4 delivery truck	Currently	2025	2035	2025	Currently	Currently	2029	2025
Class 5 bucket truck	2028	2026	2030	NA	Currently	2028	2030	2026
Class 5 work truck	2030	2026	2040	2042	2025	2029	2028	2030
Class 7 box truck	2025	2036	2029	2028	2028	2027	2028	2025
Class 8 refuse truck	2028	2039	2029	2028	2029	2027	2025	2027
Class 8 long-haul sleeper cab, extended range	2035	NA	NA	2030	2029	2033	2025	2033
Class 8 long-haul sleeper cab	2030	NA	2041	2040	2025	2031	2030	2031
Class 8 regional-haul day cab	2035	2042	2036	2035	2027	2030	2028	2029

Data compiled November 2025.

NA = not applicable and, the forecast does not show cost parity with diesel before 2055.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

In the previous long-term outlook, we listed market downside risks, some of which have already occurred or are expected, primarily in the US

RTT markets — Downside risks

Mainland China	Europe	Japan	US
ZEV TCO increases vs. expectations	Delay or change in CO₂ reduction targets	Hydrogen fuel costs do not decrease	Electricity grid and infrastructure rollout
Hydrogen fuel costs do not decrease	Infrastructure rollout, AFIR	ZEV purchase and fuel costs stay high	Individual states delay or abandon ACT rules
Economic growth significantly slows	Government incentives or subsidies stop		Federal GHG Phase 3 regulation changes
Infrastructure develop limit BEV growth	Hydrogen fuel costs do not decrease		Impacts from the 2024 US election
	Costs become too high for the industry		Hydrogen fuel costs do not decrease
	OEMs increase fuel efficiency more than expected		Costs become too high for the industry
	Electricity grid		Government incentives or subsidies stop
			California's regulatory waiver

Happened / occurred already

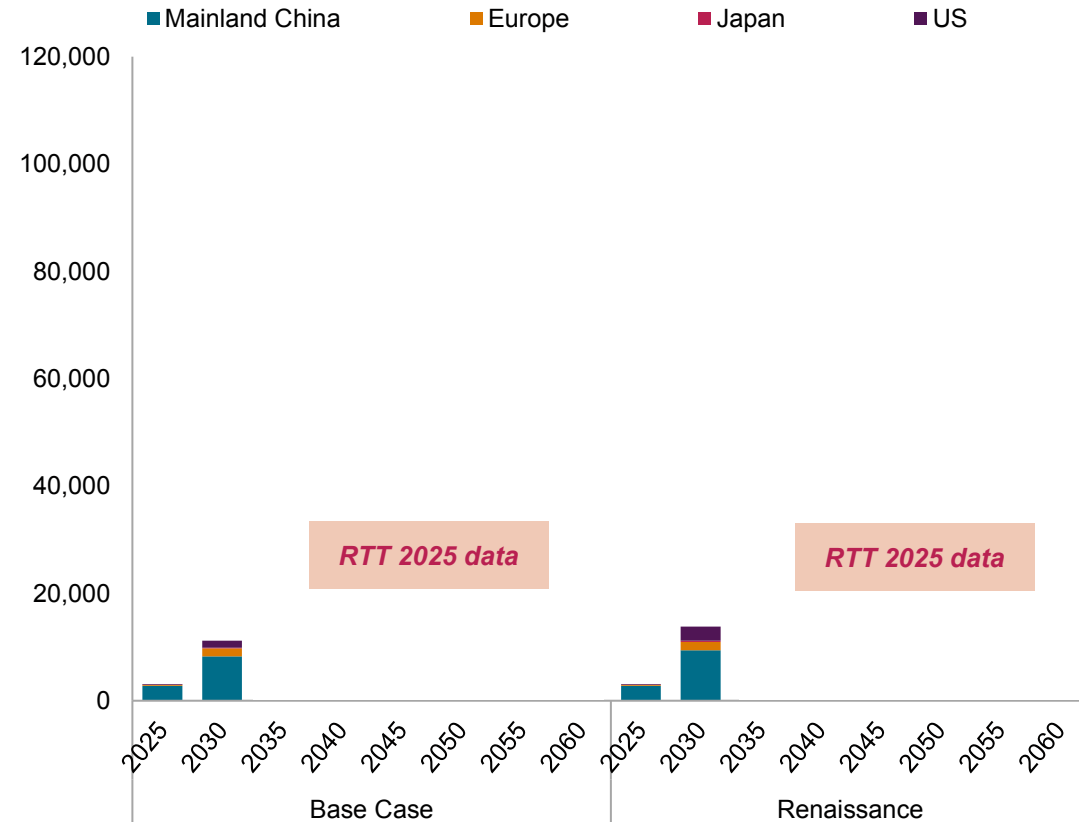
Expected to happen / mounting evidence

Data compiled November 2025. Sources: S&P Global Mobility; S&P Global Commodity Insights.

By 2060, over [REDACTED] truck chargers will be needed across RTT markets; efficiency improvements reduce this requirement in the Renaissance scenario

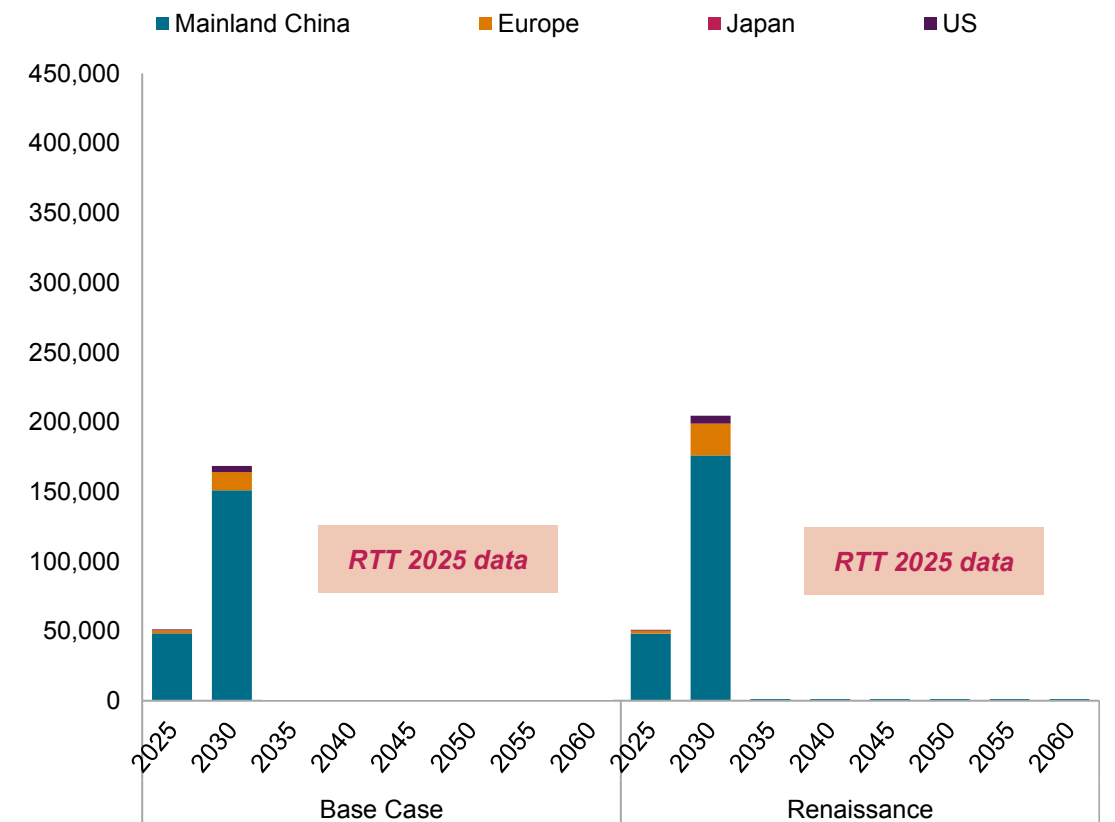
BEV Chargers required to support the forecast for MDTs, RTT markets

60% charger utilization rate assumed



BEV Chargers required to support the forecast for HDTs, RTT markets

60% charger utilization rate assumed

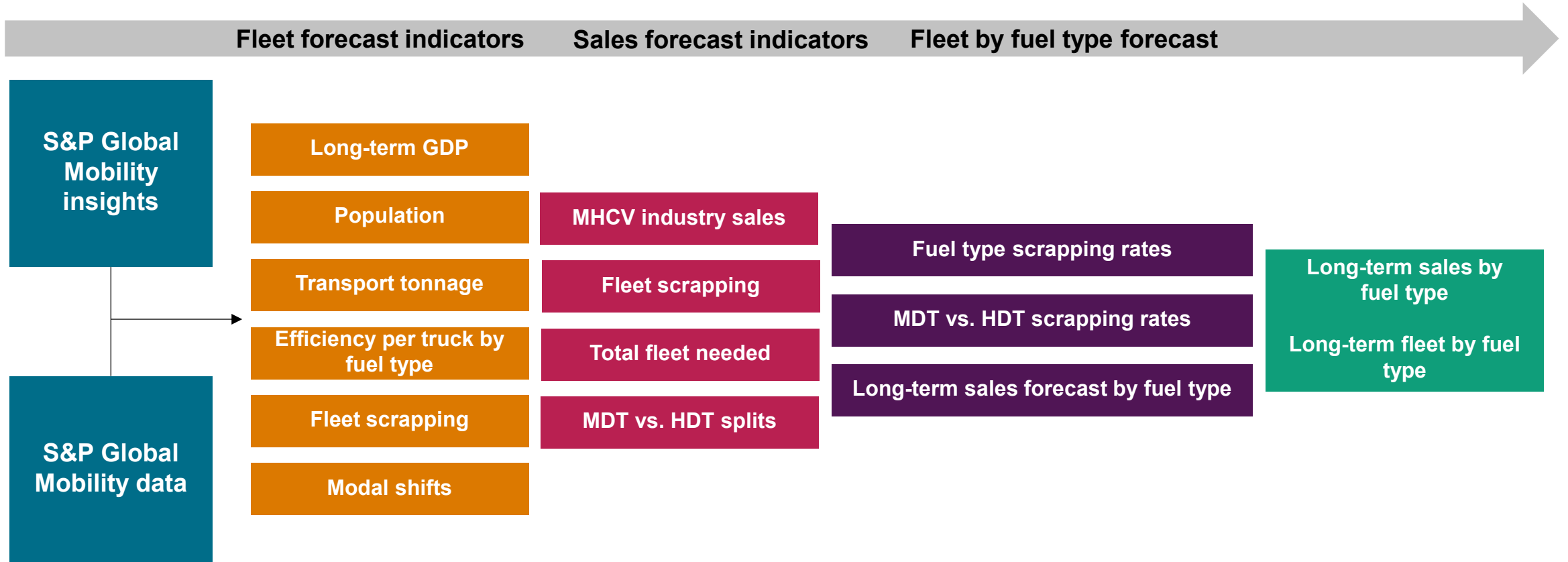


Data compiled November 2025.

This forecast for both scenarios assumes a 60% utilization rate of a BEV charger.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

The RTT fleet and sales forecasts consider a variety of indicators, including industry operating efficiency, modal shifts, economic forecasts and scrapping

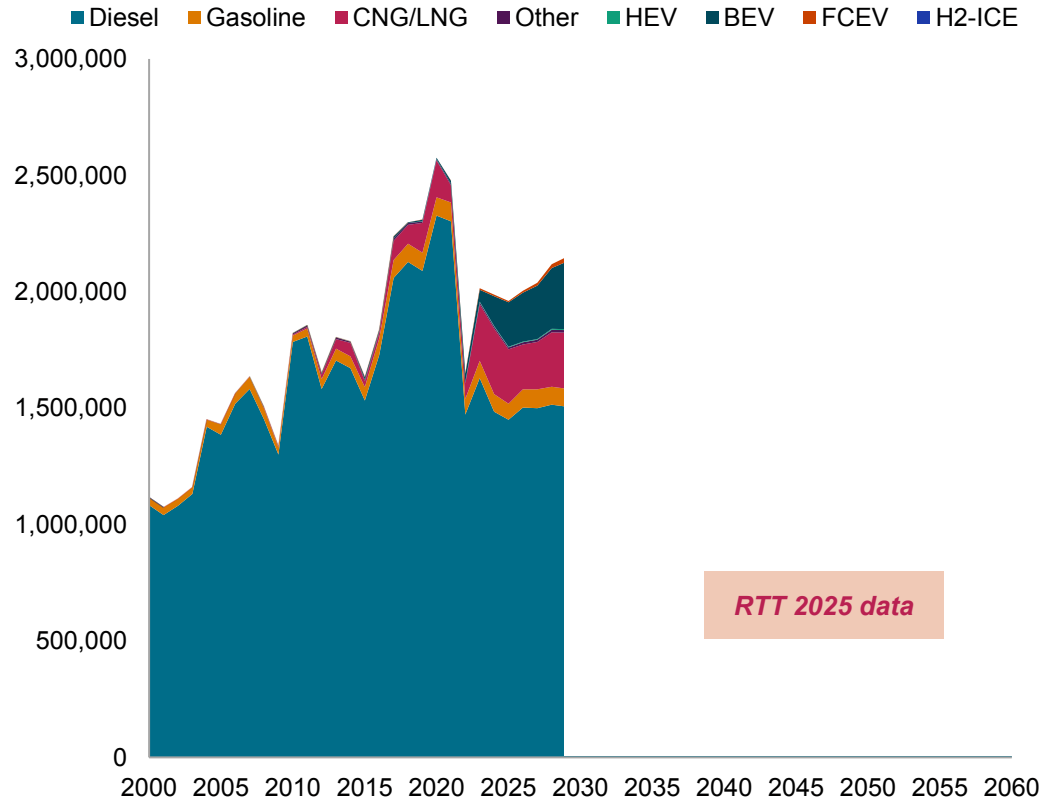


Data compiled November 2025.
Sources: S&P Global Mobility; S&P Global Commodity Insights.

In the Renaissance forecast, ICE trucks are expected to account for ████% of sales by 2060, a shift from last year's alternative scenario forecast assumptions

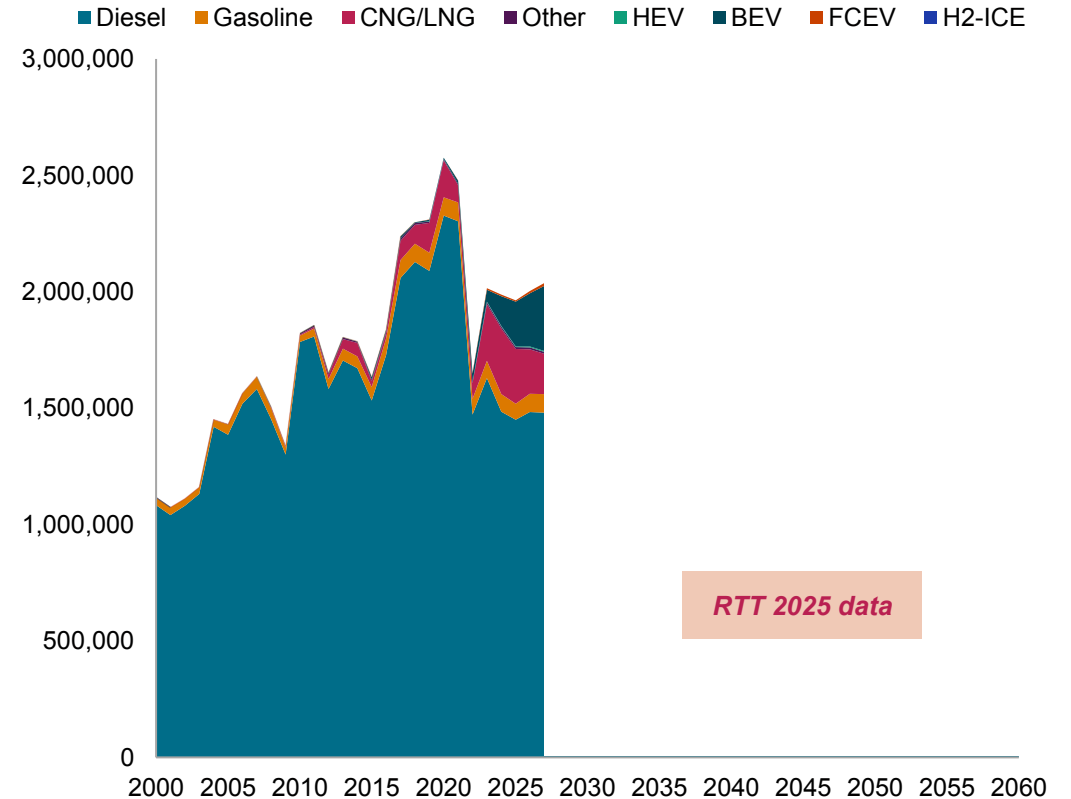
Base Case scenario total sales by fuel type

Mainland China, Europe, Japan, US



Renaissance scenario total sales by fuel type

Mainland China, Europe, Japan, US

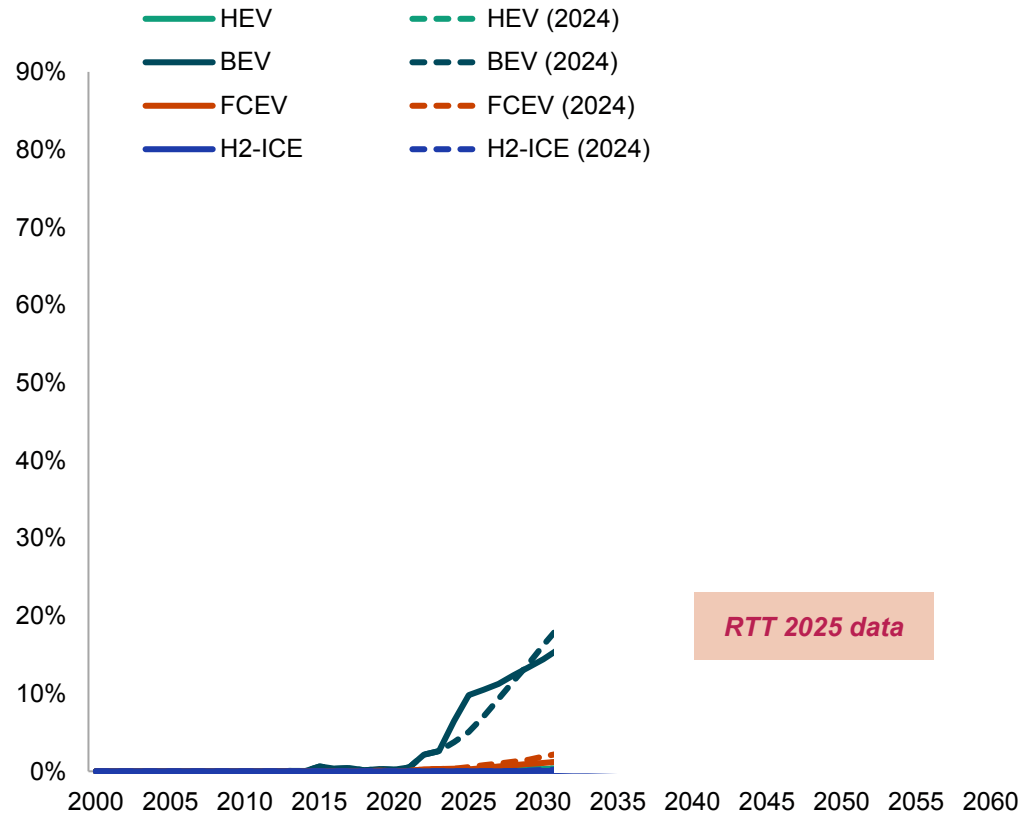


Data compiled November 2025.
Sources: S&P Global Mobility; S&P Global Commodity Insights.

In the short term, BEV forecast declines in the EU and US are offset by increases in mainland China, while the FCEV forecast has declined in both scenarios

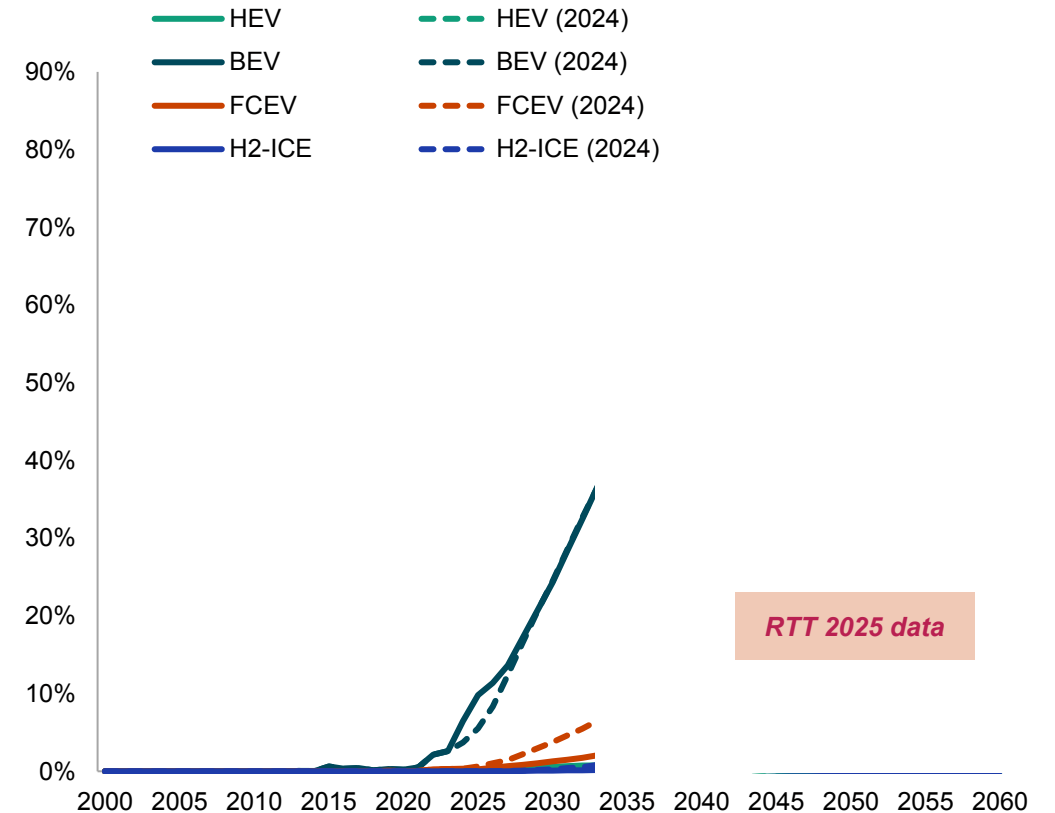
Base Case total truck sales share by alternative powertrain

Mainland China, Europe, Japan, US



Renaissance total truck sales share by alternative powertrain

Mainland China, Europe, Japan, US



Data compiled November 2025.

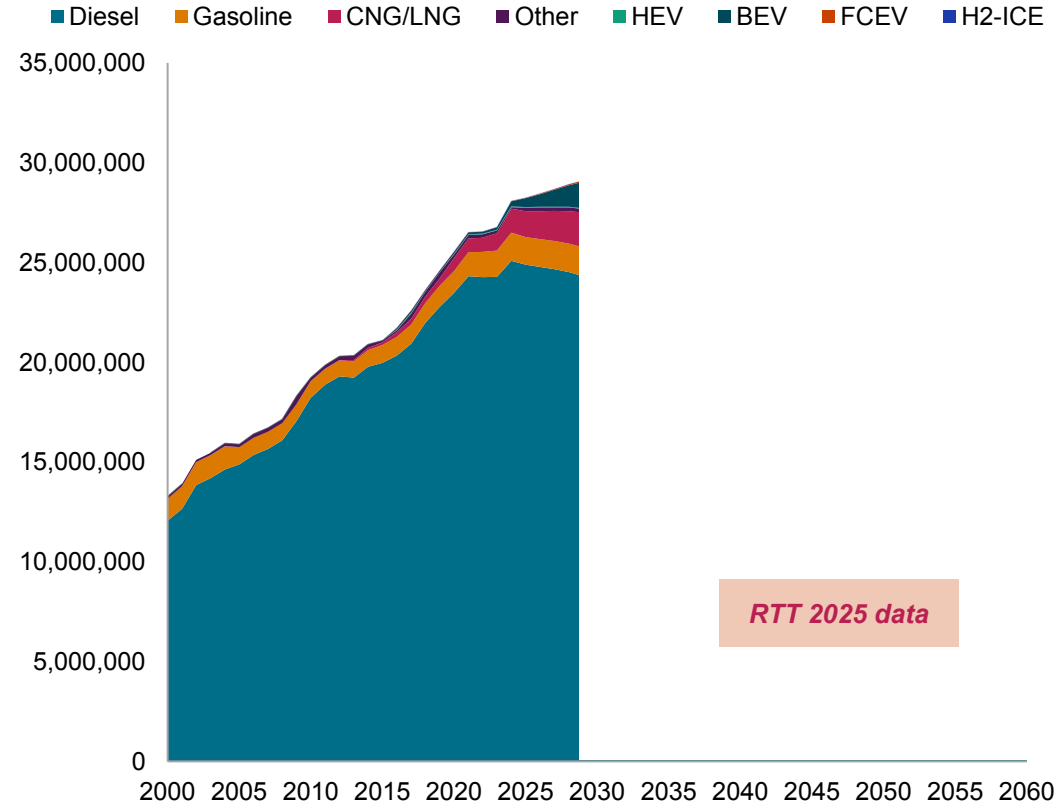
2024 comparison labels: Base Case is compared with the 2024 Inflections scenario; Renaissance is compared with the 2024 Green Rules scenario.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

In the Base Case scenario, almost █████ of the trucks in the RTT markets are expected to be powered by ICEs; in the Renaissance scenario, this drops to █████%

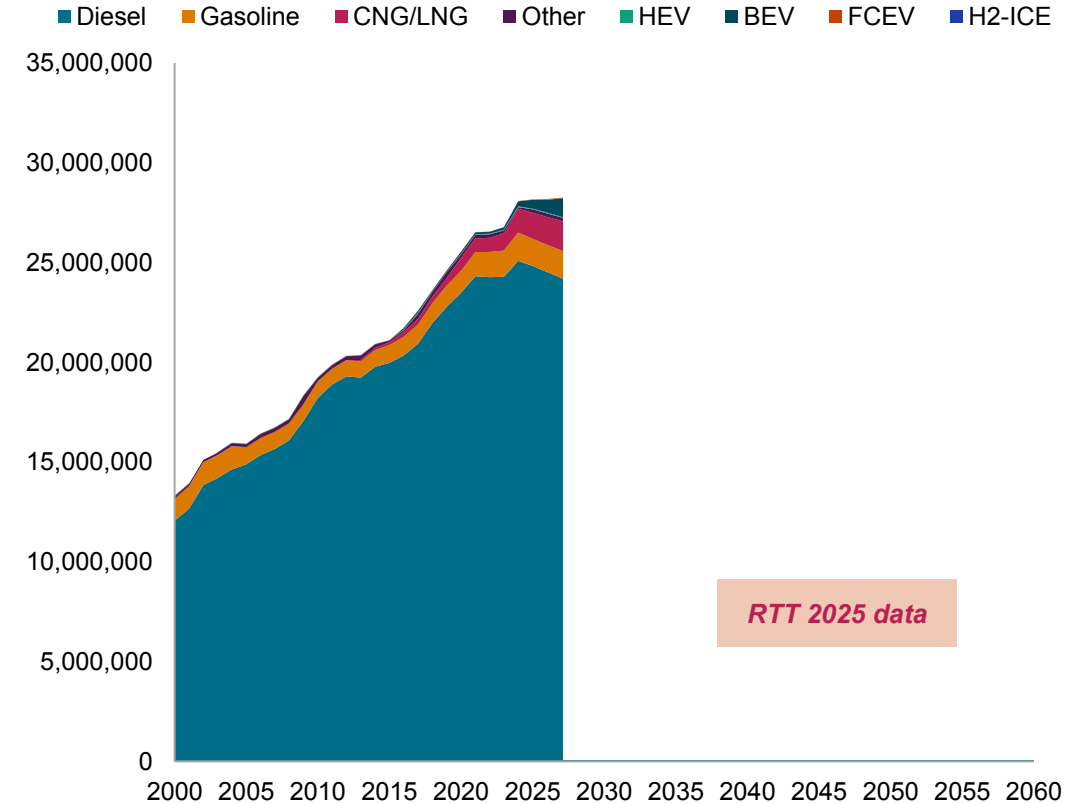
Base Case scenario total truck fleet by fuel type

Mainland China, Europe, Japan, US



Renaissance scenario total truck fleet by fuel type

Mainland China, Europe, Japan, US



Data compiled November 2025.
Sources: S&P Global Mobility; S&P Global Commodity Insights.

Explanation of terms

- **US market:** This study focuses exclusively on vehicles operating within the continental United States.
- **Class 8 vehicles:** Only Class 8 vehicles (33,000 lbs and over) are included in the forecasts shown in this section, as they are considered the primary application for autonomous commercial operations.
- **Retrofits not included:** In this report, we have decided to exclude retrofitted vehicles from our autonomous fleet count. These vehicles, initially produced without Level 4 (L4) automation capabilities, are modified by operators using proprietary sensors and equipment. While retrofitting has facilitated early adoption of autonomous technology, we view it as a short-term bridge solution. Our focus is on the long-term outlook for the autonomous vehicle (AV) market, which will primarily consist of OEM vehicles specifically designed for L4 capabilities. As the industry matures, we expect a shift away from retrofitting toward purpose-built vehicles that offer enhanced performance and reliability. By excluding retrofits, we aim to provide a clearer vision of the future landscape of autonomous mobility, highlighting the importance of OEM innovation in this evolving sector.
- **Scenario-based forecast:** A scenario-based forecasting approach is also used to project the autonomous trucking fleet from 2025 to 2050.
- **Policy continuity:** S&P Global Mobility assumes policy continuity, maintaining forecasts and assumptions without adjusting for potential political outcomes.
- **L4:** Level 4 autonomy level vehicle

Autonomous trucking and S&P Global Mobility autonomy level definitions

S&P Global autonomy levels						
Driver support features				Automated driving features		
Level 0	Level 1	Level 2	Level 2+	Level 3	Level 4	Level 5
Who is driving? Human driver must always supervise the vehicle				When the feature requests, you must drive	These automated driving features will not require driver intervention	
What are the features?				These features allow the vehicle to operate only when specific conditions are met		These features allow the vehicle to operate in all conditions
Examples				Traffic jam chauffeur	- Robotaxis - Autonomous trucking - Pedals/steering wheels are optional	Same as Level 4, but can operate everywhere in all conditions
Provides warnings and momentary assistance	Provides steering or brake and acceleration support to the driver	Provides steering, brake and acceleration support to the driver	Provides steering, brake and acceleration support to the driver and allows for hands-free driving			
Automatic emergency braking, blind spot warning and lane departure warning	Lane centering or adaptive cruise control	Lane centering and adaptive cruise control	Lane centering and adaptive cruise control and driver monitoring system			

Data compiled November 2025.

S&P Global Mobility uses two designations to describe the level of automation of a vehicle relative to its application content. SPGI autonomy levels align closely with the Society of Automotive Engineers' (SAE) levels but additionally include a designation within Level 2 to differentiate Level 2+ functions

Source: S&P Global Mobility.

From vision to reality: Our scenario-based forecast maps the growth of autonomous trucking in the US

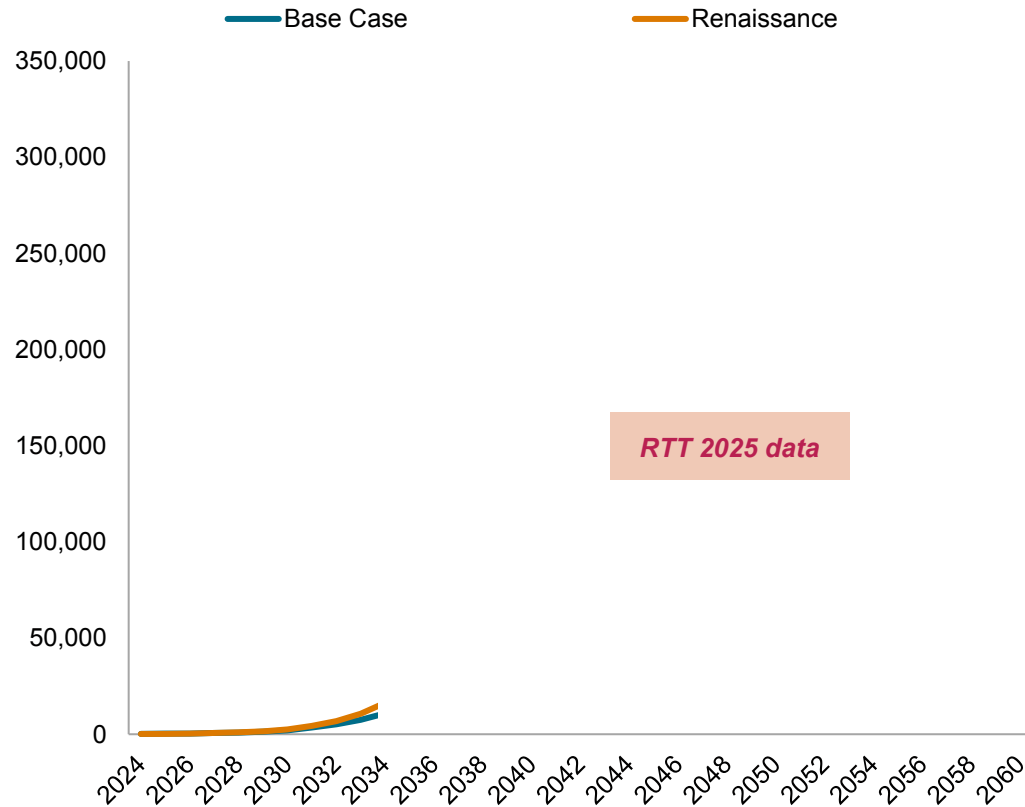
Base Case	Renaissance
<p>Incremental development in autonomous trucking with political and public ambiguity</p>	<p>Milestones in the path to widespread acceptance of safe autonomous trucking</p>
<p>As we transition from 2025 to 2050, the autonomous trucking sector is set for consistent growth, especially in the Sun Belt region of the US. This area, characterized by its favorable climate and flat landscapes, acts as a testing hub for industry leaders such as Aurora Innovation Inc. and Kodiak Robotics Inc. These trailblazers have validated the feasibility of autonomous technology, paving the way for wider acceptance.</p> <p>By 2030, we predict a gradual rise in the deployment of autonomous trucks, fueled by technological advancements and supportive regulations. States will continue to enhance their regulatory frameworks, fostering a more organized environment for AV operations. Public awareness initiatives will be essential in cultivating trust, as the industry aims to reassure the public regarding the safety and dependability of these vehicles. Furthermore, federal standardization will be crucial for widespread adoption, as it will provide a consistent framework for manufacturers and operators, ensuring interoperability and safety across state lines.</p> <p>As autonomous trucks begin to operate alongside human drivers, the emphasis will shift to promoting a collaborative relationship. Companies will invest in technologies that improve communication between AVs and vehicles operated by humans to ensure safe interactions. By 2040, we expect to see operational efficiencies emerge, with notable cost savings and enhanced delivery times attracting shippers to autonomous solutions.</p> <p>Nonetheless, the path forward will not be without obstacles. The industry must uphold public confidence, especially following any incidents involving AVs. As the market evolves, we anticipate a gradual yet steady integration of autonomous trucks into logistics operations, ultimately leading to a more streamlined and cost-efficient transportation ecosystem by 2050.</p>	<p>The Renaissance scenario envisions a more rapid ascent for the autonomous trucking industry from 2025 to 2050. With public sentiment increasingly favoring eco-friendly, cost-effective and efficient solutions. We expect a surge in the adoption of autonomous trucks, particularly in the Sun Belt region, where conditions are ideal. Autonomous trucking companies must focus on shaping public perception through transparency and proactive engagement.</p> <p>By 2030, the pace of adoption will accelerate as regulatory frameworks become more supportive, enabling faster deployment of AVs. Public trust will grow more quickly, fueled by successful pilot programs and demonstrable safety records. Education campaigns will highlight the economic and environmental benefits of autonomous trucking, appealing to shippers looking for cost-effective and sustainable solutions.</p> <p>By 2040, the integration of autonomous trucks into logistics operations will be more widespread. The technology will be viewed as a standard rather than an exception, with shippers gravitating toward AVs for their ability to reduce operational costs and improve delivery efficiency. The industry will respond to growing environmental concerns by emphasizing the greener aspects of autonomous technology, positioning it as part of a broader sustainability agenda.</p> <p>As we approach 2050, the landscape of transportation will be transformed, with autonomous trucking playing a central role. The collaboration between stakeholders — OEMs, shippers and drivers — will be vital in navigating this transition. The Renaissance scenario will depict a future where autonomous trucks are not only commonplace but also integral to a more efficient, safe and environmentally responsible transportation ecosystem.</p>

Data compiled November 2025.
Source: S&P Global Mobility.

In the Base Case scenario, the autonomous trucking fleet is projected to reach nearly [REDACTED] units, or [REDACTED]% of the fleet, primarily dominated by Class 8 trucks

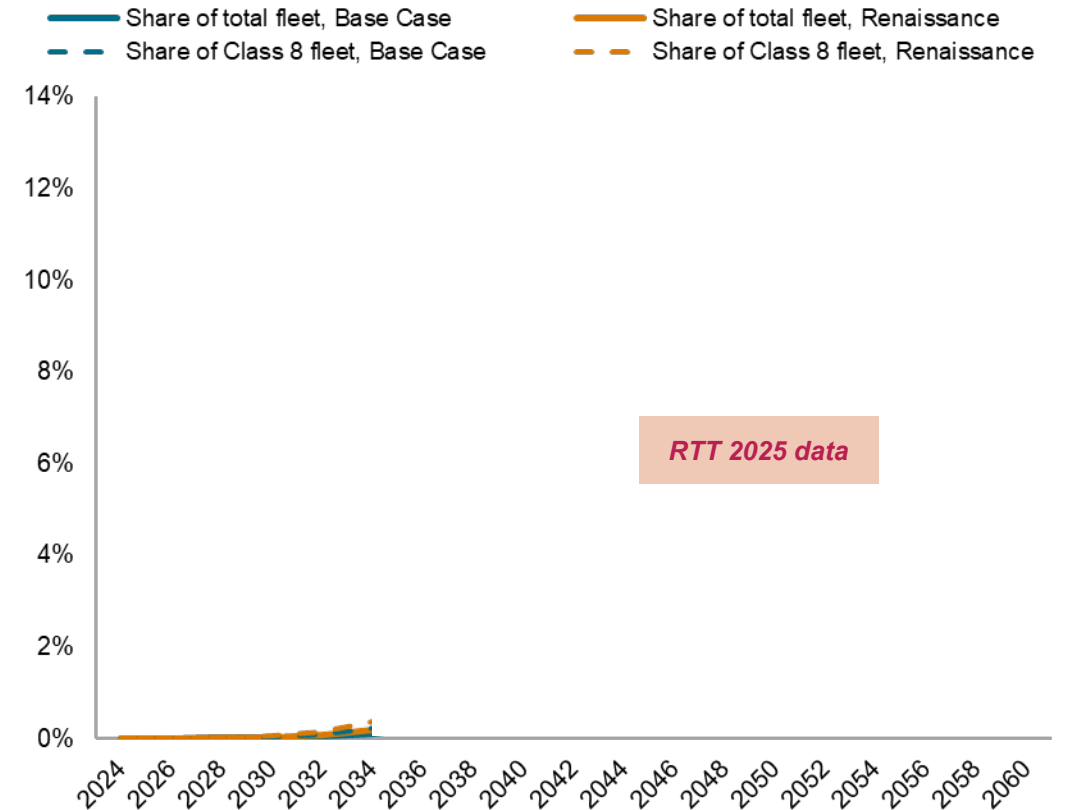
Level 4 autonomous trucking fleet size, United States

Forecast by scenario



Fleet share of autonomous Class 8 trucks under different scenarios

Forecast by scenario



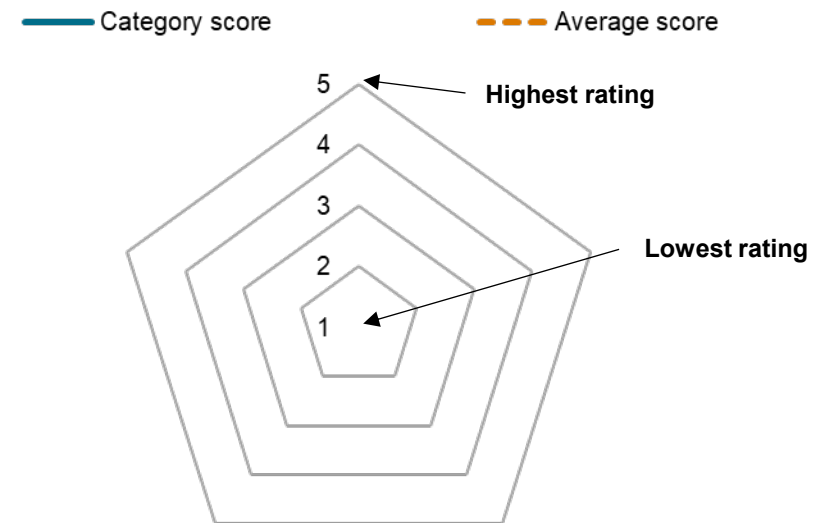
Data compiled November 2025.
Sources: S&P Global Mobility; S&P Global Commodity Insights.

New players: Evaluation of the current landscape

The following slides provide an overview of a handful of new players in the MHCV market

- New companies are rapidly attempting to enter the MHCV market. As future demand to move goods in a sustainable way is only expected to grow, most new OEMs are looking to launch ZEVs. However, even with encouraging future demand, new OEMs will face strong competition from legacy OEMs with established manufacturing capabilities and strong balance sheets.
- New OEMs can be classified as companies that were formed within the past several years and intend to manufacture their own MHCVs. Additionally, a new OEM can be a legacy OEM that has entered the MHCV industry. To evaluate each of the highlighted OEMs in this report, a radar evaluation chart has been developed that looks at five major factors:
 - **Financials**
 - Rating of 1 if investments < \$10 million, if publicly traded metric = cash on hand
 - Rating of 5 if investments > \$500 million, if publicly traded metric = cash on hand
 - **Product maturity**
 - Rating of 1 if the vehicle is only a concept
 - Rating of 5 if the vehicle is in series production
 - **Dealership network**
 - Rating of 1 if no dealership network exists and there are no plans
 - Rating of 5 if the OEM is using an existing dealership network or has established partnerships
 - **Manufacturing capability**
 - Rating of 1 if there is no factory and no factory plans
 - Rating of 5 if a factory exists with operational production lines
 - **Expected near-term growth**
 - Average of all categories listed above

Company evaluation



New players: MHCVs

Motiv Electric Trucks

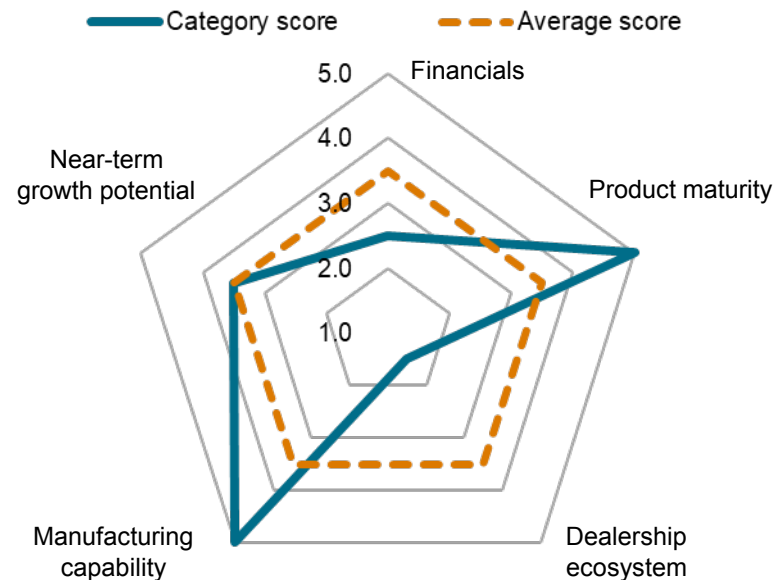
Overview

Foundation year:	2009
Headquarters:	San Francisco, California
Ownership:	Private
Segment:	Medium duty
Partnerships:	Morgan Olson, Utilimaster
Included in the model/engine level forecast:	No

Company overview

Motiv Electric Trucks, formerly known as Motiv Power Systems, is a California-based company focused on manufacturing zero-emission, medium-duty EVs. Since its founding in 2009, the company has been committed to providing sustainable transportation solutions for a variety of applications, including delivery vans, school buses and work vehicles. Motiv's vehicles have collectively surpassed five million all-electric miles, underscoring their reliability and performance in diverse fleet operations. Looking ahead, the company is actively working to develop its own proprietary chassis to enhance vehicle integration and performance over the next few years. Motiv is also undergoing a merger with Workhorse Group, which is expected to expand its manufacturing capabilities and strengthen its market position.

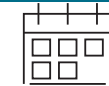
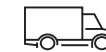
Company evaluation



S&P Global Mobility confidence level



Planned product portfolio



2015

Medium-duty chassis **BEV propulsion** **Start of production**

Upcoming models' highlights

Motiv Platform S — Medium-duty electric truck with a range of up to 150 miles, a GVWR of up to 22,000 pounds and a 158-kWh LFP battery. Charging times are 10.25 hours using alternating-current (AC) charging and two hours using direct-current (DC) charging.

Motiv Platform SL — Medium-duty electric truck with a range of up to 200 miles, a GVWR of up to 22,000 pounds and a 237-kWh LFP battery. Charging times are 15.25 hours using AC charging and three hours using DC charging.

Launch market



Asia



Mainland China



Europe



North America

Data compiled November 2025.

Motiv Electric Trucks = Motiv Power Systems Inc.; Morgan Olson = Morgan Olson LLC.; Utilimaster = Utilimaster, a brand of the Shyft Group Inc.; Workhorse = Workhorse Group Inc.

Source: S&P Global Mobility.

New players: Evaluation of the current landscape

The following slides provide an overview of a handful of new players in the MHCV AV developer market

- New companies are rapidly entering the AV developer market, driven by the emergence of autonomous driving technologies that offer potentially lower operational costs compared with traditional human-driven trucks. This shift is creating interest in autonomous freight transportation. However, despite the promising outlook, new AV developers will face fierce competition from other players and must possess robust operational capabilities and solid financial backing to succeed.
- New AV developers can be classified as companies formed within the past several years that intend to provide their own AV freight services. Additionally, a new AV developer can be a legacy developer that has ventured into the AV space. To evaluate each of the highlighted AV developers in this report, a radar evaluation chart has been developed, focusing on five major factors:

– Financials

- Subjective rating system based on cash on hand, recent investments and industry knowledge. Ratings will reflect a comprehensive assessment of a company's financial health and market position, integrating qualitative insights alongside quantitative metrics

– Product maturity

- Rating of 1 if the vehicle/product is only a concept
- Rating of 5 if the vehicle/product is in series production

– Partnership network

- Rating of 1 if no partnerships exist and there are no plans
- Rating of 5 if the developer has established partnerships

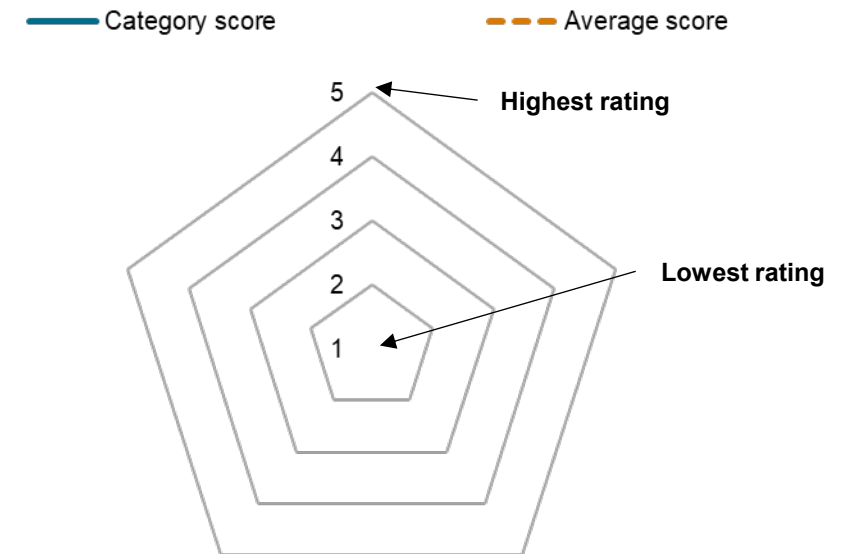
– Manufacturing capability

- Rating of 1 if there are no supply chains established
- Rating of 5 if multiple supply chains exist

• Expected near-term growth

- Average of all categories listed above

Company evaluation



Data compiled November 2025.

Source: S&P Global Mobility.

New players: Autonomous developers

Aurora Innovation

Overview

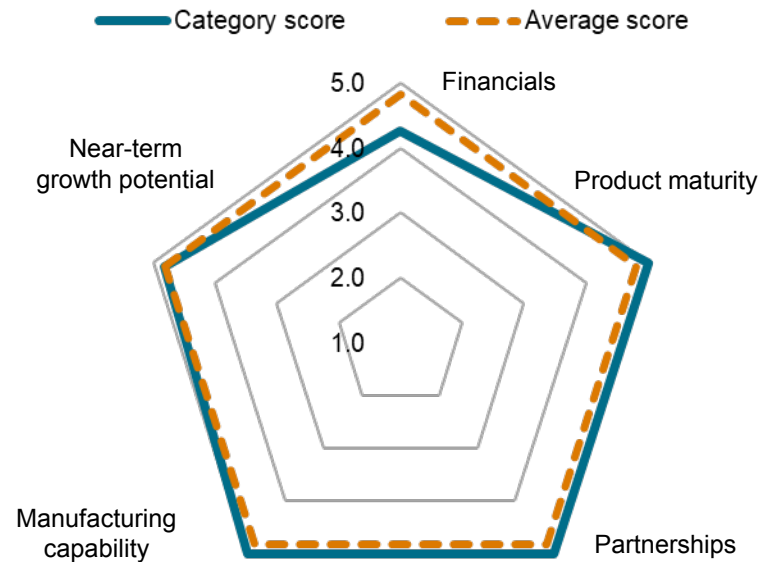
Foundation year:	2017
Headquarters:	Pittsburgh, Pennsylvania
Ownership:	Publicly traded
Industry partnerships:	Continental, PACCAR, Volvo Trucks
Fleet partnerships:	Uber Freight, FedEx, Schneider, Mcleod

Company overview

Aurora Innovation is among the market leaders in autonomous trucking technology, focusing on heavy-duty Class 8 trucks through its Aurora Driver platform. It was founded by veterans from Google, Tesla and Uber.

In May 2025, Aurora launched the first fully autonomous, revenue-generating trucking service in the US, operating along the Dallas-Houston corridor. The company has since expanded operations to include nighttime routes and opened a Phoenix terminal to support longer-haul routes like Fort Worth-Phoenix. Aurora has a strong focus on creating scalable, enterprise-ready solutions. With its first revenues reported in 2025, Aurora is transitioning from R&D to a commercially viable player in the autonomous trucking industry. Recently, Aurora obtained a waiver permitting the use of cab-mounted flashing warning beacons in place of reflective triangles. This change enables them to operate more freely and without the need for a support vehicle.

Company evaluation



S&P Global Mobility confidence level



Deployment plans

Aurora Innovation began fully driverless commercial operations in May 2025, starting with the Dallas-Houston route. By July 2025, Aurora expanded to nighttime operations, significantly increasing truck utilization rates. The company also opened a Phoenix terminal to support a new Fort Worth-Phoenix route, signaling its first major expansion beyond Texas.

Aurora's phased "Crawl, Walk, Run" strategy ensures a systematic approach to scaling operations. The company has logged over 20,000 driverless miles and is actively piloting new routes to expand its service footprint. Aurora plans to grow its fleet to tens of trucks by late 2025 while enhancing the Aurora Driver's ability to navigate challenging weather conditions. Strategic partnerships, such as its collaboration with McLeod Software to integrate autonomous trucks into logistics systems, further strengthen its position in the autonomous freight sector.

Launch market



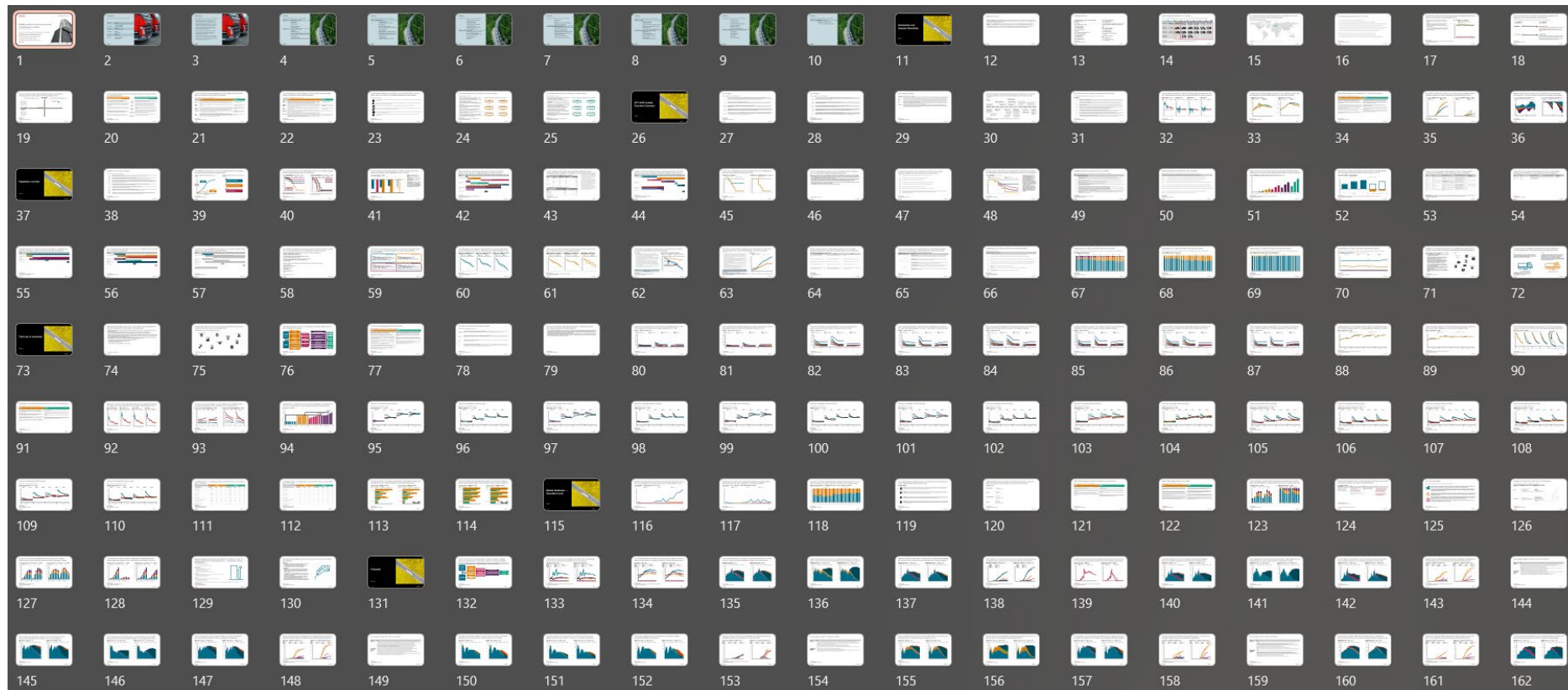
Data compiled November 2025.

Aurora Innovation = Aurora Innovation Inc.; Continental = Continental AG; PACCAR = PACCAR Inc.; Volvo Trucks = Volvo Trucks North America Inc.; Uber Freight = Uber Freight Holding Corp.; Schneider = Schneider National Inc.; Google = Google LLC; Uber = Uber Technologies Inc.; Tesla = Tesla Inc.; Mcleod = McLeod Software Corp.

Source: S&P Global Mobility.

Deliverables: PowerPoint report

This year's report is about 230 slides long!



Data compiled November 2024.

Sources: S&P Global Mobility; S&P Global Commodity Insights.

Report: **Reinventing the Truck**

S&P Global Mobility MHCV long-term outlook

November 2025

Available now!

CONTACT US FOR MORE INFORMATION

Note: MHCV = medium and heavy commercial vehicles
Source: S&P Global Mobility; S&P Global Commodity Insights



Contact us

Primary contact(s)

Andrej Divis

andrej.divis@spglobal.com

Greg Genette

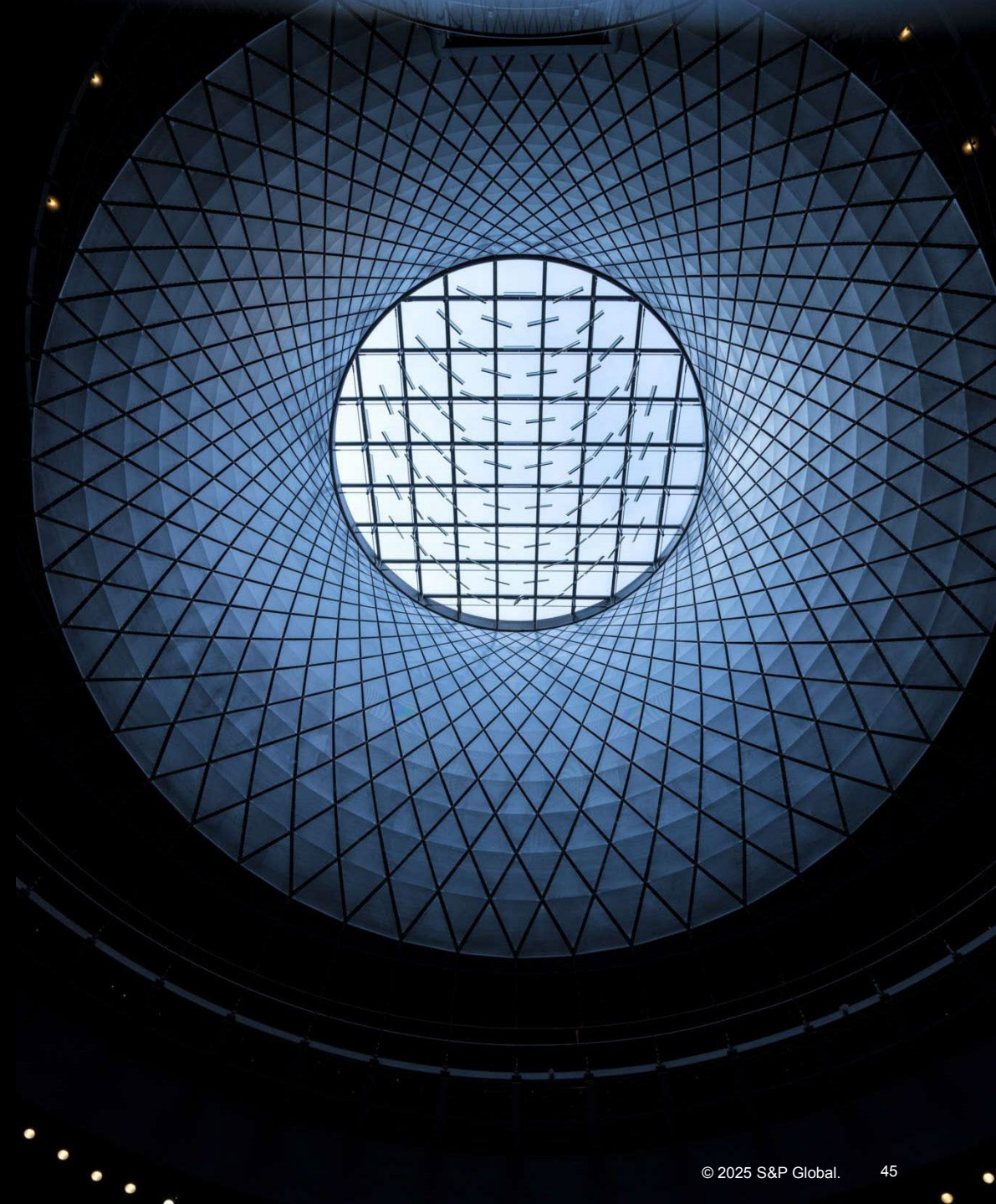
gregory.Genette@spglobal.com

Contact us

Americas	+1 800 447 2273
Japan	+81 3 6262 1887
Asia-Pacific	+60 4 291 3600
Europe, Middle East, Africa	+44 (0) 134 432 8300

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