



IHS Markit™

# Reinventing the Truck

Analyzing the impact of electrification, alternative fuels and autonomy advances on fleets, OEMs and suppliers.



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## Reinventing the Truck

Large shifts loom in the medium- and heavy-duty industry. From electrification to autonomous capabilities, there seems to be a new catchword every day that points to uncertainty in the industry. In *Reinventing the Truck (RTT)* we tackle these uncertainties, aid in future-focused decision making and confront the “what-if” questions facing so many industry players.

*RTT* will encompass market climates through two scenarios. Rivalry: a “status-quo” outlook, and Autonomy: a more aggressive push towards electrification and autonomous systems.

### Initial takeaways – Rivalry scenario

- Diesel truck demand will remain strong, although it will lose share to CNG, LNG and BEV.
- Sales of battery electric trucks will be limited in the Class 8 sector due to cost, range and weight disadvantages when compared to diesel.
- Battery costs will become more competitive around 2030, causing an uptick in sales of medium-sized battery electric trucks.
- Level 4 and 5 autonomous truck sales will commence in the United States, followed shortly thereafter in Europe and Japan.

Not facing the same driver shortage issue as other *RTT* regions, China will be slow to adopt autonomous trucking.

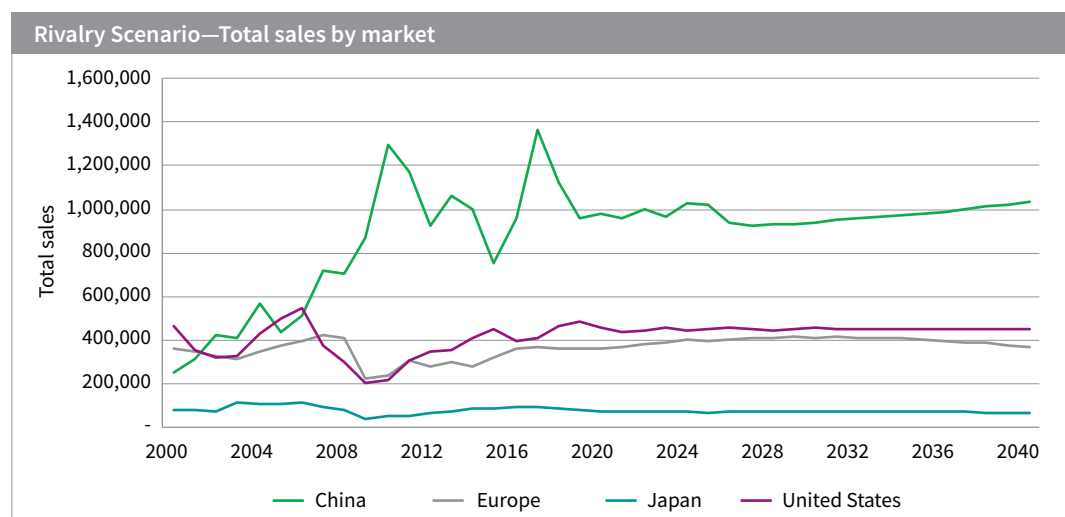
Findings of the Autonomy scenario will be completed in the coming weeks.

*RTT* and the IHS Markit advisors can provide a basis for investment decisions and strategic planning, uncovering the expected timing and nature of emerging technologies in the commercial vehicle market. With a deep expertise in cost drivers, regulatory and macroeconomic factors underpinning the industry transition, IHS Markit is uniquely positioned to help navigate market uncertainties.

The following outline lists a few findings from *RTT*’s Rivalry scenario:

### Executive summary

The Chinese market will experience the highest growth of *RTT* regions. Market volatility will contract as China’s logistical systems become more efficient and mature. Sales will flatten in the United States, Japan and the European Union owing to maturing economies. Powertrain shifts to alternative fuels will disrupt the diesel engine share of sales, but do not stand to overtake the majority share by 2040. The shift towards electric powertrains will happen in medium trucks far before finding footing in Class 8 applications.





Compressed natural gas and liquefied natural gas (CNG/LNG) fuel sales will have strong footing in the United States and China in Class 8 and present a viable alternative fuel in this sector. Other alternative fuels, such as fuel cells and hybrid electric vehicles (HEVs), will disrupt diesel as well. Autonomous vehicles (Society of Automotive Engineers [SAE] level 4 and level 5) will arrive on-road in the United States first, and shortly thereafter in the European Union and Japan. With driver shortage less of an issue, China will adopt autonomous driving technologies later than other regions. Autonomous vehicles will penetrate the vehicle parc with 300,000 vehicles in the fleet by 2040.

## Regional differences

Vast differences exist within each *RTT* region, leading to shifting strategies for OEMs and suppliers.

### United States – High Gas Penetration Market, CNG/LNG infrastructure in place:

- The gasoline and CNG/LNG index is higher in the United States versus other markets. The buyers' preference toward gasoline is driven by smaller Class 4 and 5 offerings.
- Infrastructure readiness of CNG/LNG drives more share from diesel in the United States. This is also the case with BEV; however, the market is not ready for long-haul commercial vehicles to transition to BEV.

### China – High-growth market, most “emerging” market for new truck sales:

- Sales are higher in the heavy, Class 8 segment as it is largely a manufacturing economy. However, medium truck sales will gain share as urbanization increases.
- CNG/LNG take share from diesel in the long-haul, Class 8 segment, however, diesel retains the majority through 2040.

### European Union – Diesel-heavy market in PC and MHCV:

- Diesel remains the dominant fuel type in Europe for both passenger cars (PC) and medium heavy commercial vehicles (MHCV). CNG/LNG powertrains are less likely to overtake (but will disrupt) diesel. BEV and HEV options are more likely in this region as clean-air policy drives alternatives.
- Heavy truck sales dominate the region over medium as they have historically, but ton-km shifts toward urban to cause growth of medium trucks.

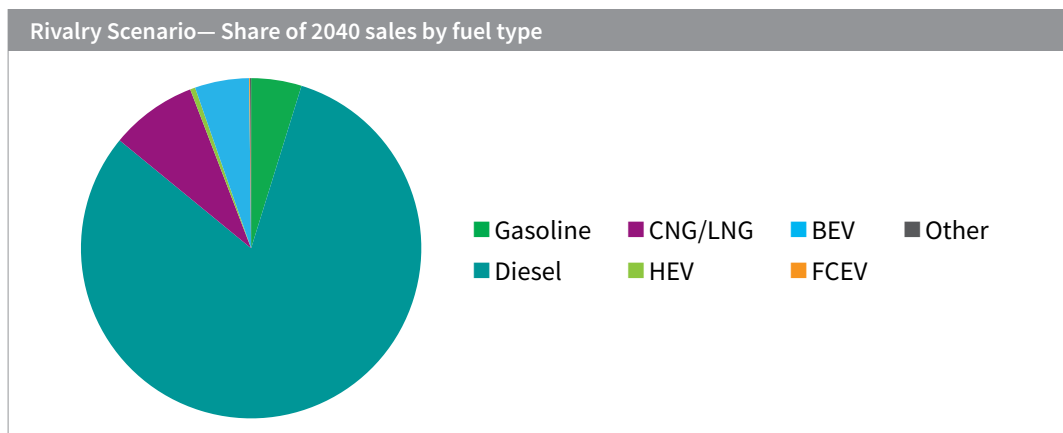
### Japan – Flat/declining market as economy and population slow:

- Sales are split evenly between medium and heavy truck sales as the country has a large urban concentration, lending itself to the transport of goods via medium truck.
- As medium truck accounts for a large portion of sales, battery electric vehicles (BEVs) will have a larger share of the overall market in Japan.

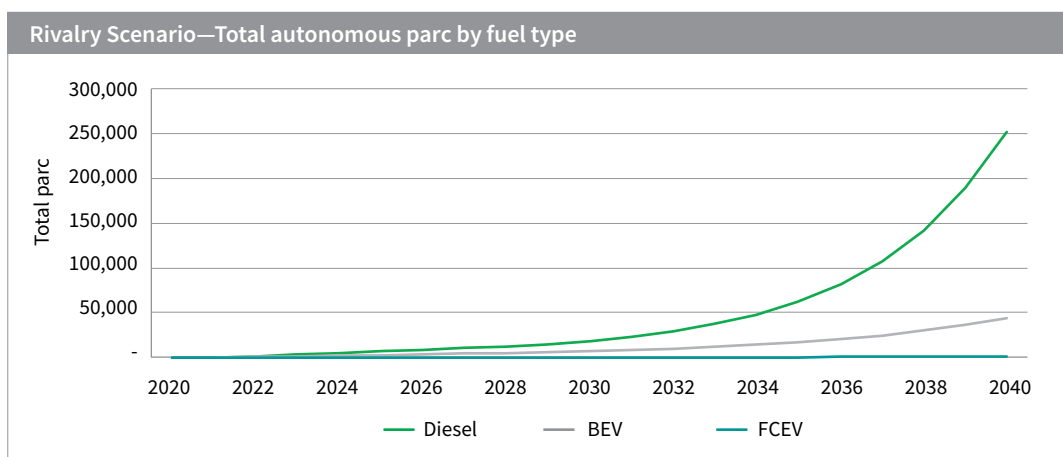
## Technology trends

Limitations of electric powertrains (charge time, weight constraints and the cost of batteries) confine BEV sales to medium-duty applications with short, defined routes. Battery costs will become more competitive around 2030, leading to faster adoption. CNG/LNG is the top competitor to diesel for share of new sales due to readiness in China and the United States. Fuel cell captures a limited share of long-haul sales, but remains a decent alternative to diesel, with its competitive range and charge time. Advancements in the diesel engine allow it to remain cost competitive to new technologies to 2040, but share will decrease over time.

Advancements in the diesel engine allow it to remain cost competitive to new technologies to 2040



Autonomous systems will be sold in the United States first, with small point-to-point adoption initially. As level 4 and 5 technology is proven, diesel takes share, with long-haul use (including platooning) becoming possible. BEV and fuel cell will begin using this technology en masse as range and costs become competitive. Automated systems, such as automated manual transmission and automatic transmissions, are a precursor to level 4 and 5 autonomous driving vehicles seeing mass adoption in traditional internal combustion engine applications. China will begin autonomous adoption by 2030 as driver shortage is much less of an issue than in other RTT regions.



## Final thoughts

A further analysis of this engagement is planned with IHS Markit’s Autonomy scenario, to further cover the “what-if’s” the future may hold:

- What if the government mandated zero emissions vehicle zones are implemented?
- What if battery technology becomes more cost competitive at a faster rate than expected?
- What if diesel engines are banned in certain areas?
- How will driver shortages change the market landscape?

We will explore these questions, along with many additional areas, in our Autonomy scenario.



## Within the two scenarios Reinventing the Truck clients will receive:

- A sales forecast to 2040, by powertrain, for medium and heavy trucks in China, the European Union, Japan and the United States
- A vehicle parc forecast to 2040, by powertrain, for medium and heavy trucks in China, the European Union, Japan and the United States
- Autonomous truck sales and parc in China, the European Union, Japan and the United States
- A PowerPoint presentation describing technology changes and market shifts for additional context around the forecast
- Access to a client workshop with other industry leaders in Chicago on 11–12 July

For more information please visit [www.ihsmarket.com/rtt](http://www.ihsmarket.com/rtt)

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