Zeroing in on Zero-Emission Trucks

June 2026 Market Update

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Overview

By the end of 2025, cumulative zero-emission truck (ZET) deployments in the United States reached 72,309 vehicles, with 12,996 deployments added from July through December, a 99% increase from the 6,526 deployments added in the first half of 2025. This update captures vehicle deployments, including purchased and leased vehicles, for cargo vans, medium-duty (MD) step vans, MD trucks, heavy-duty (HD) trucks, refuse trucks, and yard tractors as of December 2025. After a slower first half of the year, the U.S. ZET market gained momentum in the second half, with ZETs representing 4.14% of all truck deployments from July through December 2025, up from 1.32% in the first half of the year.

Cargo vans remained the largest segment and drove much of the market's growth in the second half of 2025, rebounding from a weaker first half of the year. After 5,374 cargo van deployments in January through June 2025, the segment added 12,158 more in July through December. At the same time, non-cargo-van deployments contributed 838 additional deployments, showing that market growth was not limited to a single segment.

California (12,874), Florida (6,179), and Texas (5,953) are the top 3 states for cumulative ZET deployments, with Florida and Texas swapping places. When adjusting for truck stock and segment, the leading states for **normalized ZET scores** are California (3.11), New York (.97), and Pennsylvania (.97). These states are performing above the national average and stand out as leaders in ZET adoption relative to market size. Their performance suggests that supportive policy, more favorable economics, and greater awareness and education around ZETs continue to shape where adoption is advancing the quickest.

1 Total U.S. ZET Deployments

As of December 2025, 72,309 ZETs had been deployed in the United States, across 6 vehicle segments (Figure 1).[1] This marks an increase from 52,787 at the end of 2024, meaning the market added 19,522 cumulative deployments over the course of 2025. The second half of the year was especially strong, with 12,996 deployments added between July and December, almost double the 6,526 added in the first half of the year — a 31% year-over-year increase from the same time frame in 2024. The previous year started to see a slowdown in ZET deployments, but the back half of 2025 provided a strong indication that ZETs are still in demand from fleets across the country. Only 1 new hydrogen fuel cell truck was deployed during this time frame, bringing the total to 198, all in the HD truck segment. Challenges with infrastructure, cost, and model availability prevent hydrogen fuel cell trucks from being adopted more broadly.

In 2025, 120 ZETs were taken out of service and are no longer deployed. But these vehicles may not necessarily be permanently retired; some may have reached the end of a lease, been returned to dealers, entered auction channels, or become available for resale. While still a small number, this movement may signal the early development of a secondary ZET market as vehicles begin cycling beyond their first deployment.

ZET deployments saw their best 6-month performance period to date in the second half of 2025, with a deployment share of 4.14% (Figure 2). The previous high was 3.13%, which was set in the first 6 months of 2023. Total truck sales declined in the back half of the year, with only 314,067 reported sales (-35% year-over-year). Multiple manufacturers, such as **PACCAR** and **Daimler**, cited declines in year-over-year sales.

While total truck sales may have dipped, total zero-emission sales did not. This is in part due to a strong

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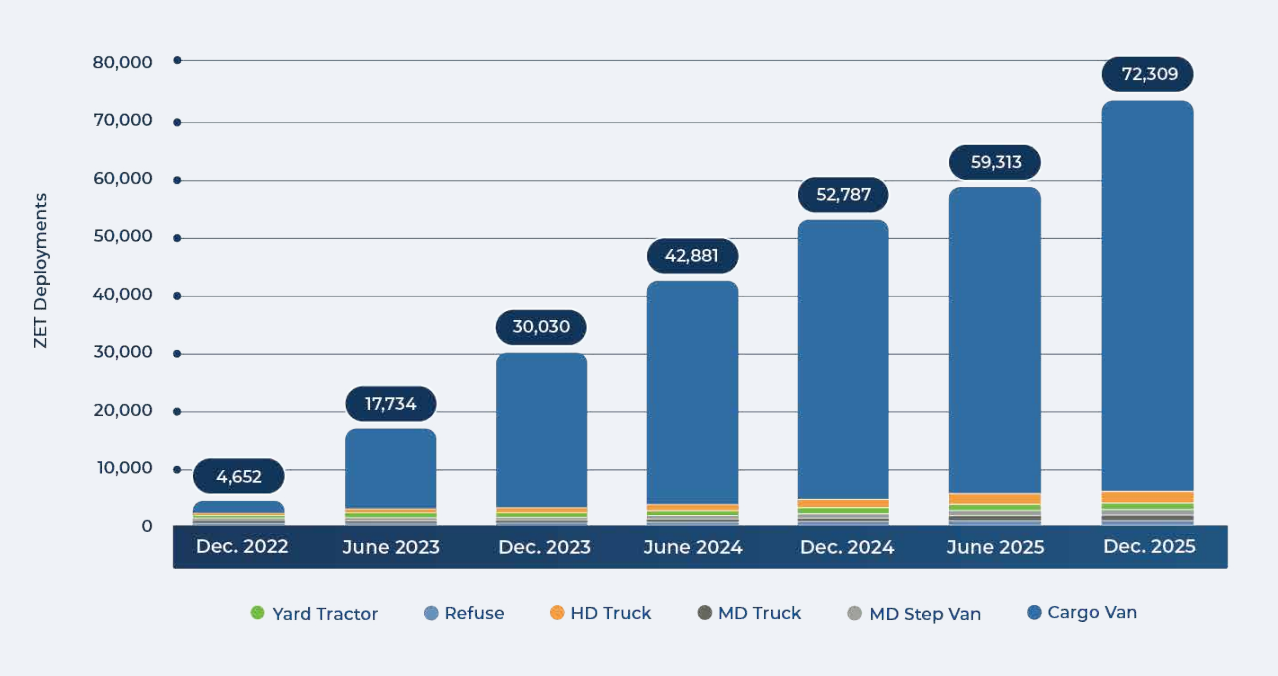
[1] See the appendix for definitions, data sources, and assumptions made in this market update.

Figure 1: Cumulative U.S. ZET Deployments



rebound from cargo vans, which saw 12,158 new deployments between July and December 2025, their most deployments in a 6-month period to date. The number of cargo van deployments at the start of the year, only 5,374 in the first 6 months, was more than doubled in the back half. This strong rebound could be from fleets taking advantage of expiring tax credits, greater certainty in business operations after a year of standstill, and greater consumer confidence in zero-emission cargo van technology. Zero-emission cargo vans continue to offer compelling advantages to fleets like ideal duty-cycle capability, lower upfront costs, and more streamlined infrastructure for fleets to navigate.

Cargo vans were not alone in making big gains in zero-emission deployment share, with both refuse trucks and MD step vans seeing noticeable increases **from our last report (3.02% and 4.94%, respectively**). Refuse trucks have recently gained momentum, with early deployments showing a great deal of success, exemplified by initial pilots like **Republic Services** and **Royal Waste**. These pilots led to additional deployments; the fleets pointed to operational benefits such as reduced driver fatigue, lower vehicle downtime, and strong performance in start-and-stop duty cycles, in which regenerative braking can help support vehicle range. As fleets continue to pilot zero-emission refuse trucks and gain confidence in their operation, we expect the sector to continue rising in the coming years.

Yard tractors continue to be the leader in zero-emission market share by segment. In the second half of

2025, 219 total zero-emission yard tractors were deployed, representing 8.05% of all yard tractor deployments during that period. This brings the total percentage of zero-emission yard tractors in operation to 3.21%, the most of any segment. The segment has seen an increase in annual deployments every year, and zero-emission yard tractors' proven operational performance, quick return on investment, and more-manageable infrastructure will help this segment continue trending upward.

Global market trends also highlight how quickly ZET adoption can be scaled under policy and market alignment. In China, new energy HD trucks, including electric, plug-in hybrid, and hydrogen-powered vehicles, accounted for **54% of total HD truck sales in December 2025**, with more than 45,000 units sold that month. Over the full year, more than 231,000 new energy HD trucks were registered in China, representing a 182% increase from 2024. While these figures reflect a broader category than

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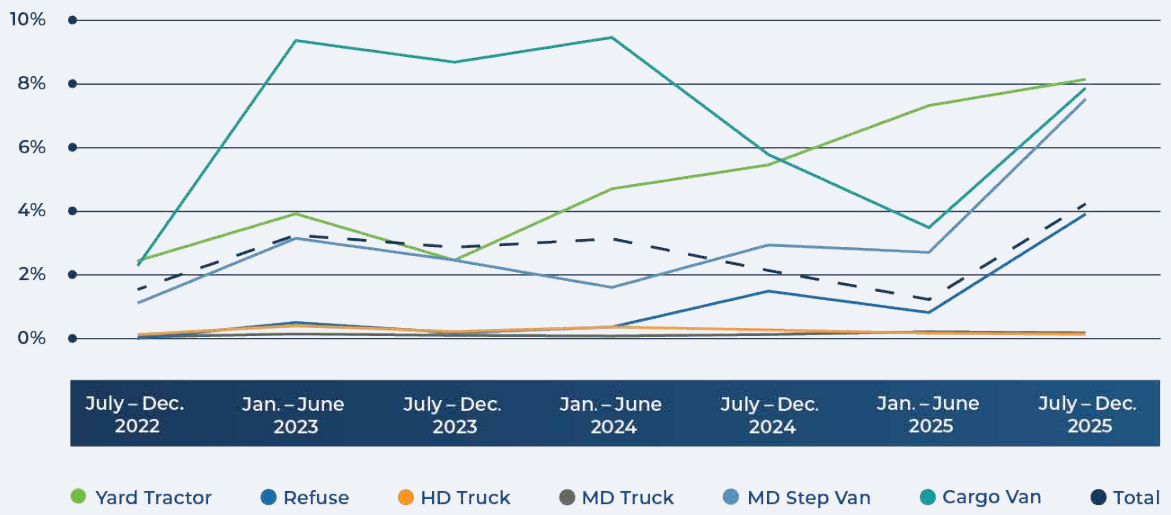
Figure 2: ZET Deployment Share Over Time



ZETs alone, they still underscore the scale and speed at which the HD market can begin to shift when manufacturing capacity, policy support, and market demand are aligned. As the U.S. market continues to develop, this global comparison highlights both the size of the opportunity and importance of maintaining momentum through supportive policy, infrastructure investment, and continued market development.

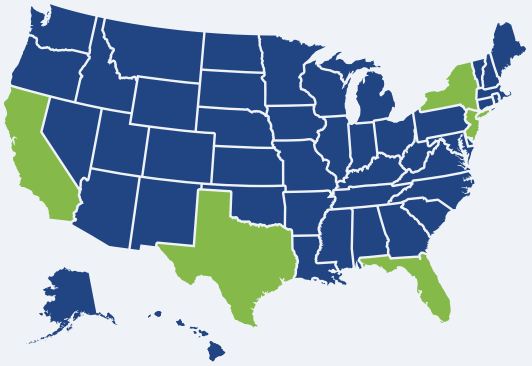
Despite the slowdown in overall truck deployments, zero-emission deployments did not slow down in the back half of 2025. With a deployment share of 2.44% for all of 2025, the annual ZET deployment share did not deviate from the 2 previous years. 2026 will be a decisive year for understanding how ZET adoption will trend in the near future. An uptick was expected with the federal tax credits expiring on September 30, 2025, though ZET demand may continue to increase; in fact, **Harbinger stated** their sales surged after the tax credit expired.

States can further accelerate ZET adoption by implementing solutions outlined in the **ZET Ahead Dashboard**, whether that solution is a Low Carbon Fuel Standard, a zero-emission delivery zone, a workforce training program, or any other policy that helps make it more practical for fleets to deploy ZETs. Future deployment trends will rely on a clearer business case for ZETs and how effectively states use policy, infrastructure planning, and fleet engagement to accelerate ZET adoption.

2 U.S. ZET Deployments by State

2.1 Total Deployments

State-level deployment patterns continue to reflect where policy support, freight activity, and market readiness overlap. California (12,874), Florida (6,179), and Texas (5,953) are the top 3 states for cumulative ZET deployments through the end of 2025. This trend remains the same from previous editions, as the majority of ZET deployments are



Top Five States for Total ZET Deployments:

1. **California: 12,874**
2. **Florida: 6,179**
3. **Texas: 5,953**
4. **New York: 3,923**
5. **New Jersey: 3,079**

concentrated in states with large truck stock populations. Beyond these leading states, the market is continuing to spread more broadly across the country. Twenty-two states now have more than 1,000 ZET deployments, up from 18 in the last market update. Colorado, Indiana, Oregon, and Tennessee each crossed 1,000 deployments, while Illinois, Michigan, and Washington each surpassed 2,000 cumulative deployments. Together, these results indicate that, although the largest share of deployment remains concentrated in a small number of leading states, ZET adoption is becoming more widely distributed across the country.

The top 3 states also saw the largest 6-month increases in ZET deployments. However, California, Florida, and Texas were not the leaders in all 2025 ZET deployments; North Carolina (1,103) outpaced Texas (944) for third on the annual leaderboard. Louisiana; Alabama; Mississippi; Washington, D.C.; Iowa; and Idaho were the only states to more than double their total ZET deployments in the past year.

2.2 Normalized ZET Deployments

While total deployment counts show where the largest number of ZETs are located, these numbers do not fully account for differences in state truck stock or fleet composition. To better understand where adoption is advancing relative to market size, we also looked at normalized ZET scores. A positive number means the state is performing better than the national average, while a negative number means a state is performing below the national average, where 0 is the national average.[2]

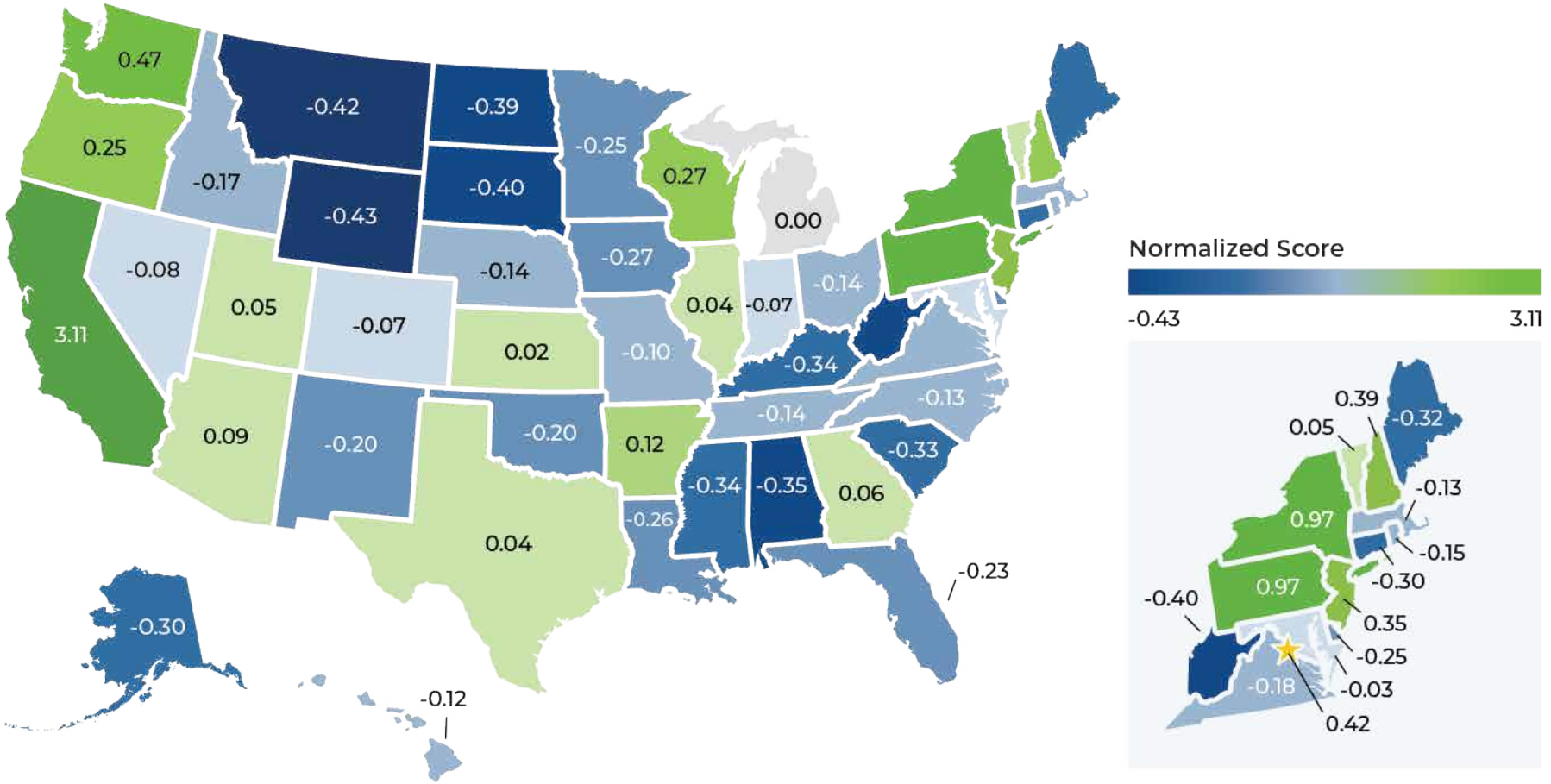
When normalizing ZET deployments for vehicle stock and segment, the leaders are California (3.11), New York (.97), and Pennsylvania (.97). These are the states where ZET adoption is most above the national average, indicating which states are most effectively accelerating ZET adoption. Normalizing ZET deployments by segment offers a fairer way to assess a state's true progress and, in doing so, better understand how states are performing in the ZET transition.

One change in our methodology from the last report was to account for states with a higher concentration of large fleets, because we noticed that states with a higher concentration of larger fleets all scored higher in their normalized ZET score. Previous research confirmed that **large fleets will drive early ZET deployments**; however, this can create an uneven playing field when assessing states that are doing the most to accelerate ZET deployments. A state with a small concentration of large fleets cannot be carried by a single fleet and therefore would go unnoticed in our previous method to evaluate their market acceleration efforts. Figure 3 shows the normalized score of each state.

Normalized ZET score leaders have changed from our last report, with New York and Pennsylvania both

[2] The appendix contains a full explanation of how we calculate normalized ZET scores and how to interpret the results.

Figure 3: Normalized ZET Deployments

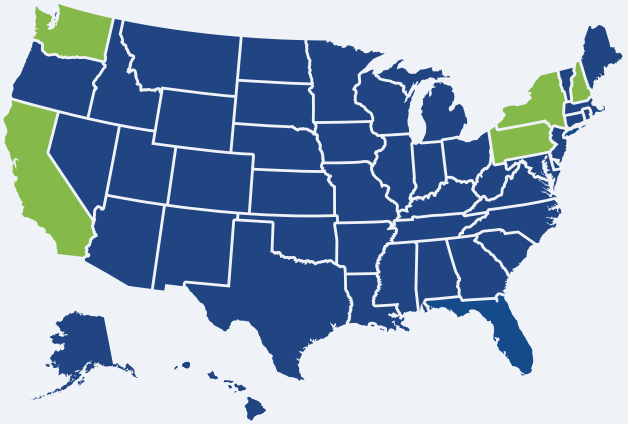


Note: For the normalized ZET score, 0 represents the national average, positive scores indicate above-average performance, and negative scores indicate below-average performance.

jumping into the top three. Both states had positive ZET scores in the last report and above-average ZET deployment numbers in the back half of 2025. But, crucially, New York and Pennsylvania have both started to deploy a greater diversity of vehicle segments. Our methodology change did help boost these states' normalized scores as well, as both were in the bottom half of large fleet concentration. Washington remains in the top five, but Wisconsin, New Jersey, and Georgia all dropped out; because of their still-positive ZET score, all three states did not drop far out of the top five. Wisconsin, New Jersey, and Georgia all continue to deploy ZETs at an impressive rate but do have a higher concentration of large fleets, which lowered their scores in our updated model.

Top Five States for Normalized ZET Deployments:

1. California (3.11)
2. New York (.97)
3. Pennsylvania (.97)
4. Washington (.47)
5. New Hampshire (.39)



New York and Pennsylvania are comparable states. Both are in the top 10 for truck stock, have a very similar fleet composition, and are in the Northeast with similar economic aspects such as electricity and fuel pricing. New York has also established a long-standing incentive program, the New York Truck Voucher Incentive Program (**NYTVIP**), and Pennsylvania has offered many different incentive opportunities as well, **PA-FIT** being the most recent.[3] Both states have taken extra steps to ensure the ZET ecosystem is in place with workforce development, infrastructure make-ready programs, and statewide clean transportation planning. These factors have undoubtedly helped both states punch above their weight and lead in accelerating ZET deployments for fleets.

California's continued leadership reflects a more mature policy ecosystem with a wide range of complementary policy approaches

[3] See the Funding Finder at https://fundingfindertool.org/ for a list of incentive programs in the United States.

to support ZET adoption. The state has combined long-standing vehicle purchase incentives, infrastructure support, and market-development policies that together make ZET adoption more practical for fleets. Programs such as the Clean Bus and Truck Incentive Voucher Project (HVIP) and Energy Infrastructure Incentives for Zero-Emission program (EnergIIZE) help reduce upfront vehicle and infrastructure costs through point-of-sale vouchers. Broader innovative policies like the Low Carbon Fuel Standard and Cap-and-Trade program help spur investment into zero-emission technology. These policies were guided by extensive planning through multiple zero-emission roadmaps and the state setting emission reduction targets early to align fleets, original equipment manufacturers, infrastructure providers, and others in their investments. These types of policies are not unique to California and can provide a framework for other states looking to accelerate ZET adoption.

Normalizing ZET deployments offers a more accurate picture of state-by-state progress. By leveling the playing field, we can identify true leaders in adoption and spotlight where additional support may be needed.

Florida and Texas both remain outside the top-performing states for normalized ZET score, with scores of .-23 and .04, respectively. Despite their large cumulative deployments, most of those deployments are cargo vans, which are not keeping pace with both states' large truck stock populations. This contrast highlights an important distinction between total deployments and relative market progress. States with large truck stock populations can inflate ZET deployment counts and dilute relative performance, making normalized scores especially useful for separating market size from true market momentum and for showing where adoption is occurring more broadly across different vehicle segments.

Normalizing ZET deployments offers a more accurate picture of state-by-state progress. By leveling the playing field, we can identify true leaders in adoption and spotlight where additional support may be needed. Our team will continue to refine our model and approach in future iterations of the report to better understand where and why ZET adoption is accelerating across the country.

3 Conclusion: Best ZET Deployment Share to Date

Overall, the latest data indicates that the U.S. ZET market continued to mature in 2025, as growth became more geographically distributed and less concentrated in a single vehicle segment than in 2024. However, cargo vans continued to account for the overwhelming majority of deployments. The second half of 2025 marked the strongest 6-month performance period for ZET deployments to date, reaching a deployment share of 4.14%, above the previous high of 3.13% in the first half of 2023. Cargo vans remained the dominant source of deployments and rebounded strongly in the second half of the year, more than doubling the first-half total. At the same time, gains across yard tractors, refuse trucks, and MD step vans indicate that adoption is expanding across a wider range of applications, with yard tractors continuing to lead all segments in zero-emission market share.

The pace of future deployments will be heavily influenced by how effectively states, infrastructure providers, fleets, and other stakeholders work together to address practical barriers that shape adoption.

State-level results also reinforce the importance of leadership in shaping the ZET market. California, Florida, and Texas continue to lead cumulative deployments. Normalized results show that California, New York, and Pennsylvania are accelerating ZET deployments the most relative to the national average. With 22 states now exceeding 1,000 cumulative ZET deployments, the latest data points to a market that is becoming more broadly distributed across the country. At the same time, recent results suggest that policy and market timing continue to matter. Part of the late-2025 uptick may have been influenced by expiring tax credits, along with greater operational certainty and strong confidence in zero-emission technologies.

Looking ahead, 2026 will be a decisive year for understanding the next phase of ZET adoption. The pace of future deployments will be heavily influenced by how effectively states, infrastructure providers, fleets, and other stakeholders work together to address practical barriers that shape adoption. Financial support, infrastructure planning, policy certainty, and education will remain important in determining how quickly the market continues to expand. The results in this update point to a market that is still advancing, with stronger progress to come where policy, planning, and deployment conditions are aligned.

Appendix: Definitions, Data Sources, and Assumptions

This update provides a concise, current snapshot of the dynamic U.S. medium- and heavy-duty truck market as of December 2025. It presents deployment statistics for ZETs and characterizes the existing U.S. MD and HD truck market for Class 2b (8,501–10,000 lbs.) through Class 8 (33,000 lbs. and above) vehicles. These vehicles are categorized into six distinct segments: cargo vans, MD step vans, MD trucks, HD trucks, refuse trucks, and yard tractors.

ZET deployments are tracked from 2017 onward. While ZETs could have been deployed prior to 2017, they are not included in this analysis due to the technological limitations of earlier models.

Normalized ZET scores are calculated first by breaking ZET deployments up by state, year, fleet size, and vehicle segment. Our next step is to calculate the ZET deployment rate for each of these categories; we then calculate the mean and standard deviation of each rate. From these data points, we calculate a z-score:

$$Z_{segment,state,year} = \frac{(EVPercentage_{Segment,State,Year} - mean_{Segment,Year})}{Standard\ deviation_{segment,year}}$$

weighting outliers with very high scores from less than five ZETs deployed. We then average all scores by state to generate an adjusted state normalized ZET score. A z-score can be interpreted as how many standard deviations a state is from the national average, where 0 is the national average. A positive score of 1 means the state is one standard deviation above the national average, while a negative score of 1 means the state is one standard deviation below the national average. These numbers can be interpreted under the **empirical rule**, where 1 standard deviation covers 68% of all outcomes, 2 standard deviations covers 95%, and 3 standard deviations covers 99.7%.

Yard tractor deployments are likely underreported because many are not registered for on-road use, and much of the data on deployments comes from vehicle registrations. This data limitation may understate the actual adoption rate of zero-emission yard tractors in the marketplace. CALSTART assumes on-road yard tractors account for 35% of the total yard tractor population.

 State-level deployment figures represent only the 72,025 deployments for which deployment locations are known. Some deployment numbers may differ slightly from the previous market update due to corrections in the data provided by original equipment manufacturers. State totals do not equal total deployments because deployment locations are not known for all ZETs.

Table A-1: Data Sources

Data sources in Table A-1 are listed in descending order of prevalence within the dataset used to determine ZET deployments.

Data Source	Description	Specific Data Used
Private Correspondence	Author correspondence with original equipment manufacturers	ZET deployments as of December 2025
IHS Markit	Global provider of information and analysis on world markets and industries	U.S. truck registrations as of December 2025
California CORE	California's Clean Off-Road Equipment Voucher Incentive Project	Zero-emission yard tractor deployments as of December 2025
California HVIP	California's Clean Truck and Bus Voucher Incentive Project	ZET deployments as of December 2025
Public Press Releases	Press releases from original equipment manufacturers announcing delivered sales	ZET deployments as of December 2025
NYTVIP	Truck voucher incentive program administered by the State of New York	ZET deployments as of December 2025

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About CALSTART

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