



January 15, 2021

Peg Hanna (peg.hanna@dep.nj.gov)

Rob Schell (rob.schell@dep.nj.gov)

Air Monitoring and Mobile Sources

New Jersey Department of Environmental Protection

P.O. Box 420

Trenton, New Jersey 08625

Dear Ms. Hanna and Mr. Schell,

The undersigned organizations commend New Jersey for being the first state to commit to adopting California's medium- and heavy-duty vehicle (MHDV) emissions standards. In moving forward with the Advanced Clean Trucks (ACT) rule and the Heavy-Duty Omnibus (HDO) rule, New Jersey is taking a leadership role and demonstrating its strong commitment to achieving a zero-emission transportation sector. State leadership on these issues is critical – especially in the absence of protective national standards. These programs are needed to protect public health and the environment, help mitigate climate change, and stimulate the economy. With the incoming Biden Administration, there is also an opportunity for federal standards that help secure substantial emission reductions. We offer these comments on the NJ program with that context in mind.

As a general matter, we believe that a suite of policies will be necessary to achieve New Jersey's ambitious goals. That is, the ACT rule and the HDO rule, while foundational policies, are not in and of themselves sufficient to accomplish a wide-scale transition to zero-emission vehicles. Measures like a fleet rule, upfront incentives that defray or help finance the relative higher purchase price of trucks and buses, and assistance with the cost and deployment of infrastructure—along with other complementary policies—are all needed. Further, this will not be the task solely of the Department of Environmental Protection but demands an "all hands on deck" approach that includes the Board of Public Utilities (BPU), the Economic Development Authority (EDA), New Jersey utilities, and private companies, among others. A holistic approach is needed, and we encourage the DEP to review our comments under that lens. The following comments address misconceptions and frequently asked questions about the ACT and HDO rules that we have heard from stakeholders.

The ACT and HDO rules are foundational policies to transition New Jersey’s MHDV fleets to zero-emission technology.

Thanks to improving economics and forward-looking policies, the MHDV sector can head towards a zero-emission future. However, to accelerate this transition and maximize benefits, additional action is needed. The most effective action New Jersey can take to jumpstart the zero-emission MHDV market is to adopt MHDV emission standards, including the ACT rule and the HDO rule. The ACT rule will ensure zero-emission MHDVs are available for sale in New Jersey, while the HDO rule will reduce emissions from new fossil fuel MHDVs that continue to be sold. The rules work in tandem and, if adopted together, would come into effect simultaneously. They send a clear market signal around which industry, government, and other stakeholders can plan and mobilize investments. These rules were extensively researched and developed by California and follow all federal Clean Air Act requirements for adoption. New Jersey may immediately initiate the regulatory process to adopt these rules, finalize them by the end of 2021, and begin enforcement for vehicle model year 2025 (calendar year 2024), contingent on California receiving a federal waiver from the U.S. EPA under the Clean Air Act.

On a total cost of ownership basis and without incentives, certain zero-emission trucks are less expensive than fossil fuel trucks today and most classes of vehicles are expected to achieve total cost of ownership parity by 2030.

Although electric truck purchase prices are rapidly declining, they remain higher than most comparable diesel trucks. However, electric trucks are attractive on a total cost of ownership (TCO) basis due to fuel cost savings from charging with potentially less expensive electricity and anticipated 50% lower maintenance costs than a comparable diesel or gasoline vehicle.¹ In many cases, these savings will compensate for higher up-front vehicle costs. It is important to remember that upfront vehicle costs will continue to fall as battery prices decline. According to Bloomberg New Energy Finance, battery costs have decreased by 89% over the past 10 years and are continuing to drop.² Additionally, electric trucks’ residual costs are expected to be higher than used diesel trucks because a purchaser will be purchasing a more reliable truck with much lower fuel and maintenance costs.³ Meanwhile, financial institutions are exploring ways to pull forward expected fuel and maintenance cost savings to further reduce electric MHDV purchase prices.⁴

Zero-emission trucks have already reached or surpassed TCO cost parity with fossil fuel counterparts in several applications without incentives, and most are expected to do so by 2030.⁵ According to a New Jersey-based study, favorable TCOs mean that “widespread vehicle electrification is a lower cost option compared with a market that continues to purchase and use only ICE vehicles thru 2050.”⁶ Charts showing TCO break-even points by class and use are in this letter’s appendix.

New Jersey is already reducing costs for the light-duty EV market and laying the foundation to support the electric MHDV market. For example, the New Jersey Economic Development Authority plans

¹ https://escholarship.org/uc/item/7s25d8bc#article_main

² <https://about.bnef.com/blog/battery-pack-prices-cited-below-100-kwh-for-the-first-time-in-2020-while-market-average-sits-at-137-kwh/>

³ <https://www.oberoninsights.com/insights/residual-value>

⁴ <https://www.forbes.com/sites/sebastianblanco/2019/04/18/proterra-ready-for-electric-bus-battery-leasing-with-200-million-credit-facility/?sh=4f2a81ae2314>

⁵ Comparison of Medium- and Heavy-Duty Technologies in California. ICF, Dec. 2019

⁶ <http://www.chargevc.org/wp-content/uploads/2020/10/ChargeVC-Full-Market-Electrification-Study-FINAL-Oct-7-2020.pdf>

to use a portion of RGGI funds for MHDV purchase incentives.⁷ The Port Authority of New York and New Jersey's Clean Truck Replacement program pays fleet owners up to 50% of the cost to replace heavily polluting trucks with clean alternatives. The Port also exempts zero-emission drayage trucks from its requirements that trucks meet or exceed 2010 federal engine standards.⁸ In addition, Governor Murphy recently signed the Plug-in Vehicle (PIV) Act, which directs the Department of Environmental Protection (DEP) to establish goals for MHDV electrification.⁹

As others rightly identified, fleets are commercial entities with a fiduciary responsibility to make rational business decisions. Their actions demonstrate that zero-emission vehicles are part of that decision: fleets around the country are lining up to buy electric trucks with tens of thousands of preorders from household names such as the US Postal Service,¹⁰ Amazon,¹¹ and PepsiCo.¹² Pent-up demand unmet by traditional original equipment manufacturers (OEMs) has ushered in a slew of new truck manufacturers such as Lordstown Motors,¹³ Lion Electric, Arrival and Rivian, who are racing to deliver products that are being sold even before they come off the assembly line.¹⁴ Some OEMs, such as Freightliner and Mack, already have electric trucks in commercial operation. Collectively, these companies have 125 zero-emission truck and bus models that are in production, development, or demonstration.¹⁵ The growth of these new entrants, combined with global trends towards zero-emission technology, have led legacy OEMs, including Volvo,¹⁶ Daimler,¹⁷ Peterbilt,¹⁸ and Ford, to mount well-funded and aggressive programs to bring electric vehicles to their customers within 6-12 months. However, it will take time for production to scale up and initial sales will go to states with favorable regulatory environments.

The ACT rule will soon be accompanied by purchase requirements that will further stimulate participating states' zero-emission truck market. California plans to finalize an aggressive fleet purchase requirement by 2022, which other states can then adopt. In a recent PACT presentation, the DEP noted that New Jersey would develop fleet purchase requirements once they have vital operation data collected by the ACT rule.¹⁹

Adopting the ACT rule will act as an accelerator to increase the supply of electric trucks in New Jersey, achieve economies of scale from higher production volumes, lower costs, and encourage solutions to increase demand. New Jersey is beginning to lay the groundwork for a thriving zero-emission MHDV market. However, what remains missing is a diverse and reliable supply of zero-emission vehicles available today. Fleet owners and operators are banding together in groups such as the Corporate Electric Vehicle Alliance (CEVA) to loosely aggregate and signal strong demand for more diverse medium- and heavy-duty ZEV model options.²⁰

⁷ Carey, Victoria. Dumping Diesel: Electrifying Buses and Trucks in New Jersey. 7 Dec. 2020. Webinar.

⁸ New Jersey Laws and Incentives, Alternative Fuels Data Base. Available at: <https://afdc.energy.gov/laws/all?state=NJ>

⁹ https://www.njleg.state.nj.us/2018/Bills/S2500/2252_U2.PDF

¹⁰ <https://www.trucks.com/2021/01/04/workhorse-group-electric-delivery-truck-order/>

¹¹ <https://www.theverge.com/2019/9/19/20873947/amazon-electric-delivery-van-rivian-jeff-bezos-order>

¹² <https://www.reuters.com/article/us-pepsico-tesla-orders/pepsico-makes-biggest-public-pre-order-of-tesla-semis-100-trucks-idUSKBN1E61FB>

¹³ <https://www.post-gazette.com/business/auto/2021/01/12/Electric-truck-maker-hits-100-000-orders-ahead-of-fall-start/stories/202101120097>

¹⁴ Downing, S. 8 Electric Truck and Van Companies to Watch in 2020, GreenBiz. Jan 2020.

¹⁵ Sharpe, B et al, [Race to Zero - How manufacturers are positioned for zero emission commercial trucks and buses in North America](#),

International Council on Clean Transportation and Environmental Defense Fund, October 2020.

¹⁶ <https://electrek.co/2020/12/03/volvo-trucks-starts-sales-of-vnr-electric-class-8-truck-ahead-of-production/>

¹⁷ <https://electrek.co/2020/12/03/daimler-investment-mostly-toward-accelerating-electrification/>;

<https://www.thedrive.com/tech/35305/freightliners-battery-powered-semi-trucks-have->

¹⁸ [HTTPS://WWW.PETERBILT.COM/ABOUT/NEWS-EVENTS/NEWS-RELEASES/PETERBILT-MODEL-579EV-NOW-AVAILABLE-FOR-CUSTOMER-ORDERS](https://www.peterbilt.com/about/news-events/news-releases/peterbilt-model-579EV-now-available-for-customer-orders)

¹⁹ <https://www.nj.gov/dep/workgroups/docs/njpact-20201221-pres.pdf>

²⁰ <https://www.ceres.org/our-work/transportation/corporate-electric-vehicle-alliance>

Deploying electric truck infrastructure is technically and economically feasible and offers a host of potential benefits.

Meeting the electric infrastructure needs to support the deployment of MHD battery electric vehicles (BEVs) is technically feasible. The expected generation and capacity needs for BEVs over the next half-century are below historical annual growth rates. For example, there have been periods of rapid electric demand growth in the US associated with home electrification and the addition of household appliances (1970-75) and with the widespread adoption of air conditioning (1990-95). These years saw annual generation increases equal to the needs of tens of millions of BEVs.²¹ The challenge of MHD BEVs is not technological.

Medium-duty commercial trucks make up about 50% of New Jersey's truck fleet. These trucks range from Class 23 BEVs can charge using low- to medium-power charging stations (6.6-19 kW AC) with the existing standardized connectors that light-duty vehicles use; some may use higher-power (50 kW) direct current fast chargers (DCFCs). A significant portion of these vehicles will have relatively short daily mileage requirements and can be depot charged overnight. These BEVs can also take advantage of public charging infrastructure, which will help defray costs and increase utilization rates. Therefore, the potential power needs of a significant share of the truck fleet exist within the utility realm of familiarity.

There are many potential benefits to developing a robust electric charging network for MHD BEVs. For example, due to the large battery size and predictable operation schedules, MHD BEVs are prime candidates for vehicle-to-grid applications. Vehicle-to-grid technologies can improve grid stability and reliability, help integrate more renewable energy, and in some applications, possibly offer additional revenue streams to BEV owners. Another advantage to the infrastructure buildout is high-quality job creation.²²

In 2019, over a quarter-million Americans were employed in the clean vehicle industry.²³ To date, over \$300 billion in global private investments have flowed into electric vehicles.²⁴ Moreover, thanks to the lower cost of filling up with electricity rather than fossil fuels and lower maintenance costs, electric vehicles save fleets and consumers money. These savings are largely redirected towards local services—the most labor-intensive and skill-diverse sector of the economy—and are less likely to be outsourced.²⁵ Shrinking and shifting expenditures from diesel and gasoline to the labor-intensive service industry will serve as a potent job creator and economic stimulant.

By signing the Multi-State Medium- and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding in July 2020, New Jersey identified an initial goal of all new truck and bus sales being zero-emission by 2050 and 30% of new sales being zero-emission by 2030. The state also plans to electrify the NJ Transit Corporation's bus fleet by 2032 and install 400 DCFCs and 1,000 Level 2 chargers across 200 locations by 2025. These targets are the hallmark of a state committed to transportation electrification. Although charging infrastructure will require further development, the political will is clear, and the economic and public health benefits are compelling. As the ACT and HDO rulemakings progress, it is reasonable to assume robust support from state agencies and industry stakeholders, and New Jersey EDCs to support infrastructure investments and advance MHDV-focused programs. A key partner will be New

²¹ [Summary Report on EVs at Scale and the US Electric Power System](#)

²² Clean Jobs, Better Jobs. E2, ACORE, CELI. 2020. Available at: <https://e2.org/wp-content/uploads/2020/10/Clean-Jobs-Better-Jobs.-October-2020.-E2-ACORE-CELI.pdf>

²³ <https://e2.org/reports/clean-jobs-america-2020/>

²⁴ <https://www.atlasevhub.com/materials/private-investment/>

²⁵ <https://ww2.energy.ca.gov/2018publications/CEC-500-2018-013/CEC-500-2018-013.pdf>

Jersey's utilities, who must expand programs to support infrastructure buildout manage the new load in a way that optimizes the grid and provides benefits to all customers and develop new rates to support transportation electrification for commercial and industrial customers.

The ACT and HDO rules are built around flexibility and designed for an evolving market with segments in different stages of electrification suitability.

The ACT rule starts with low sales requirements and gradually increases, leaving time for technology to improve, the supporting ecosystem to mature, and vehicle prices to decline. The ramp-up in sales requirements is modest: from adopting the rule in 2021 to the second year of compliance in calendar year 2025, the sales requirement will grow to only 10-13%. We can expect significant advancements in range and efficiency in the intervening years, expanding suitability for a wider spectrum of zero-emission vehicle uses and classes. The HDO rule follows a comparable transition with stronger emission standards beginning in model year 2024 and then tightening further in model year 2027.

A recent study predicts that nearly every MHDV type in New Jersey will be cost-competitive with or preferred over internal combustion engine vehicles by 2035.²⁶ While unique use cases that are harder to electrify, such as snowplows, may persist, the overwhelming majority of New Jersey's truck fleet will be suitable for a transition to zero-emission vehicles over the rules' lifetime, and these exceptions should not dictate the rule. Further, both the ACT and HDO rules employ credit mechanism systems that incentivize voluntary early action and permit a high degree of compliance flexibility. For example, the ACT rule allows zero-emission credit trading between manufacturers and between most truck classes, accounting for vehicle size, enabling manufacturers to shift credits from truck segments ripe for electrification to those that are less suitable.

The ACT rule can accommodate potential fluctuations in vehicle sales from year-to-year. The rule does this by basing manufacturers' ZEV credit requirements on average truck sales data from the previous three years. In that way, peaks or troughs in purchases due to economic or regulatory forces are smoothed and have minimal impact on the overall trajectory of ZEV sales.

The HDO rule is a vital complement to the ACT rule with substantial public health and environmental benefits.

Despite making up only around 5% of New Jersey's vehicles, heavy-duty vehicles (HDVs) are responsible for over 40% of NOx pollution from the transportation sector.²⁷ NOx contributes to ozone and the formation of secondary particulate matter (PM), which, along with primary particulate matter (PM) emissions (elemental black carbon), are associated with an increased risk of premature deaths, hospitalization, and ER visits. Numerous respiratory and cardiovascular diseases are linked to these pollutants, such as asthma, decreased lung function, heart attacks, and lung cancer.²⁸

Reducing NOx and PM emissions is vital for improving public health and meeting the federal National Ambient Air Quality Standards for ozone and fine particulate matter (PM2.5). Cleaning up HDV emissions is long overdue for the communities living adjacent to freeways, ports, and freight hubs that

²⁶ Full Market Vehicle Electrification in New Jersey. ChargeEVC, Oct. 2020. Available at: <http://www.chargevc.org/wp-content/uploads/2020/10/ChargeEVC-Full-Market-Electrification-Study-FINAL-Oct-7-2020.pdf>

²⁷ Full Market Vehicle Electrification in New Jersey. ChargeEVC, Oct., 2020. Available at: <http://www.chargevc.org/wp-content/uploads/2020/10/ChargeEVC-Full-Market-Electrification-Study-FINAL-Oct-7-2020.pdf>

²⁸ <http://www.stateoftheair.org/health-risks>

disproportionately suffer from harmful air pollution. A Newark-focused analysis found that “the highest transportation emissions burden can be found in locations close to high density truck and bus routes and locations close to port facilities and rail yards.”²⁹ The communities most burdened by this pollution are predominantly communities of color and low-income communities.³⁰

The HDO rule makes much-needed reforms, such as strengthening NO_x and PM emission standards for new fossil fuel trucks, introducing a new NO_x standard for a low-load certification cycle, extending manufacturer warranties, and improving in-use testing to better align with actual operations and global standards. Moreover, the proposed emission standards are derived from nearly a decade of rigorous research and analysis demonstrating that the new requirements are not only technically feasible but cost-effective methods of emissions reduction.

The HDO rule is expected to cut NO_x emissions from HDVs by roughly 75% below current standards beginning in 2024 and 90% in 2027.³¹ In addition to cleaning up NO_x, the proposed rule looks to institutionalize PM pollution controls and prevent backsliding by adopting a more stringent standard that aligns with current industry certifications. These reductions in California are projected to amount to \$36 billion in statewide health benefits from 3,900 avoided premature deaths and 3,150 hospitalizations from 2022 to 2050. We expect to see similar economic and health benefits in New Jersey.

While the ACT rule works year-over-year to gradually increase the share of new truck sales that are zero-emission, the HDO rule dramatically curtails toxic air pollution from new diesel vehicles that will continue to be sold in the interim. These rules are two sides of the same coin: collectively enabling the state’s long-term vision of a zero-emission MHDV fleet and addressing toxic transportation pollution in the near-term.

Seven years of research and analysis informed the HDO rule to ensure it is technically feasible, cost-effective, and adheres to all legal requirements.

When developing the HDO rule, the California Air Resources Board (CARB) thoroughly evaluated the technical feasibility of the rule’s more stringent emission standards in partnership with the Southwest Research Institute, Manufacturers of Emission Controls Association, United States Environmental Protection Agency (EPA), South Coast Air Quality Management District, and engine manufacturers. The testing convincingly demonstrated and modeled cost-effective solutions to meet both 2024 and 2027 standards.³² Importantly, certification data shows that many manufacturers today certify well below current standards and nearly meet the 2024 requirements.³³ Moreover, several engine manufacturers have already committed to developing compliant 2024 model year engines and are actively making plans to meet the 2027 model year requirements.³⁴

Per CARB’s extensive economic analysis, the cost in California to manufacturers of complying with the rule is \$4.07 billion from 2022 through 2050. These costs are dwarfed by the rule’s \$36.8 billion in expected public health benefits for Californians over the same period. And, manufacturers can expect to

²⁹ http://www.njeja.org/wp-content/uploads/2020/11/NewarkCommunityImpacts_FINAL-2.pdf

³⁰ Factsheet: Inequitable Exposure to Air Pollution from Vehicles in the Northeast and Mid-Atlantic. Union of Concerned Scientists. Available at: <https://www.ucsusa.org/sites/default/files/attach/2019/06/Inequitable-Exposure-to-Vehicle-Pollution-Northeast-Mid-Atlantic-Region.pdf>

³¹ Low NO_x Heavy-Duty Omnibus Regulation Factsheet. California Air Resources Board. Available at:

https://ww2.arb.ca.gov/sites/default/files/classic/msprog/hdlow_NOx/files/HD_NOx_Omnibus_Fact_Sheet.pdf

³² https://ww3.arb.ca.gov/regact/2020/hdomnibuslow_NOx/appi.pdf

³³ https://ww3.arb.ca.gov/regact/2020/hdomnibuslow_NOx/isor.pdf

³⁴ https://ww3.arb.ca.gov/regact/2020/hdomnibuslow_NOx/res20-23attbrtc.pdf

pass on costs through higher prices. However, buyers are not without benefits: the HDO rule would lengthen manufacturer emission warranty periods, helping prevent vehicle owners from paying for repairs during that extended period. Also, the HDO's longer useful life and durability requirements would encourage manufacturers to produce more durable components, resulting in fewer failures and less downtime for vehicle owners. As a percent of baseline purchase prices, price increases are minimal and expected to range from 0.4-9.5%, with an average of 2.6% in MY 2024-2026, 5.2% in MY 2027-2030, and 5.8% in MY 2031 and beyond. Consequently, the HDO rule's cost-effectiveness is \$5.45 per pound of NOx reduced—well within the range of previously adopted emission regulations.

The ACT and HDO rules will not prompt manufacturers to exit participating markets, and fears of a pre-buy/no buy scenario are unwarranted.

The trend towards zero-emission MHDVs and the sharp curtailment of diesel emissions is global and durable. In many ways, the HDO rule is an opportunity to catch up with European regulators, while the ACT rule is a way to continue maintaining American manufacturing competitiveness relative to China. And, while the trend is global, so too are the truck manufacturers. The notion that multinational (and even multi-state) OEMs will abandon markets rather than invest and innovate is ludicrous and contrary to their stated intent.³⁵ As previously mentioned, several manufacturers are already close to meeting the initial HDO rule emission standards and have committed to developing compliant engines.

The potential impact of the HDO rule on “pre-buy/no-buy” behavior to avoid complying with more stringent standards is negligible. This is largely because the anticipated rise in purchase prices is minimal, and fleets make purchasing decisions based on additional factors, such as their own business practices, future fleet needs, economic conditions, and fuel prices.

Future national low- NOx or ZEV truck standards are uncertain, and New Jerseyans need emission reductions today.

Toxic air pollution from fossil fuel MHDVs is an urgent public health emergency. Although the federal EPA launched a Cleaner Trucks Initiative in 2018 to reduce NOx emissions from HDVs, the rulemaking is in its infancy and was delayed indefinitely in 2020. Due to federal lead-time requirements and other rulemakings at EPA, it is doubtful a national low-NOx standard could take effect before model year 2027. At a minimum, this would create a gap of several years between the HDO rule schedule and federal implementation. Notably, federal and state action is not mutually exclusive and is, in fact, complementary. New Jersey should adopt the more robust ACT and HDO rules in line with Section 177 requirements under the federal Clean Air Act while also advocating for a strong federal standard. In this way, the state can take concrete action today to address toxic air pollution from vehicles registered in-state while getting a new national standard in place to clean up out-of-state trucks that travel through New Jersey. An aggressive state rule is the only way to ensure near-term air quality improvements for all residents and truly accelerate the state's transition to a cleaner transportation future.

Conclusion

We congratulate New Jersey on its plans to adopt the ACT and HDO rules, which will bolster the state's zero-emission MHDV market and ease the long-term transition to a clean transportation sector.

³⁵ <https://www.volvotrucks.us/innovation/electromobility/>

Fundamentally, these regulations are feasible, economical, and represent a timely means of achieving necessary reductions in air pollution and greenhouse gas emissions.

Sincerely,

Kathy Harris
Clean Vehicles and Fuels Advocate
Natural Resources Defense Council, Climate & Clean Energy Program
kharris@nrdc.org

Eric Miller
NJ Energy Policy Director
Natural Resources Defense Council, Climate & Clean Energy Program
emiller@nrdc.org

Mary Barber
Director, Regulatory and Legislative Affairs
Environmental Defense Fund
mbarber@edf.org

Doug O'Malley
State Director
Environment New Jersey
domalley@environmentnewjersey.org

Sara Forni
Senior Manager of Clean Vehicles
Ceres
forni@ceres.org

Jonathan J. Smith
Staff Attorney
Earthjustice, Community Partnerships Program
jjsmith@earthjustice.org

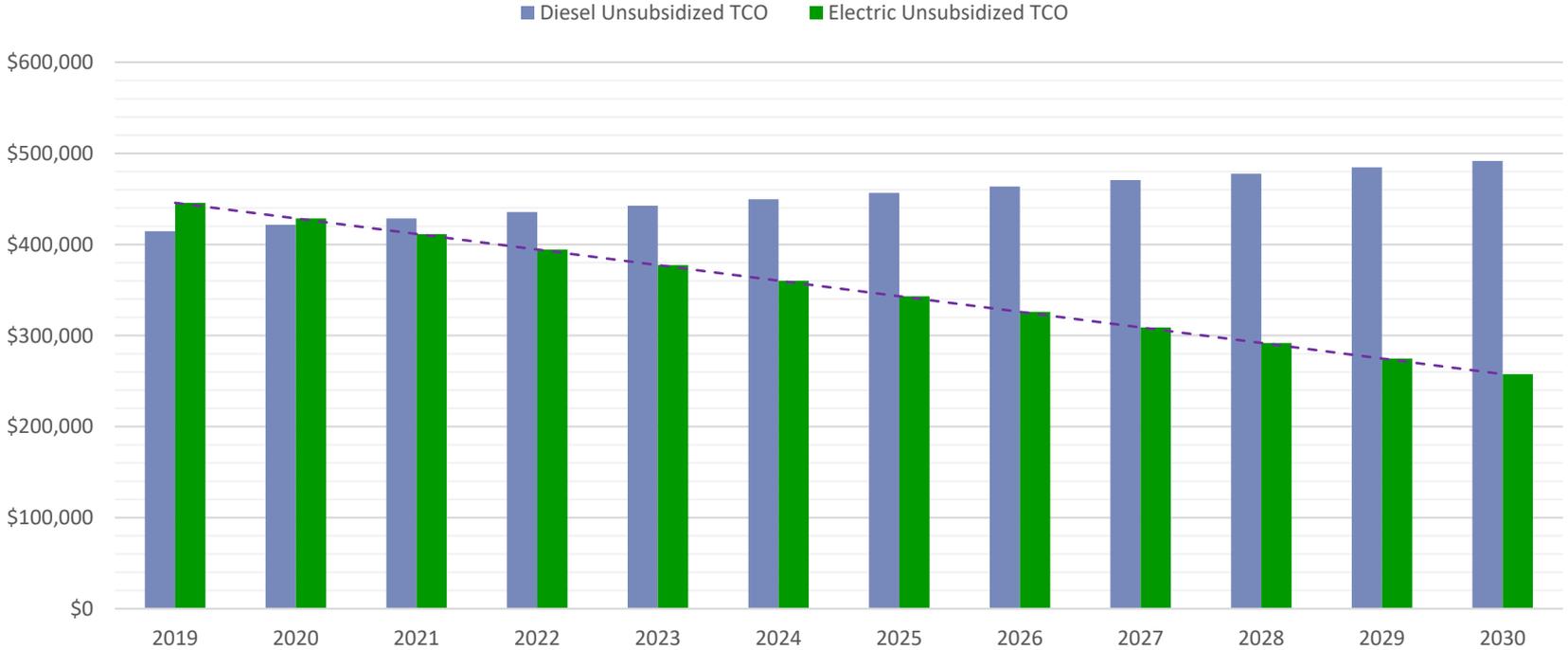


APPENDIX

Medium- and Heavy-Duty Vehicle Total Cost of Ownership Comparison: *Unsubsidized Battery Electric and Diesel*

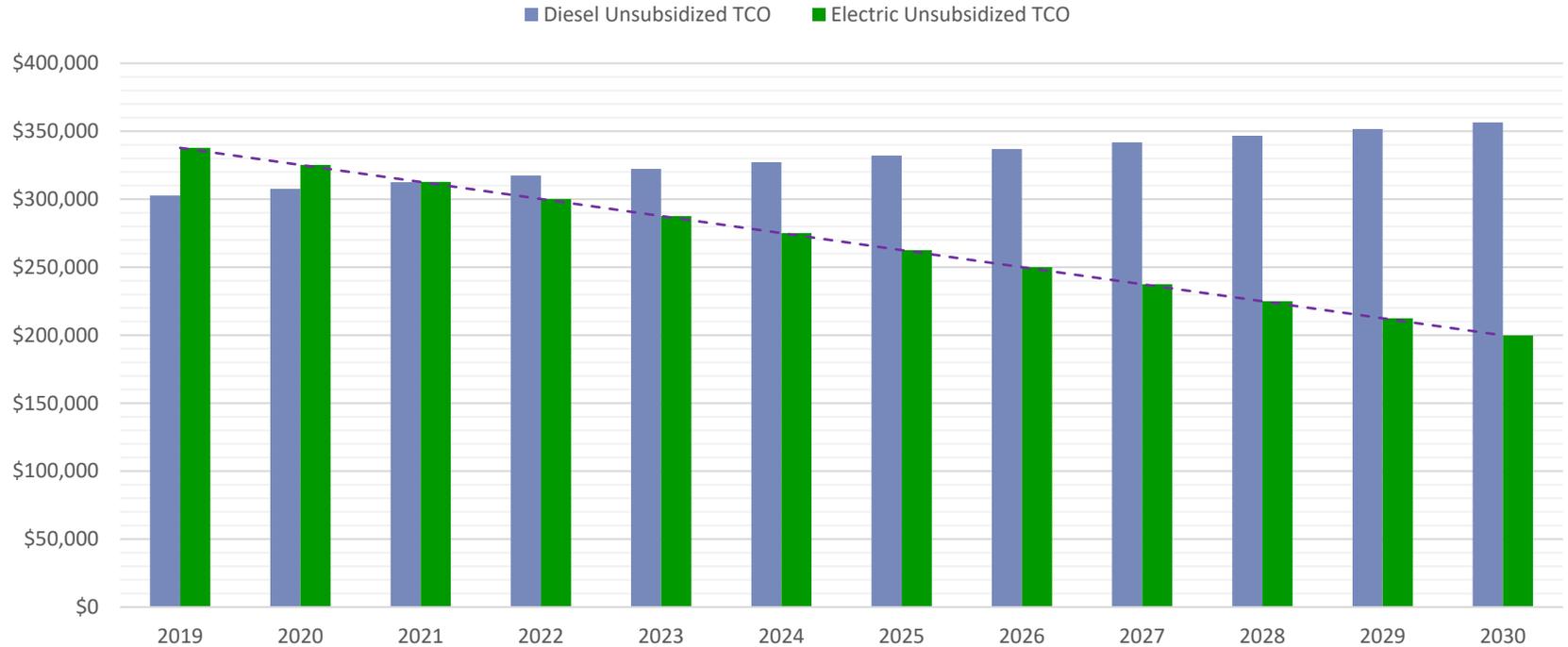
Class 8 Tractor

Class 8 Tractor



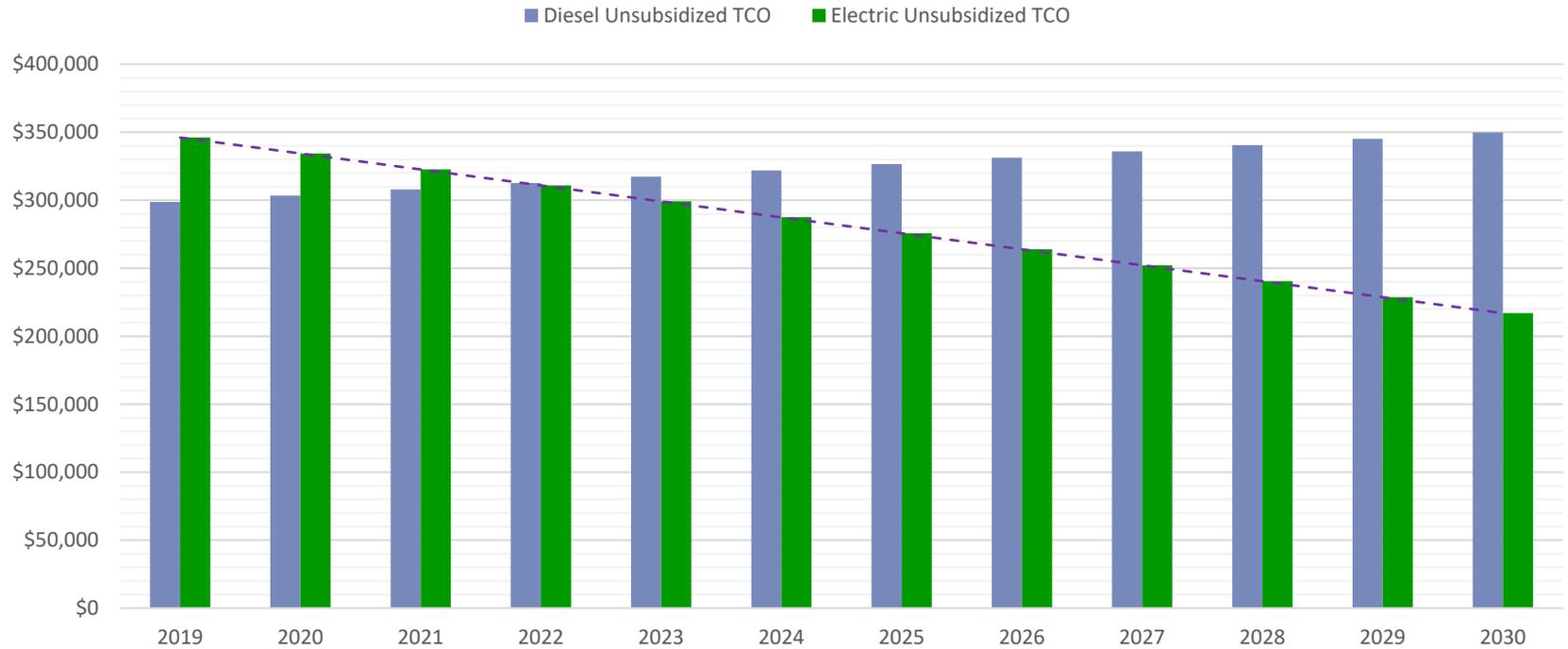
Class 8 Short Haul

Class 8 Short Haul

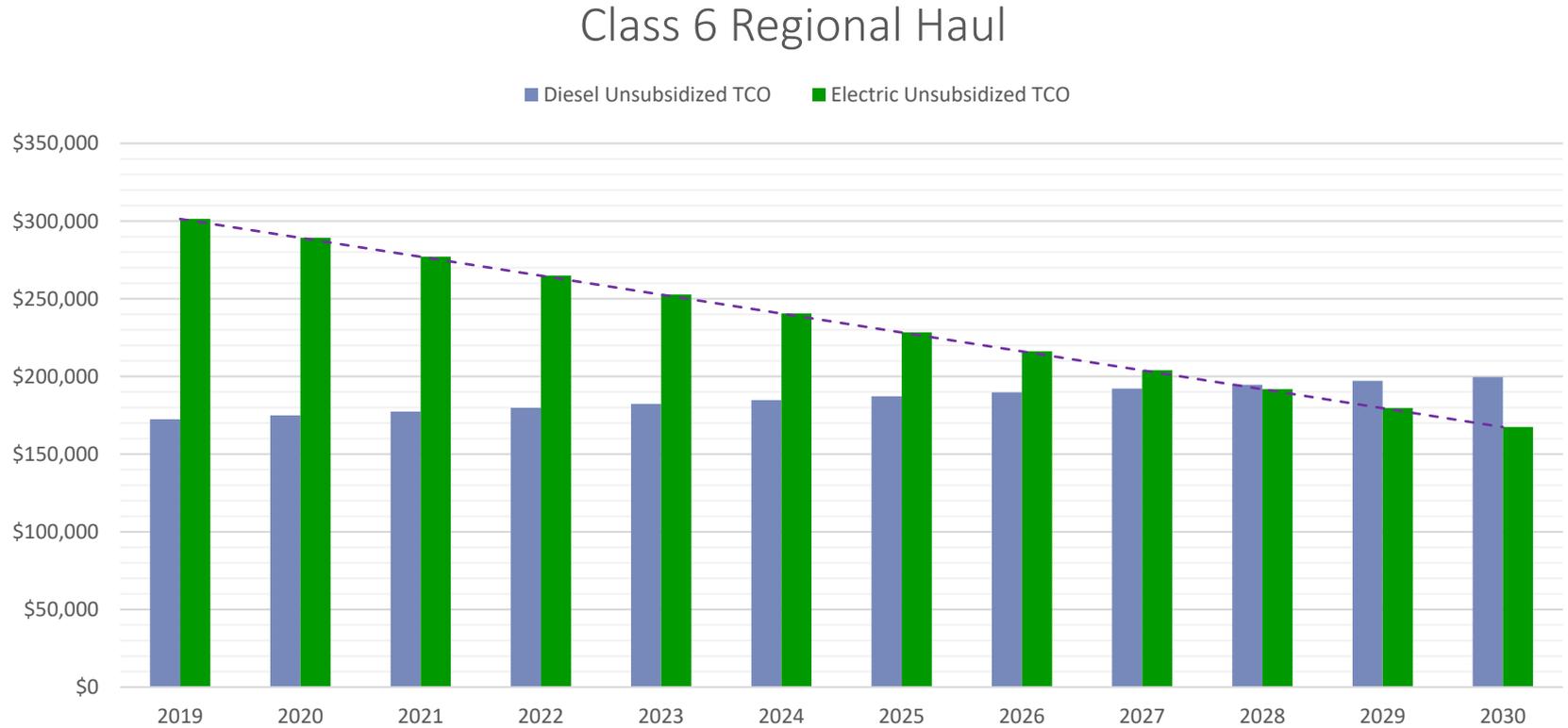


Class 8 Drayage

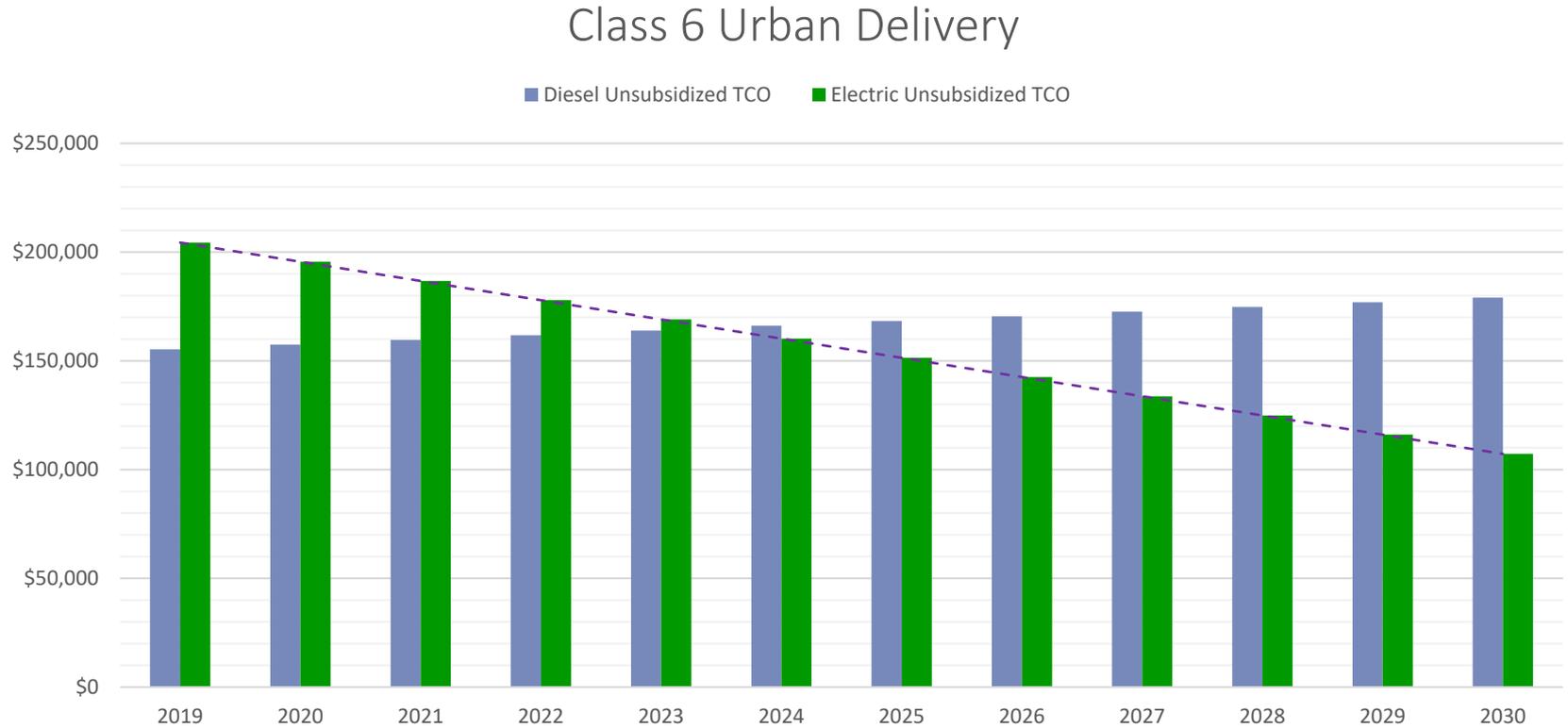
Class 8 Drayage



Class 6 Regional Haul

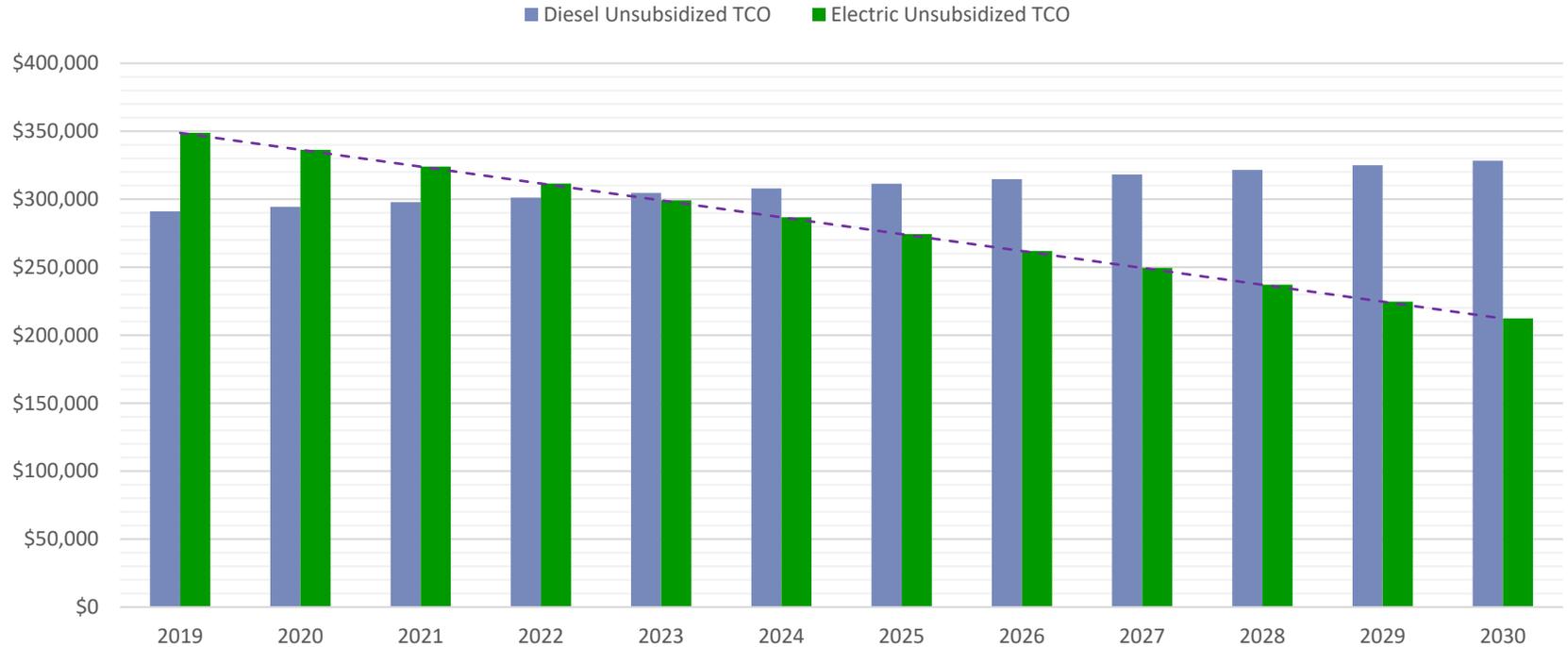


Class 6 Urban Delivery



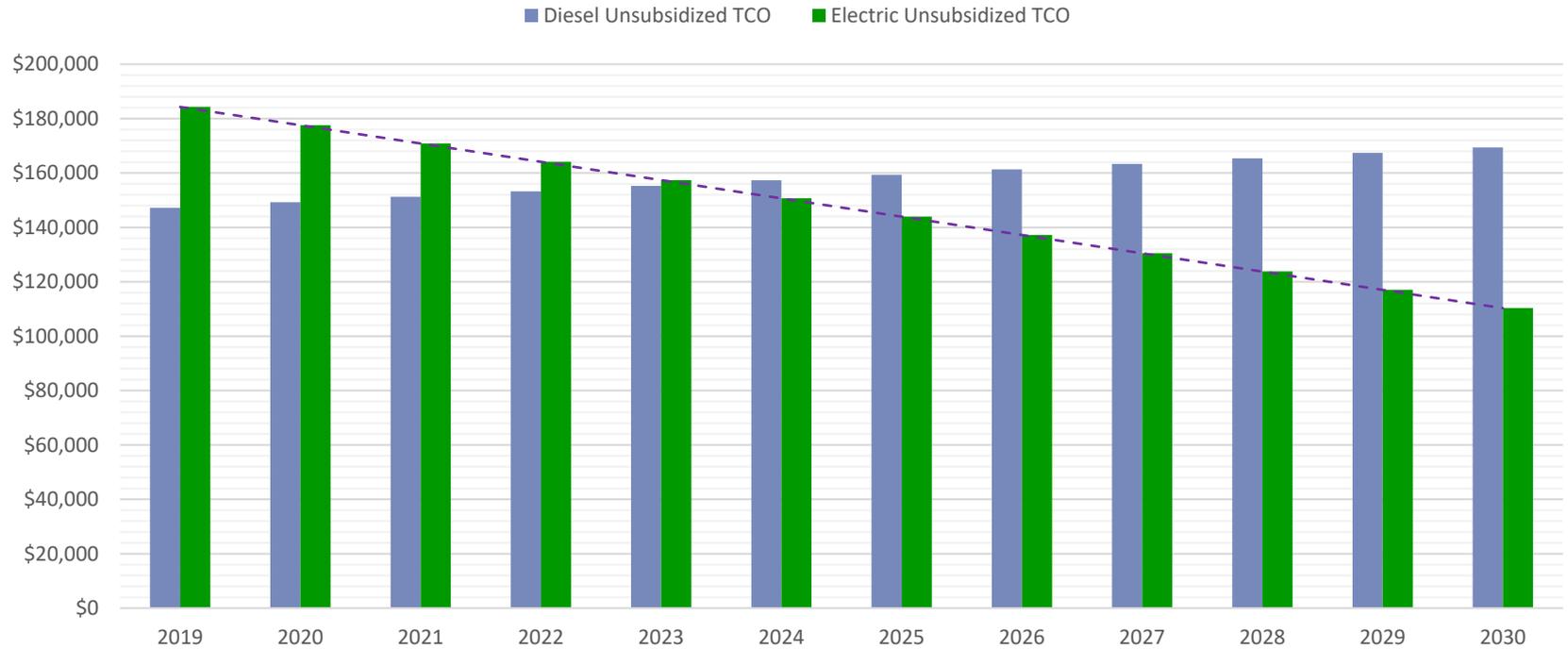
Class 4/5 Shuttle/Van

Class 4/5 Shuttle/Vans

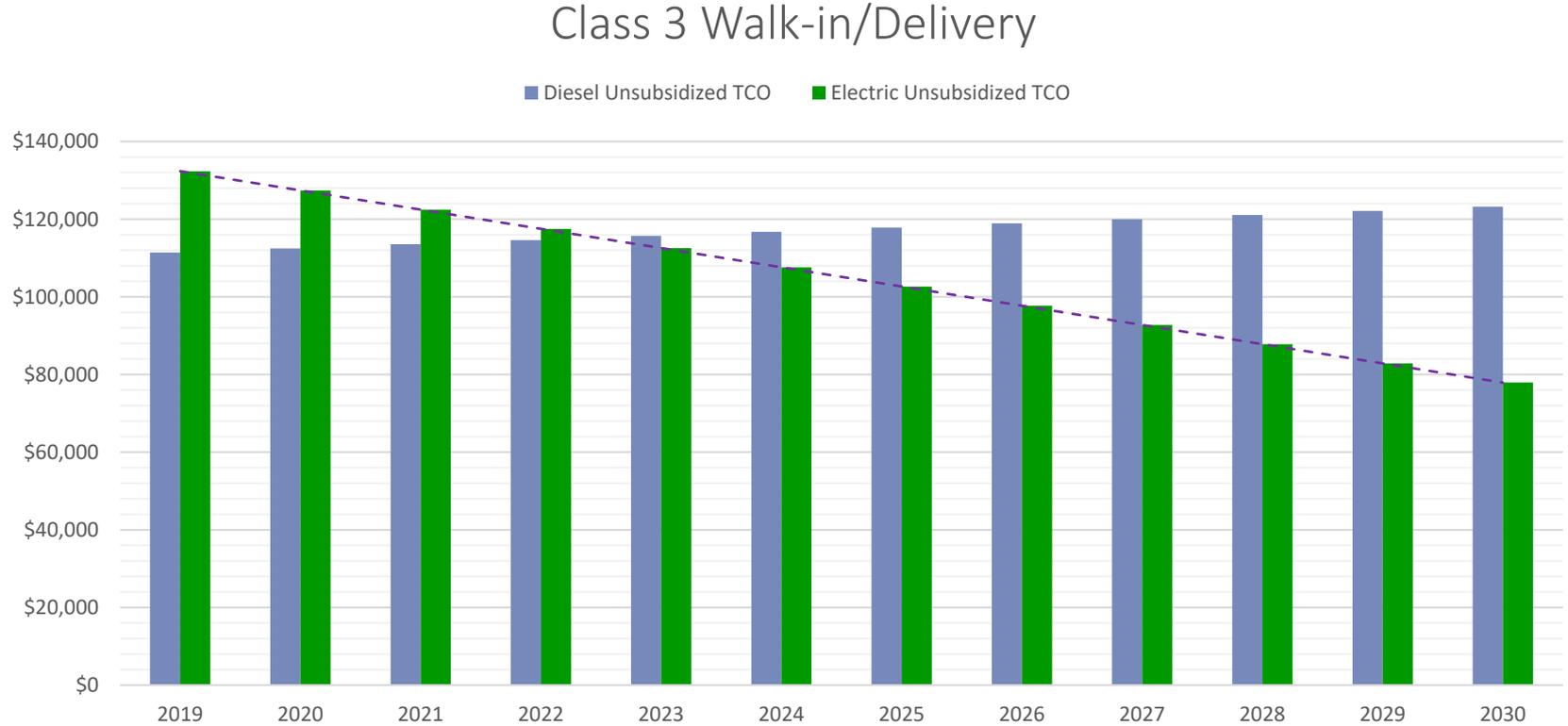


Class 4/5 Delivery

Class 4/5 Delivery

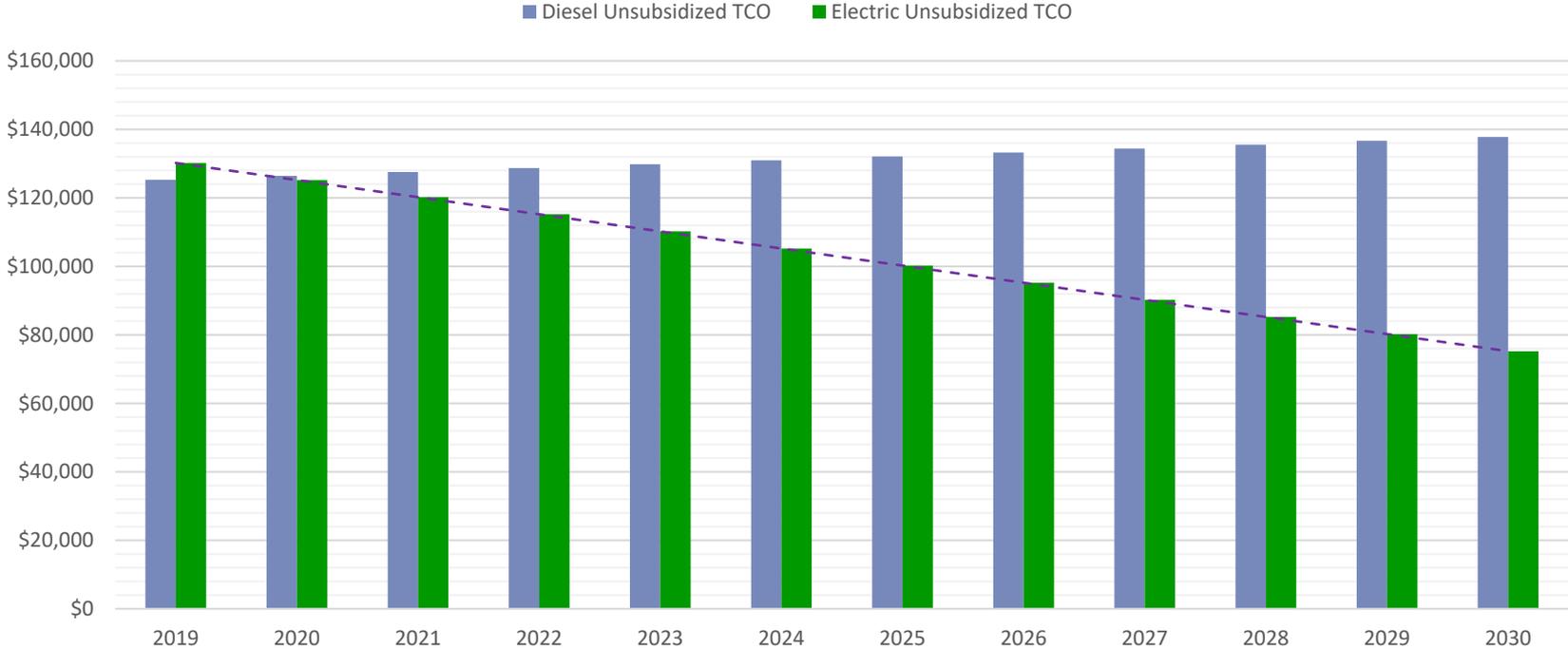


Class 3 Walk-in Delivery



Class 2b Van

Class 2b Van



Transit Bus

