ZETA | ZERO EMISSION TRANSPORTATION ASSOCIATION

February 10, 2023

U.S. Environmental Protection Agency
EPA Docket Center
Office of Air and Radiation Docket
Mail Code 28221T
1200 Pennsylvania Avenue, NW
Washington, DC 20460

RE: Docket No. EPA–HQ–OAR–2021–0427
Renewable Fuel Standard (RFS) Program: Standards for 2023–2025 and Other Changes
Submitted via Rulemaking Portal: http://www.regulations.gov.

The Zero Emission Transportation Association (ZETA) is an industry-backed coalition of 60 member companies advocating for 100% electric vehicle (EV) sales by 2030. ZETA is committed to enacting policies that drive EV adoption, create hundreds of thousands of jobs, dramatically improve public health, and significantly reduce emissions. Our coalition spans the entire EV supply chain, encompassing critical minerals developers, original equipment manufacturers, commercial fleets, charging infrastructure network operators, utility providers, and battery recyclers, among others.

We thank the United States Environmental Protection Agency (EPA) for the opportunity to comment on its notice of proposed rulemaking to set Renewable Volume Obligations (RVOs) under the Renewable Fuel Standard (RFS) for 2023-2025 and lay out a framework for renewable electricity to generate Renewable Identification Numbers (RINs or eRINs) under the program. ZETA looks forward to continuing to engage with the agency on these topics and bringing perspectives that have historically been underrepresented in the federal renewable fuel policy conversation to the fore.

ZETA applauds the agency for taking steps to implement a framework for parties to generate eRINs under the RFS. Implementable solutions to increase the use of cellulosic biofuels in the form of renewable electricity and displace imported fossil fuel, which will be best achieved by expanding transportation electrification, is a critical advancement of RFS policy and will go a long way towards achieving the Biden-Harris Administration's goal of decarbonizing the transportation sector.

ZETA urges EPA to maintain an open dialogue with all interested parties and ensure the benefits from the program extend to the entire EV supply chain. We respectfully request that the agency be responsive to the feedback received from all parties in the EV ecosystem and strive to incentivize renewable electricity to support the ongoing EV revolution.

Setting robust, achievable cellulosic RVOs will be critical to support the growth and adoption of renewable electricity under the RFS. Therefore, ZETA urges EPA to raise the proposed cellulosic RVOs for 2024 and 2025 and encourages the agency to refrain from waiving them in future actions as doing so would create uncertainty in the RIN markets and risk stranding investments. We also urge the agency not to undermine demand for eRINs by granting unwarranted small refinery exemptions (SREs) and to uphold the SRE policy announced in June 2022.

In regards to timing of the final rule, ZETA notes that EPA is under a consent decree to issue *only* the 2023 RVOs by June 14, 2023. We strongly urge EPA to issue a final rulemaking setting RVOs through 2025 and establishing an eRINs framework that delivers value to the entire EV supply chain by June 14, 2023. Doing so will provide regulatory certainty for all parties and ensure renewable electricity can begin generating eRINs in 2024. Any delay in finalizing the eRINs provisions would likely delay implementation beyond 2024, discouraging capital investment and amounting to a missed opportunity to capitalize on the substantial momentum behind transportation electrification and decarbonization.

Lastly, we encourage the agency to host multiple technical assistance workshops prior to implementation of an eRINs framework that incorporates parties that have not historically been included in the RFS program. Doing so will be critical to ensure compliance with all regulatory requirements and smooth program implementation. We also encourage EPA to develop written guidance specific to the eRINs framework and ensure that eligible applicants are registered ahead of the January 1, 2024 implementation date so they can begin generating RINs immediately.

ZETA and our member companies appreciate the opportunity to comment on this proposed rule and have included more detailed comments below. If you have any questions or concerns, please contact me at 310-773-1901.

Albert Gore
Executive Director

I. Introduction

The Zero Emission Transportation Association (ZETA) appreciates the opportunity to comment on EPA's notice of proposed rulemaking[1] to set Renewable Volume Obligations (RVOs) under the Renewable Fuel Standard (RFS) for 2023-2025 and lay out a framework for renewable electricity to generate Renewable Identification Numbers (RINs or eRINs) under the program. ZETA commends EPA's articulation of several frameworks under which renewable electricity can generate RINs. This proposed rulemaking is a critical step forward for the RFS and will help achieve the Biden-Harris Administration's goals[2] of decarbonizing the transportation sector.

However, we believe there are some key areas where the eRINs framework can be improved and strengthened, which we discuss further in the comments below. In addition, ZETA encourages the agency to finalize robust RVOs that drive demand for renewable electricity and set a strong market signal to unlock increasing amounts of capital. We also encourage the agency to uphold the final RVOs by not waiving volumes or exempting obligated parties in any future actions.

In regards to timing of the final rule, ZETA notes that EPA is under a consent decree[3] to issue only the 2023 RVOs by June 14, 2023. We strongly urge EPA to issue a final rulemaking setting RVOs through 2025 and establishing an eRINs framework that delivers value to the entire EV supply chain by June 14, 2023. Doing so will provide regulatory certainty for all parties and ensure renewable electricity can begin generating eRINs in 2024. Any delay in finalizing the eRINs provisions would likely delay implementation beyond 2024, discouraging capital investment and amounting to a missed opportunity to capitalize on the substantial momentum behind transportation electrification and decarbonization.

II. Comments on the Proposed Regulatory Program for Renewable Electricity (eRINs)

This proposed action is a significant first step in the transition away from biomass-based liquid transportation fuels, whose environmental benefits have recently come into serious doubt.[4] While ZETA applauds the hard work EPA has undertaken to design the eRINs framework, we have identified some areas we believe would strengthen and improve implementation while preserving programmatic integrity. We also believe that EPA is well within its statutory authority to create an eRINs framework and that doing so will realize Congressional intent to expand the use of cellulosic biofuels.

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[1] *See* 87 FR 80582 (December 30, 2022)
[2] The U.S. National Blueprint for Transportation Decarbonization (January 2023) https://www.energy.gov/sites/default/files/2023-01/the-us-national-blueprint-for-transportation-decarbonization.pdf
[3] *Growth Energy* v. *Regan, et al.,* No. 1:22-cv-01191 (D.D.C.)
[4] Lark, T. J., Hendricks, N. P., Smith, A., Pates, N., Spawn-Lee, S. A., Bougie, M., Booth, E. G., Kucharik, C. J., & Gibbs, H. K. (2022). Environmental outcomes of the US Renewable Fuel Standard. Proceedings of the National Academy of Sciences, 119(9). https://doi.org/10.1073/pnas.2101084119

Congress Sought to Expand the Use of Cellulosic Biofuels, Including Renewable Electricity

Congress sent an unequivocal signal with the enactment of the Energy Policy Act of 2005,[5] as amended by the Energy Independence and Security Act (EISA) of 2007,[6] that it intended the RFS to be a mechanism for growing the market and accelerating the uptake of renewable transportation fuels derived from cellulosic feedstocks. In addition to reducing American dependence on foreign energy sources, renewable transportation fuels derived from cellulosic feedstocks can reduce emissions and promote the deployment of advanced transportation technologies.

In Clean Air Act (CAA) §211(o)(2)(B), Congress called for significant increases in the production and use of cellulosic biofuels, starting with 100 million gallons per year in 2010 and increasing to 16 billion gallons per year in 2022. However, the transportation fuel market evolved in that timeframe and liquid cellulosic biofuels have failed to meet Congressional expectations. As a result, EPA has been forced to exercise its CAA §211(o)(7)(D) waiver authority to reduce cellulosic biofuel requirements through rulemaking due to inadequate domestic supply repeatedly since the inception of the RFS. The result is now an opportunity for renewable electricity to fill the gap.

Congress contemplated including renewable electricity as an eligible renewable fuel type in the statute when it directed EPA to "conduct a study on the feasibility of issuing credits under [the RFS] to electric vehicles powered by electricity produced from renewable energy sources."[7] However, the transportation sector looked much different in the mid-2000s than it does today. As the sector has matured with the rapid development of zero-emission vehicles and associated infrastructure in the intervening years, EPA should seize this opportunity to realize the intent of Congress and finalize a rule that incentivizes the increased use of renewable electricity for transportation.

EPA Has the Authority to Implement an eRINs Program

While Congress automatically incorporated certain fuel types and feedstocks into the RFS by statute, CAA §211(o)(1) gives the Administrator authority to determine whether certain fuels, feedstocks, and production processes ("pathways") qualify to generate RINs. While there are many examples of EPA exercising its RFS authorities, the most relevant in this case is the inclusion of renewable electricity from renewable biomass in the 2010 "Regulation of Fuels and Fuel Additives: Changes to Renewable Fuel Standard Program" final rule.[8] This public, notice-and-comment process provided stakeholders ample opportunity to challenge EPA's

[5] Public Law 109-58 (2005)
[6] Public Law 110-140 (2007)
[7] *See* EISA §206, Pub. L. 110-140 (Dec. 19, 2007)
[8] *See* 75 FR 14670 (March 26, 2010)

authority to include renewable electricity as a qualifying fuel type under the RFS. At the time however, EPA declined to assign a D code to renewable electricity from renewable biomass and instead deferred to the pathway petition process established in the final rule.

Four years later, EPA implicitly acknowledged the lack of growth in the liquid cellulosic biofuel market in 2014 when it approved a pathway petition for renewable electricity from biogas in the "Pathways II" final rule.[9] This was done after a lengthy analysis of lifecycle greenhouse gas emissions and as in 2010, followed a public notice-and-comment process. However, the agency never finalized a framework under which parties could generate eRINs. In light of this, today's proposed rule is the logical final step and should be viewed as more akin to guidance for stakeholders seeking to utilize the long-approved pathway at registration.

In summary, EPA is well within the scope of its CAA authority to implement an eRINs program and has provided stakeholders ample opportunity over nearly fifteen years to raise concerns. We look forward to continuing to engage with the agency as implementation of the eRINs program progresses.

The Financial Incentives for eRINs Should Benefit the Entire EV Supply Chain

ZETA encourages EPA to maintain an open dialogue with all interested parties to ensure the benefits from the program extend to the entire EV ecosystem, including vehicle manufacturers, charging providers, utilities, and others that have a direct role in the deployment of EVs. We request that the agency be responsive to the feedback received from all parties throughout the electric vehicle supply chain and strive to incentivize renewable electricity to support transportation electrification and decarbonization.

We also believe that upholding the integrity of the RFS and preventing the double-counting of eRINs should remain paramount. Ensuring that each eRIN represents a specific volume of renewable electricity will be critical to instilling confidence in the program and creating a foundation for future growth. Obligated parties who acquire eRINs should be certain the eRINs they acquire are valid and can be safely used for demonstrating compliance with the RFS.

The Revised 6.5 kWh/RIN Equivalence Value is Appropriate and Should be Finalized as Proposed

ZETA appreciates the logical and clear methodology EPA articulated in the proposed rule for revising the equivalence value for renewable electricity from 22.6 kWh/RIN to 6.5 kWh/RIN. We support this revision as it results in a more accurate and fairer treatment for RIN generation

[9] *See* 79 FR 42128 (July 18, 2014)

from renewable electricity under the RFS. We encourage EPA to finalize the 6.5 kWh/RIN equivalence value as proposed.

EPA Should Revise its eVMT Assumption to 12,250 mi/yr to Better Reflect Real-World BEV Usage

Accurate eRIN generation calculations are essential to ensuring the appropriate amount of eRINs are generated under the program. ZETA is generally supportive of EPA's proposed methodology and agrees with the proposed EV efficiency value of 0.32 kWh/mi. However, we believe the eVMT assumption of 7,200 mi/yr for BEVs is significantly lower than real-world usage and should be revised upwards.

Multiple data sources and reports point to an average eVMT for personal BEVs to be more in the 11,000 to 14,000 mi/yr range. For example, a February 2021 report[10] from the UC Davis Institute of Transportation Studies found that BEVs are driven on average about 11,000 to 13,000 mi/year. Public data from California's LCFS program[11] supports EVs driving 11,900 to 12,500 mi/year (during years where driving habits were not affected by the Covid-19 pandemic) with that efficiency based on telematic and reported charging data. Accordingly, ZETA recommends EPA adopt an eVMT assumption of 12,250 mi/yr which is consistent with available data. Also, as the average BEV range will continue to increase in the coming years, we encourage EPA to regularly revisit the eVMT value as new data becomes available.

As discussed further in our comments below, we encourage EPA to include commercial medium- and heavy-duty (MHDV) EVs in the eRINs program and in doing so, we recommend EPA develop a separate eVMT assumption for these types of vehicles. Electric MHDVs are able to deliver more eVMT per year due to their increased usage relative to personal BEVs. Considering these vehicles are often operated in fleet-based conditions, fleet owners and operators are well-positioned to identify their real world annual eVMT. We encourage EPA to work with fleet owners and operators to leverage their data as well as incorporating other data sources such as the agency's own Clean School Bus grant program.

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[10] https://its.ucdavis.edu/blog-post/no-electric-vehicles-arent-driven-less-than-gas-cars/

[11] CARB's Quarterly Summaries for LCFS transactions https://ww2.arb.ca.gov/sites/default/files/2022-10/quarterlysummary_103122_1.xlsx for EV charging through Q2 of 2022, under the "Fuels" tab, rows 93-95. This number can be converted from Gallons of Gasoline Equivalent (gge) to kWhs using the energy densities in the "Notes" tab. Coupling this with CARB's VIN Decoder Dataset https://ww2.arb.ca.gov/sites/default/files/2022-11/BaseCreditingData_2022_10_forposting.xlsx, which lists the on-road EVs driving on California's roads through Q2 2022 on the Data Summary Tab under "Total PEVs for Base Crediting". The data also shows the separately metered (i.e. residential EV charging) at the statewide level as well, ranging anywhere from 5.58kWh/day (beginning-pandemic) to 8.58kWh/day for this last quarter. Combining the two datasets results in a range of 2,576-3,423 kWh/yr for just at-home charging and 2,819-3,962 kWh/day for total light-duty charging (the sub-3,000 being 2020 when VMT was down across the board). EPA's proposed efficiency of 0.32kWh/mile means ~12,250 miles in "normal" years and 8,800-9,800 miles in the abnormal years of 2020 and 2021. A summary table is included in Appendix A.

EPA Should Prioritize eRIN Pathways Diversification

ZETA believes EPA should prioritize diversifying the types of feedstocks and production processes eligible to generate eRINs. EPA should expedite the review and lifecycle analysis of pathways petitions that expand the types of feedstocks available to generate renewable electricity. While biogas is the only approved option for renewable electricity, the market for biogas-derived renewable electricity is limited. Including pathways such as the biogenic portion of municipal solid waste (MSW) combusted to produce renewable electricity could be done easily under the current RFS regulations.

Other technologies such as qualified wind, solar, hydroelectric, and geothermal provide much greater capacity to drive the electrification of the transportation sector and should also be considered. While this may require Congressional action, we encourage EPA to explore its options as incorporating these pathways would provide a strong incentive to increase market penetration of renewable electricity into the transportation sector. It will also ease the implementation burden on eRIN generators by enabling them to diversify their renewable electricity sources. Expanding the types of feedstocks and production processes eligible to generate renewable electricity will also break biogas producers' potential monopoly over eligible eRINs feedstocks. Lastly, we ask that EPA approval of any additional feedstocks and/or production processes to generate eRINs come with a corresponding increase to future RVOs.

EPA Should Prioritize Public Outreach and Leverage Third Parties to Facilitate Implementation

ZETA believes that a January 1, 2024 start to eRIN generation provides sufficient lead time for participants to prepare, provided the rulemaking is finalized in June 2023. We also believe the contractual approach detailed in the proposed rule is sufficient to demonstrate biogas-derived renewable electricity is used as a transportation fuel. Since this framework is already in effect for direct use CNG/LNG, EPA is right to apply those principles for eRINs. ZETA members are committed to working with EPA to ensure the data needed to verify eRIN generation is provided in the most efficient format possible.

ZETA notes that initial recordkeeping and reporting burdens may be different for new RFS entrants versus established participants. To ease the administrative burden that some new RIN generators might face, we encourage EPA to ensure third parties are not excluded from management or consulting activities within the process. There are vendors in the marketplace with extensive backgrounds in the biogas and RIN markets who are able to assist both biofuel suppliers and RIN generators in the process.

Lastly, we urge the agency to host multiple technical assistance workshops prior to implementation of the eRINs framework as it incorporates parties that have not historically been

included in the RFS program. Doing so will be critical to ensure compliance with all regulatory requirements and smooth implementation. We also encourage EPA to develop written guidance specific to the eRINs framework and ensure that eligible applicants are registered ahead of the January 1, 2024 implementation date so they can begin generating eRINs immediately.

Renewable Electricity for Medium- and Heavy-Duty Vehicles Should be Eligible to Generate eRINs

The proposed exclusion of electric MHDVs from the eRINs program runs contrary to the Biden-Harris Administration's policy goals of electrifying the transportation fleet and advancing environmental justice.[12] The eRINs program provides a significant opportunity to reduce emissions from the MHDV fleet including mass transit buses and medium-duty passenger vehicles. As noted in the United States National Blueprint for Transportation Decarbonization:[13]

> "While MHDVs represent only 5% of total vehicles on the road, they are responsible for an outsized 21% of transportation emissions, making them the second-largest emissions contributor behind only light-duty vehicles. And within MHDVs, a small portion—about 10% of heavy trucks with high utilization—is responsible for approximately 50% of total MHDV emissions. MHDVs are also a major source of criteria pollutant emissions, particularly along busy corridors that are close to disadvantaged communities. These emissions cause increased asthma and lung disease rates among these populations and have been linked to thousands of premature deaths. They also contribute to the inability of some areas to achieve compliance with federal ambient area quality standards, putting residents at disproportionate risk for additional health impacts."

Excluding commercial MHDVs from the eRINs program would also be a missed opportunity to meet U.S. agreements in the Global Commercial Vehicle Drive to Zero MOU,[14] which puts countries on a path to 100% new zero-emission MHDV sales by 2040 at the latest, with an interim goal of at least 30% new sales by 2030.

The fleet-based operating conditions of many electric MHDVs support their inclusion in the eRINs program. Fleet owners and operators have a clear picture of their electricity and vehicle usage across fleets, which could lead to streamlined reporting and reduced administrative burden.

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[12] Executive Order on Strengthening American Leadership in Clean Cars and Trucks (August 5, 2021) https://www.whitehouse.gov/briefing-room/presidential-actions/2021/08/05/executive-order-on-strengthening-american-leadership-in-clean-cars-and-trucks/

[13] The U.S. National Blueprint for Transportation Decarbonization (January 2023) https://www.energy.gov/sites/default/files/2023-01/the-us-national-blueprint-for-transportation-decarbonization.pdf

[14] Memorandum of Understanding on Zero-Emission Medium- and Heavy-Duty Vehicles (2021) https://globaldrivetozero.org/site/wp-content/uploads/2021/12/Global-MOU-ZE-MHDVs-signed-20-Dec-21.pdf

We also encourage the agency to leverage data from its own Clean School Bus grant program and work with fleet owners and operators to develop a MHDV component to the eRINs program.

III. Comments on the Proposed Renewable Volume Obligations (RVOs) for 2024-2025

ZETA believes the proposed cellulosic RVOs for 2024 and 2025 should be raised in the final rule. EV deployment has increased significantly in recent years with 13.2% of new cars sold globally in the first half of 2022 being electric, up from 4.3% in 2020 and 8.7% in 2021.[15] This growth trend is projected to continue with forecasts suggesting 60% of new models will be electric or hybrid by 2026.[16] The final cellulosic RVOs should be raised to account for this growth.

The proposed cellulosic RVOs are well below what the electric vehicle fleet will be able to accommodate. For 2025, the proposed 2,131 million-RIN cellulosic RVO assumes 1,200 million eRINs and therefore 3.4 million EVs.[17,18] This number is significantly lower than EPA's estimates in its draft regulatory impact analysis (DRIA) that project a fleet size of 5.7 million BEVs and 0.97 million PHEVs in 2025.[19] Other analysis suggests even more substantial growth in BEV deployment by 2025 with estimates ranging from 7.8 million to 15 million vehicles on the road.[20,21] Taking the average of these estimates at 11.4 million vehicles suggests doubling the 2025 cellulosic RVO to 4,972 million D3 RINs, made up of 4,041 million eRINs,[22] is more appropriate.[23]

In regards to renewable electricity production, EPA's analysis in the DRIA supports the idea that biogas production will not be a limiting factor stating that "For [2024 and 2025] the demand side of the equation (i.e., the electricity consumed by the electrified vehicle fleet) is a limiting factor

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[15] Zero Emission Vehicle Factbook: A BloombergNEF Special Report for COP 27 (November 2022) https://assets.bbhub.io/professional/sites/24/2022-COP27-ZEV-Transition_Factbook.pdf?utm_source=newsletter&utm_medium=email&utm_campaign=newsletter_axiosgenerate&stream=top

[16] Auto News, Car Wars study (June 30, 2022) https://www.autonews.com/sales/car-wars-study-2026-60-new-models-will-be-ev-hybrid?utm_source=dont-miss&utm_medium=email&utm_campaign=20220630&utm_content=hero-headline

[17] 3,385,417 vehicles * 7,200 mi/vehicle * 0.32 kWh/mi / 6.5 eRINs/kWh = 1,200 million eRINs

[18] As discussed above, a more appropriate eVMT assumption of 12,250 mi/yr means the proposed RVO translates to just 2.0 million EVs on the road in 2025.

[19] EPA Draft Regulatory Impact Analysis (DRIA): RFS Standards for 2023-2025 and Other Changes (November 2022) at 326 https://www.epa.gov/system/files/documents/2022-12/420d22003.pdf

[20] S&P Global, EV Chargers: How many do we need? (Jan. 9, 2023) https://www.spglobal.com/mobility/en/research-analysis/ev-chargers-how-many-do-we-need.html

[21] McKinsey, Building the electric-vehicle charging infrastructure America needs (Apr. 18, 2022) https://www.mckinsey.com/industries/public-and-social-sector/our-insights/building-the-electric-vehicle-Charging-infrastructure-america-needs

[22] 11,400,000 vehicles * 7,200 mi/vehicle * 0.32 kWh/mi / 6.5 eRINs/kWh = 4,041 million eRINs [+ 931 million RINs]

[23] Again, utilizing a more appropriate eVMT value results in a 2025 RVO of 7,806 million D3 RINs, made up of 6,875 million eRINs – nearly a six-fold increase from the proposal.

on the quantity of eRINs which can be generated."[24] In the DRIA, the agency estimates a total potential generation capacity of 58,926 GWH/year would result in 7,297 million eRINs in 2025[25] – a nearly six-fold increase from the proposed 2025 RVO.

Setting robust, achievable cellulosic RVOs will be critical to ensuring eRINs achieve their potential to accelerate transportation electrification and decarbonization. EPA has sent a strong signal to the market by putting forth this eRINs proposal. Especially in the nascent stages of the program, the agency should ensure the standards finalized in this action are not undermined by future actions. We also urge the agency not to undermine demand for eRINs by granting unwarranted small refinery exemptions (SREs) and adhering to its SRE policy announced in June 2022.[26] Any future action undermining the cellulosic RVOs finalized in this rulemaking would unnecessarily hamstring a market that this rule seeks to grow.

Other commenters may argue that the inclusion of eRINs in the RFS will create volatility and uncertainty in the D3 RIN market. ZETA notes that by design, the RFS has built-in compliance flexibilities that enable obligated parties to carry forward a deficit into the following year.[27] Additionally, the percentage-based nature of the standards allows for an automatic adjustment mechanism that ensures the RVOs do not force more renewable fuel into the market than it can tolerate.

IV. Conclusion

ZETA thanks EPA for the opportunity to comment on its notice of proposed rulemaking to set RVOs under the RFS for 2023-2025 and lay out a framework for renewable electricity to generate RINs under the program. The RFS holds great potential to incentivize the entire EV ecosystem and decarbonize the transportation sector. ZETA is committed to working with EPA to help shape the future electric transportation system. We commend EPA for its hard work on this proposal and look forward to continuing the discussion around implementation.

Thank you for your consideration.

[24] DRIA at 330
[25] DRIA at 333
[26] *See* 87 FR 34873 (June 8, 2022)
[27] *See* 40 CFR 80.1427(b)

Appendix A

Using data from the California Air Resources Board to calculate average eVMT. See footnote 10 for data sources and methodology.

3.6 MJ/kWh	2019				2020				2021				2022	
119.53 MJ/gal														
33.20277 kWh/Gal	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Electricity (Onroad residential grid EV charging, gge)	14,112,490	12,387,189	13,722,414	15,357,142	15,430,193	8,803,013	10,981,770	12,182,757	12,434,539	15,637,758	17,451,974	19,182,187	23,609,406	25,862,064
Electricity (Onroad non-residential grid EV charging; LDV/MDV, gge)	437,784	539,082	295,459	320,905	235,013	63,624	138,562	95,603	93,444	114,988	175,059	180,941	184,249	188,379
Electricity (Onroad non-residential low-CI EV charging – LDV/MDV, gge)	1,597,231	1,837,329	2,189,362	2,284,298	1,909,164	1,424,745	1,885,721	1,892,124	2,236,386	3,198,522	3,944,707	4,410,225	4,653,440	6,292,509
Residential EV Charging, MWh	**468,573.87**	**411,289.08**	**455,622.26**	**509,899.77**	**512,325.27**	**292,284.48**	**364,625.27**	**404,501.37**	**412,861.24**	**519,217.00**	**579,454.01**	**636,901.89**	**783,897.86**	**858,692.36**
Total Light-duty EV Charging,MWh	**536,142.02**	**490,192.53**	**538,125.22**	**596,399.75**	**583,517.90**	**341,702.47**	**431,837.09**	**470,499.43**	**490,218.06**	**629,234.74**	**716,241.69**	**789,341.36**	**944,522.57**	**1,073,875.85**
VIO	524,728	526,720	566,519	593,837	624,155	635,435	665,796	703,928	739,831	807,818	887,737	930,536	1,043,932	1,093,150
Residential Charging, kWh/Day	10.04	8.97	8.96	9.55	9.7	5.58	6.48	6.59	6.49	7.36	7.31	7.49	8.24	8.58
Residential Charging, kWh/year	**3,423**				**2,576**				**2,625**				**3,071**	
Check Cell, Row 7 / Row 10 / Days in Quarter (90)	**9.92**	**8.68**	**8.94**	**9.54**	**9.12**	**5.11**	**6.09**	**6.38**	**6.20**	**7.14**	**7.25**	**7.60**	**8.34**	**8.73**
Total EV Charging, kWh/day	11.35	10.34	10.55	11.16	10.39	5.97	7.21	7.43	7.36	8.65	8.96	9.43	10.05	10.92
Total EV Charging, kWh/year	**3,962**				**2,819**				**3,163**				**3,830**	
Miles/yr at 0.32 kWh/mile	**12,382**				**8,809**				**9,884**				**11,970**	