



September 24, 2018

Honorable Chair Mary D. Nichols
Honorable Board Members California Air Resources Board
1001 I Street
P.O. Box 2815
Sacramento, CA 95812

Submitted online to the ict2018 online comment submittal form

Re: Item 18-7-6: Public Hearing to Consider the Proposed Innovative Clean Transit Regulation, a Replacement of the Fleet Rule for Transit Agencies

Dear Chair Nichols and Honorable Board Members:

Southern California Edison (SCE) appreciates the opportunity to comment on the proposed Innovative Clean Transit Rule (ICT).

The Innovative Clean Transit Rule aligns with California's goals of fighting climate change and improving air quality.

SCE is proud to be a long-standing partner with the State of California and customers and communities in our service territory on important climate change and air quality efforts.

The ICT's goal of transitioning 100% of transit fleets to zero-emission bus (ZEB) vehicles by 2040 is an important driver for heavy-duty vehicle electrification state-wide. There are currently 14,600¹ transit buses in the State. Transitioning existing fleets to battery electric buses will provide significant emissions reductions benefits in addressing both air quality and greenhouse gas (GHG) emission reduction goals for 2030.

Electric heavy-duty vehicles are 93 percent cleaner on NOx, and electric trucks and buses emit 40% less GHG emissions than vehicles fueled by bio-methane, or renewable natural gas (RNG)

¹Union of Concerned Scientists, 2018. 10,044 standard 30 to 40 foot buses, with the remaining 4,569 comprised of shuttle (3,182), articulated (1,083), and coach buses (304), <https://blog.ucsusa.org/jimmy-odea/california-gets-one-step-closer-to-zero-emission-transit-buses>

using the statewide average carbon intensity for the grid.^{2,3} The GHG benefits are even higher for battery electric buses charging on SCE's grid, at 57% cleaner than RNG-fueled vehicles.⁴ As SCE's grid continues to get cleaner with even more renewable energy, the GHG benefit of electric buses over RNG-fueled buses grows even wider.

Also, the economics are growing more favorable for electric buses with state funding opportunities and incentives, utility programs for electrical infrastructure needs, and innovative new rate designs that support vehicle electrification.⁵ There are a host of state and federal funding opportunities available for ZEBs.⁶ The Hybrid and Zero-emission Truck and Bus Voucher Incentive Project (HVIP) vouchers with additional amounts if the vehicle operates in a disadvantaged community, for example, can provide the majority of the cost difference

²0.02 grams per brake horsepower-hour (g/bhp-hr) Low-NOx engine compared to in-basin upstream power emissions at 0.001343 g/bhp-hr. Production simulation modeling for in and out-of-basin emissions by SCE resulted in 0.001801 grams per kilowatt hour (g/kWh) of NOx from electric generation in the South Coast Air Basin. At 1.341 horsepower per kWh, emissions from power plants resulting from EV charging would emit an equivalent of 0.001343 g/bhp-hr. The NOx value for electric vehicles in the rest of the state is likely to be even less than the number cited here for South Coast based on prior studies, and probably is conservative given the rest of the state has a lower percentage of in-basin NOx emitting power plants. From SCE's filing with the CPUC in support of 2017 SB 350 Transportation Electrification Proposals, pg.59, [http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/649E8D79409814778825816F0081AB46/\\$FILE/A1701021-SCE-01A-%20Amended%20TE%20Testimony-Full%20Copy.pdf](http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/649E8D79409814778825816F0081AB46/$FILE/A1701021-SCE-01A-%20Amended%20TE%20Testimony-Full%20Copy.pdf)

³ As the December 2017 ICT Discussion Document notes on pg. 9, Low Carbon Fuel Standard Program staff is proposing to increase the energy efficiency ratio (EER) for heavy-duty battery-electric vehicles from 4.2 to 5.0 based on new data for battery electric trucks and buses, <https://arb.ca.gov/msprog/ict/meeting/mt171215/171215ictconcept.pdf>.

Per the final regulation order posted on September 17, 2018 (<https://www.arb.ca.gov/regact/2018/lcfs18/fro.pdf>), the carbon intensity of an electric bus would be valued at 18.75 gCO₂e/MJ. California average grid electricity supplied to electric vehicles: 93.75 gCO₂e/MJ and Energy Economy Ratios (EER) for heavy-duty battery-electric buses: 5.0, 93.75/5.0 = 18.75 gCO₂e/MJ. The claims of a preferable emissions profile of RNG to battery electric vehicles rely on sources other than landfill (wastewater, food/green waste, and dairy). Landfill sources have the highest emissions profile. See pg. 44, in study prepared for Clean Energy Fuels Corp , <http://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A1701020/690/192869841.pdf>. Clean Energy Fuels Corp, the largest provider of natural gas fuel for transportation, recently stated that 100% of the gas sourced in their operations was from landfills with a carbon intensity of 31g CO₂e/MJ. See pgs. 5 and 6, <http://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A1701021/929/196527036.pdf>. SoCalGas's testimony at the CPUC proceeding to approve utility SB 350 Transportation Electrification projects cited a study that showed that electric buses in fact have lower emissions than CNG buses. Additionally, SoCalGas could not determine where the biomethane injected onto its system was sourced. See pg. 8, [http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/C16F7C9A602AEDF9882581FE00079997/\\$FILE/A1701020%20et%20al-SCE%20Reply%20Brief%20on%20the%20Standard%20Review%20TE%20Proposals.pdf](http://www3.sce.com/sscc/law/dis/dbattach5e.nsf/0/C16F7C9A602AEDF9882581FE00079997/$FILE/A1701020%20et%20al-SCE%20Reply%20Brief%20on%20the%20Standard%20Review%20TE%20Proposals.pdf). Emissions values cited for RNG are likely to be even higher as served fuels are mixed between fossil and biomethane sources.

⁴ Based on SCE's CO₂e emissions from delivered electricity in 2016, 66.65 gCO₂e/MJ, pg. A-31, <http://docs.cpuc.ca.gov/PublishedDocs/SupDoc/A1806015/1620/219474631.pdf>.

⁵ These are general conclusions, each transit agency fleet, of course, might find variations based on their unique circumstances.

⁶ ARB, pgs. III-8 – III-16, <https://www.arb.ca.gov/regact/2018/ict2018/isor.pdf>

between a zero-emissions battery electric bus and a gas-powered bus. Utility programs for infrastructure such as those summarized below help to pay for all the costs of installing electrical upgrades to bus depots as well as all of the trenching and cable installation to the chargers. SCE also provides a rebate toward the cost of the qualified charging stations. Innovative new utility rate designs such as our recently approved rates, described below, along with additional revenue from Low Carbon Fuel Standard (LCFS) credits create strong incentives for using electricity as a fuel. Given the support currently offered for switching to electric buses, now is the time to adopt the ICT.

There are currently 37 transit agencies in the state operating battery electric buses or who have a battery electric bus on order, awarded or planned for their fleets.⁷ Twelve transit agencies in the state, comprising small and large fleets representing 37% of the total buses in California have made commitments for zero-emissions fleet targets on an earlier timeframe than proposed by the ICT.⁸ While there is a groundswell of interest in electrifying bus fleets, these transit agency commitments and electric buses currently operating or on order do not represent California's entire fleet. Requiring adoption of 100% zero-emissions fleets across the state would ensure that the benefits of electric buses are delivered statewide to help achieve California's emissions reductions goals and yield the attendant public health benefits.

Despite increasingly favorable comparative economics for battery electric buses, transit agencies may have concerns and questions in transitioning to electrified fleets at scale. There may be gaps in information or awareness about funding opportunities, incentives, or comparative costs or there may be questions or concerns about charging infrastructure, how to manage charging, or other technical, or operational issues. The proposed ICT's requirement for transit agencies to provide ZEB Rollout Plans describing transit agency plans for vehicles purchases, infrastructure build out, financial planning and workforce training can provide a helpful mechanism and framework for agencies to work with partners, such as electrical utilities, to identify and address needs through a methodical planning process.

SCE's efforts can help facilitate and complement the ICT's efforts and ease challenges in implementation. SCE's recently approved programs and rates will help cut costs, while our advisory services can help facilitate in the transition to new technologies by identifying needs and working together with our customers to resolve.

SCE's recent CPUC-approved Medium- and Heavy-Duty (MDHD) charging infrastructure programs help cut costs for customers electrifying fleets.

SCE looks forward to working with customers to pursue feasible, practical, cost-effective approaches to achieving a bold, clean energy future.

⁷ ARB, 2018, <https://arb.ca.gov/msprog/ict/faqs/zbusmap.pdf>

⁸ UCS, 2018, <https://blog.ucsusa.org/jimmy-odea/california-gets-one-step-closer-to-zero-emission-transit-buses>

SCE's recently approved make-ready⁹ MDHD charging infrastructure programs will help in sharing installation and infrastructure costs with transit agency customers to ease the process of installing charging infrastructure.

SCE's January 2017 SB 350 Transportation Electrification application with the CPUC requested funds for programs to contribute to the costs of installing charging stations to help reduce cost barriers for transit agencies interested in electrification as an option.

On January 11, 2018, the Commission approved the first group of priority review pilot projects in the Transportation Electrification application. As part of that suite of programs considered on an expedited schedule, an Electric Transit Bus Make-Ready Program for SCE was approved with approximately \$4,000,000 in funding. From this approved program, Charge Ready Transit was launched on June 4, 2018. SCE is currently reviewing sites and applications from transit agency customers in SCE service territory for this initial approved program.

Also, approved by the CPUC later in the year on May 31, 2018, was a more expansive 5-year MDHD vehicle charging infrastructure program with significant investment and funding of \$356 million to support charging equipment for a minimum of 870 installations, supporting electrification for 8,490 vehicles. The CPUC required a minimum of 15% of the infrastructure budget to serve transit agencies. Transit agencies would receive additional relief with a rebate of up to 50% of the cost of the Electric Vehicle Service Equipment (EVSE). SCE is currently working on program design and requirements for the formal program under this funding, Charge Ready Transport, to launch in 2019.

SCE's recently approved commercial EV rates makes "fueling" with electricity more affordable.

On May 31, 2018, along with approval for the 5 year MDHD program (to be launched as Charge Ready Transport), SCE also received CPUC approval for a new commercial EV rate to reduce costs to commercial fleet customers interested in "fueling" with electricity. The new rate, which transit agencies would be eligible for, would waive demand charges for the first five years and then gradually re-introduce them in a graduated manner over the subsequent five years. The rate would also provide price signals to create opportunities for maximizing savings while charging during low-price periods and to support increased customer utilization (load factor) so that demand charges are more favorable than energy-only electricity charges in the longer term. Pending a decision from SCE's Phase II General Rate Case (GRC) and approval of the filed advice letter for the tariff, SCE anticipates the new commercial EV rates will be available in the first half of 2019.

⁹ "Make-Ready" programs include service connections and electric infrastructure deployed on both the customer and utility sides of the electrical meter, to serve charging stations at participating customer locations, up to and including the stub.

Additional incentives, such as the Low Carbon Fuel Standard (LCFS) credit, can serve as an offset to the costs of fueling with electricity. Revenue generated from LCFS credits can make a big, positive impact. Our internal analysis incorporating CARB-proposed amended values to the LCFS shows a LCFS credit value in 2019 (at \$125 per ton for a credit) for electric buses in SCE's grid of \$0.18/kWh offset in 2019. This amounts to a total of \$14,500 per year per bus (and stays nearly this much per year for 12 years). Our recently approved commercial EV rate structure in 2019 would, pending approval of the filed advice letter for the tariff, be significantly lower around \$.07/kWh to \$.13/kWh for most of the day.¹⁰

While CARB staff, in the LCFS rulemaking staff report, projected \$125 per ton credit prices for the next 12 years, credit prices have been much higher in 2018 (\$173.15 per ton from September 10th to September 16th, 2018).¹¹ If this remains the trend, then the values mentioned in this letter would be nearly 40% higher. There is no cap on the credit amount a transit agency may receive. Because the credit amount is not capped at the actual cost of the fuel, the extra revenue that exceeds the cost of the electricity can be used to cover other expenses or could be used to expand service or lower fares.

SCE provides resources and assistance in helping transit customers electrify bus fleets.

SCE has been supporting and will continue to support transit agencies in electrifying fleets. SCE offers fleet assessments that provide customers with reports of EV options for fleets, associated GHG benefits for going electric, customized rate analyses to help customers understand potential "fuel" cost analysis, along with additional information on utility and non-utility programs and incentives. As part of the fleet assessment, SCE is working on including customers' potential LCFS credit revenues. SCE is also working onsite with customers walking sites to offer an assessment of the feasibility of installing infrastructure to serve potential electric bus fleet deployments.

SCE is also providing customers with information on the upcoming Charge Ready Transport program to help customers align procurement plans with SCE's funding opportunities. On September 14th, SCE hosted a customer forum for Charge Ready Transport to share information about the program and obtain feedback, with 7 transit agencies participating from SCE service territory. By providing consultation on infrastructure needs and siting, rates, charging needs

¹⁰ These are estimates for 2019, pending approval of the filed advice letter for the tariff. Actual rate values are subject to periodic adjustments annually and customer refunds. From 2019-2021, rates would be designed based on the outcome of the 2018 General Rate Case (GRC) Phase 2 proceeding. For 2022 and beyond, the rates would be designed based on the revenue requirement and rate class revenue allocation of the 2021 GRC Phase 2 proceeding which could result in different rate levels. The cycle repeats every 3 years. Demand Charges would be phased back in a graduated manner beginning in 2023.

¹¹ ARB, 2018, https://www.arb.ca.gov/fuels/lcfs/credit/20180916_wklycreditrept.pdf

and optimal siting of required charging infrastructure, SCE stands ready to help support customers' business needs in electrifying fleets.

SCE supports the ICT and stands ready to facilitate the transformation of the transportation sector across all sectors. SCE looks forward to supporting customers through the transition to modes of transportation that align with the shared goal and vision of a sustainable transportation network, with increasing numbers of electric vehicles on the road, improving air quality while cutting greenhouses gases for our region and helping to meet California's goals.

Thank you for considering our comments regarding this important regulation.

Sincerely,



Laura Renger
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Southern California Edison