Date of Hearing: July 12, 2023

ASSEMBLY COMMITTEE ON UTILITIES AND ENERGY
Eduardo Garcia, Chair
SB 233 (Skinner) – As Amended May 18, 2023

SENATE VOTE: 29-9

SUBJECT: Electric vehicles and electric vehicle supply equipment: bidirectional capability

SUMMARY: Requires the California Energy Commission (CEC) to convene a stakeholder working group to make recommendations on the costs and benefits of bidirectional charging and submit a report to the Governor and Legislature by January 1, 2026. Also requires all electric vehicles (EVs) sold in California, with potential exemptions for certain vehicle types as determined by the California Air Resources Board (CARB), to be capable of bidirectional charging beginning with the 2030 model year.

EXISTING LAW:

1) Defines EV grid integration as any method of altering the time, charging level, or location at which grid-connected EVs charge or discharge, in a manner that optimizes plug-in EV interaction with the electrical grid and provides benefits to ratepayers by doing any of the following: increasing electrical grid asset utilization, avoiding otherwise necessary distribution infrastructure upgrades, integrating renewable energy resources, reducing the cost of electricity supply, or offering specified electric reliability services. (Public Utilities Code § 740.16)

2) Requires the California Public Utilities Commission (CPUC) to establish by December 31, 2020, strategies and metrics to maximize the use of vehicle grid integration (VGI) by January 1, 2030. Existing law specifies certain requirements for the strategies, including, but not limited to requiring ratepayer-funded EV integration activities to be in the best interests of ratepayers. (Public Utilities Code § 740.16)

3) Requires electrical corporations to quantify how ratepayer-funded vehicle electrification investments support VGI strategies. Existing law also requires local publicly-owned electric utilities (POUs) to consider EV-grid integration strategies in their integrated resource plans (IRPs) and requires community choice aggregators (CCAs) to report specified information to the CPUC regarding EV-grid integration activities. (Public Utilities Code § 740.16)

4) Requires the CEC to conduct a statewide assessment every two years of EV charging infrastructure needed to support the levels of EV adoption required for the state to meet its goals of putting at least five million zero-emission vehicles (ZEVs) on California roads by 2030, and of reducing emissions of greenhouse gases (GHG) to 40% below 1990 levels by 2030. (Public Resources Code § 25229)

5) Establishes the Clean Transportation Program (CTP) at the CEC to provide grants, loans, and other funding opportunities to develop and deploy innovative fuel and vehicle technologies to support California's climate change policies. (Health and Safety Code § 44272)

6) Establishes the Clean Vehicle Rebate Project (CVRP) under the Air Quality Improvement Program (AQIP) to provide rebates to qualified individuals, businesses, public agencies and entities, and nonprofit organizations for the purchase or lease of eligible ZEVs. (Health and Safety Code § 44274 et. seq.)

7) Establishes, through Executive Order, a goal that 100% of in-state sales of new passenger cars and trucks will be zero-emission by 2035, and that 100% of medium-and heavy-duty vehicles be zero-emission by 2045 for all operations where feasible and by 2035 for drayage trucks. (EO N-79-20)

FISCAL EFFECT: According to the Senate Committee on Appropriations, this bill may impose unknown costs for CARB to revise existing regulations, evaluate vehicle grid integration, certify and enforce vehicle compliance, among other things, as well as potentially significant costs for the CEC to convene a stakeholder working group.

BACKGROUND:

ZEVerything, ZEVerywhere, All At Once? – California's transportation sector is currently the largest source of GHG emissions in the state and, in the interest of meeting the state's emissions reduction targets, California has set a goal that 100% of new passenger vehicle sales will be ZEVs by 2035.[1] ZEV is an umbrella term encompassing battery electric vehicles (BEVs), plug-in hybrid electric vehicles, and hydrogen fuel cell electric vehicles. Meeting the state's ZEV goals will require a significant increase in the number of light-, medium-, and heavy-duty ZEVs on the road and a drastic increase in the infrastructure to support these vehicles. Cumulative sales of ZEVs in California recently reached 1.5 million, with ZEVs accounting for around 20% of new car sales in California in 2022. California accounted for 40% of overall ZEV sales nationwide in 2022.[2,3]

Both Sides Now – Bidirectional charging is a process by which a BEV works with a specified charger to cycle the BEV's battery and use its current to power devices in a home, building, or elsewhere. The most straightforward manifestation of bidirectional charging is known as vehicle to home (V2H), in that it requires only the vehicle and charger to be bidirectionally capable. The batteries powering BEVs have substantial energy storage capacity, typically 60 kilowatt-hours (kWh) or more. The average daily home usage is about 20 kWh, meaning that a fully charged BEV could theoretically power a typical home for three days should the home's electricity service be disrupted.[4]

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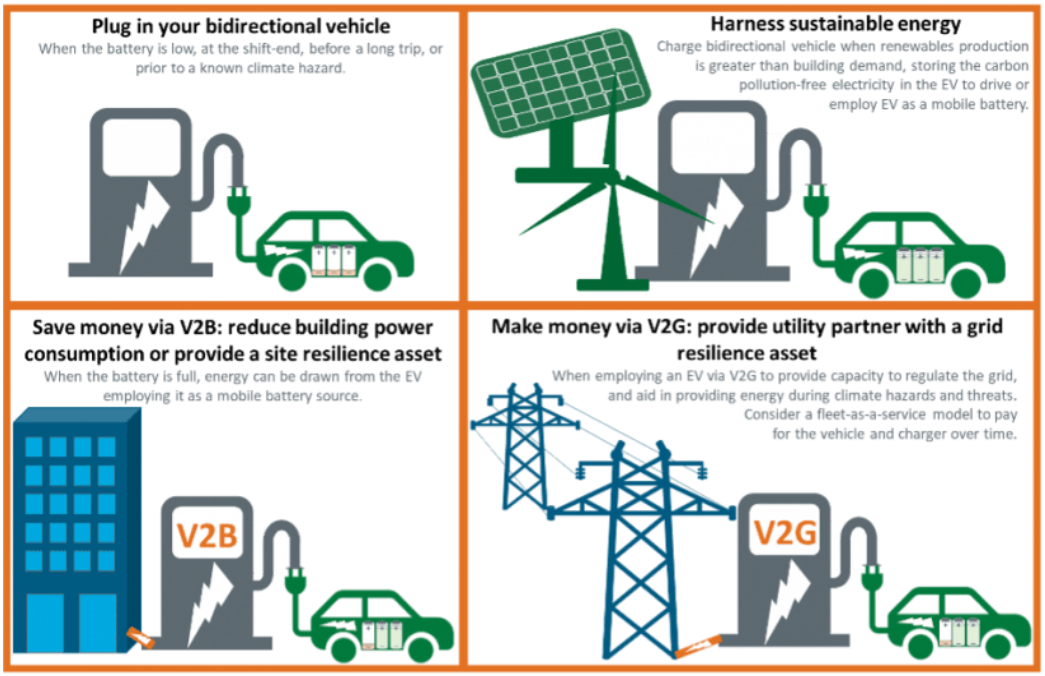
[1] Executive Order N-79-20
[2] Office of Governor Gavin Newsom; "California Surpasses 1.5 Million ZEVs Goal Two Years Ahead of Schedule"; April 2023; https://www.gov.ca.gov/2023/04/21/california-surpasses-1-5-million-zevs-goal-two-years-ahead-of-schedule/
[3] Reuters; "California accounted for 40% of U.S. zero-emission vehicle sales in 2022"; January 2023; https://www.reuters.com/business/autos-transportation/california-accounted-40-us-zero-emission-vehicle-sales-2022-2023-01-23/
[4] The Washington Post; "Electric vehicles can now power your home for three days"; February 2023; https://www.washingtonpost.com/climate-environment/2023/02/07/ev-battery-power-your-home/

Alternatively, bidirectional charging may be used for pricing arbitrage, either through V2H or through a more complicated process known as vehicle to grid (V2G). In V2H, electricity is drawn from the BEV's battery during times of peak demand (such as 4-9 p.m.), when electricity rates are at their highest, to reduce the amount of electricity otherwise being drawn from the grid. The BEV battery may then be recharged at a time of lower demand and correspondingly lower electricity rates. Such BEV usage may be viewed as load reduction or demand response, and would likely correspond to lower energy bills for customers. In V2G, BEVs not only reduce local energy usage but actually send electricity back to the grid, netting the BEV owner a profit.[5] Widespread engagement in V2G is theorized to increase grid reliability by supplementing existing energy generation during periods of peak load as well as reduce the need for certain generation resources, particularly "peaker" natural gas plants.[6]

V2H and V2G fall under the umbrella of vehicle grid integration (VGI), which has the potential for ratepayer savings, improved grid reliability, and a financial return to BEV owners.[7] As shown in Figure 1, VGI includes a range of strategies, rate designs, and technologies aimed at helping BEV owners optimize their charging behavior to increase the reliability of electric supply, avoid certain costs to the electric system, and help owners charge when electricity rates provide the best value.[8]

Figure 1 – The Process and Potential Benefits of Bidirectional Changing.[9]



[5] U.S. Department of Energy; "Bidirectional Charging and Electric Vehicles for Mobile Storage"; https://www.energy.gov/femp/bidirectional-charging-and-electric-vehicles-mobile-storage
[6] Fast Company; "How California is looking to use EVs as a solution for blackouts"; May 2023; https://www.fastcompany.com/90892534/california-bill-evs-solution-blackouts-bidirectional-charging
[7] U.S. Department of Energy; "Bidirectional Charging and Electric Vehicles for Mobile Storage"; https://www.energy.gov/femp/bidirectional-charging-and-electric-vehicles-mobile-storage
[8] CEC; "Vehicle-Grid Integration Program"; https://www.energy.ca.gov/programs-and-topics/programs/vehicle-grid-integration-program
[9] U.S. Department of Energy; "Bidirectional Charging and Electric Vehicles for Mobile Storage"; https://www.energy.gov/femp/bidirectional-charging-and-electric-vehicles-mobile-storage

In 2019, the CPUC, CEC, CARB, the California Independent System Operator (CAISO) and a variety of stakeholders jointly launched the VGI Working Group.[10] The group was tasked with assessing the potential benefits of VGI, weighing those benefits against alternative methods of meeting energy demand, identifying policies which would realize those potential benefits, and reporting the results. The working group evaluated 320 different VGI use cases spanning multiple sectors (residential, commercial, rideshare, and fleets), applications, and types of charging across vehicle types, and found widely varying benefits across use cases. The final report admitted to limitations in fully assessing barriers to VGI, including customer interest and acceptance, suggesting that further study may be necessary. The working group developed a set of 92 individual recommendations for policy actions that state agencies, investor-owned utilities (IOUs), community choice aggregators (CCAs), and CAISO could undertake to advance VGI in the short-term (2020-22), medium-term (2023-2025), and long-term (2026-2030).[11]

A number of electric utilities, including California's three largest IOUs (Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric), have adopted specialized rates for BEV owners to help incentivize BEV charging during off-peak demand periods. Pursuant to SB 676 (Bradford, Chapter 484, Statutes of 2019), a number of electric utilities have undertaken VGI pilot projects to deploy options for optimizing BEV charging with grid needs.[12]

Test Drives – The potential benefits of integrating BEVs with the electric grid are substantial. In 2020, the CPUC issued a decision adopting strategies and metrics to further the integration of EVs as electric grid resources. As part of that decision the CPUC authorized electric utilities to propose pilot projects that use EVs in a demand response capacity to shift or curtail load, explore managed charging, and examine the various use cases of V2G, with a focus on aspects of VGI that are technically feasible but not yet commercially available.[13] Numerous pilot projects are underway throughout California – PG&E alone has 14 – with others soon to launch and still others pending CPUC approval.

As an example, in May 2022, PG&E announced the creation of three pilot projects to test bidirectional charging in homes, businesses and with local microgrids in select high fire-threat areas.[14,15] These pilots are intended to test a BEVs' ability to send power back to the grid and provide backup power during an outage. However, while a number of California electric utilities are testing the capabilities of bidirectional charging through pilot studies, these programs are not mandatory and do not force customers to invest in bidirectional technology. Importantly, the

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[10] CPUC; "VGI Policy, Pilots, and Technology Enablement"; https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/infrastructure/transportation-electrification/vehicle-grid-integration-activities
[11] CPUC; "Final Report of the California Joint Agencies Vehicle-Grid Integration Working Group"; June 2020
[12] Tech Brew; "California's vehicle-to-grid experiments offer a glimpse of the future"; March 2022; https://www.emergingtechbrew.com/stories/2022/03/18/california-s-vehicle-to-grid-experiments-offer-a-glimpse-of-the-future
[13] D. 20-12-029
[14] CPUC; "CPUC Supports Transportation Electrification With Approval of PG&E Vehicle-Grid Integration Pilot Programs"; https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-supports-transportation-electrification-with-approval-of-pge-vgi-pilots
[15] PV Magazine; "PG&E $11 million pilot programs to accelerate vehicle-to-everything technologies"; May 2022; https://pv-magazine-usa.com/2022/05/09/pge-11-million-pilot-programs-to-accelerate-vehicle-to-everything-technologies/

bidirectional charging technology necessary to conduct these pilots is largely paid for by the utilities through financial incentives for customer participation.[16,17]

California's three largest investor-owned utilities (IOUs), the Sacramento Municipal Utility District (SMUD), the Los Angeles Department of Water and Power (LADWP) and Lancaster Energy have entered into a memorandum of understanding led by the federal Department of Energy to collaborate with other partners to identify barriers and opportunities for bidirectional charging.[18]

Short Circuit – There are significant barriers to the effective, widespread implementation of bidirectional charging related to the capabilities of the vehicles themselves, BEV charging equipment, and the electric grid. On the vehicle side, there are multiple BEVs available with bidirectional charging capability and manufacturers have announced plans to add bidirectional capability to a wider variety of models in the coming years.[19,20] A bidirectional charging impact analysis conducted by staff at the Hawai'i Natural Energy Institute suggests that consistent bidirectional cycling of a BEV battery can be detrimental to battery performance of the vehicle and can substantially shorten the lifespan of a BEV battery.[21] Additionally, researchers from the Rocky Mountain Institute have indicated that more demonstrations are needed and that many of the grid-level benefits from VGI can be obtained without bidirectional charging.[22]

In terms of charging equipment, only a small portion of those available are bidirectional and, to the knowledge of this committee, no publicly available level 2 (240V) or direct current (DC) fast chargers in the state possess bidirectional capability. Ford recently introduced a bidirectional charger to pair with its F-150 Lightning electric pickup truck. However, the charger retails for $1,310, substantially more than the $550 price for Tesla's non-bidirectional charger.[23] Bidirectional BEV charging equipment will likely drop in price over time with further development and scaling, but presently bidirectional chargers are significantly more expensive than traditional chargers technologies.[24]

For the electric grid, challenges persist with electricity from BEVs going onto the grid, similar to the complexities of converting a one-way street to accommodate two-way traffic. Homes will likely require upgrades to electric panels to safely accept and manage power supplied from the

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[16] PG&E; "Vehicle to Everything pilot programs"; https://www.pge.com/en_US/residential/solar-and-vehicles/options/clean-vehicles/vgi/v2x-pilots.page
[17] SDG&E; "Power Your Drive for Fleets"; https://www.sdge.com/business/electric-vehicles/power-your-drive-for-fleets
[18] SMUD; "California Utilities Join to Support Regional Electric Vehicle Charging Network"; January 2022; https://www.smud.org/en/Corporate/About-us/News-and-Media/2022/2022/California-Utilities-Join-to-Support-Regional-Electric-Vehicle--Charging-Network
[19] Make Use Of; "10 Electric Vehicles Available With Bidirectional Charging Capabilities"; June 2023; https://www.makeuseof.com/electric-vehicles-bidirectional-charging/
[20] Electrek; "Tesla says it could have bidirectional charging in two years, but will it?"; March 2023; https://electrek.co/2023/03/01/tesla-says-it-could-have-bidirectional-charging-in-two-years-but-will-it/
[21] Green Car Congress; "Hawaii study finds vehicle-to-grid discharge detrimental to EV batteries"; May 2017; https://www.greencarcongress.com/2017/05/20170515-v2g.html
[22] Rocky Mountain Institute; "Electric Vehicles As Distributed Energy Resources"; June 2016.
[23] Electrek; "Ford launches its bi-directional home charging station at a surprisingly good price"; March 2022; https://electrek.co/2022/03/01/ford-launches-bi-directional-home-charging-station-surprisingly-good-price/
[24] Clean Energy Reviews; "Bidirectional Chargers Explained - V2G Vs V2H Vs V2L"; June 2023; https://www.cleanenergyreviews.info/blog/bidirectional-ev-charging-v2g-v2h-v2l

BEV to the wall outlet. The electric distribution grid must be capable of transferring electricity, which may be greater than or from a different direction than the grid is designed to handle. There are safety concerns for electrical workers, who need to know in which direction electricity is flowing to effectively isolate circuits and ensure safety during maintenance.[25,26]

COMMENTS:

1) *Author's Statement.* According to the author, "There are plenty of good reasons to rely on EVs for more than transportation. SB 233 will ensure that new EVs are equipped with bidirectional charging so that EV batteries have the ability to power homes or other facilities when electricity demand is at its peak and prices are high. With bidirectional charging, EVs also have the potential to help power the grid. SB 233 will also help slash energy bills for EV owners and give California the opportunity to harness EVs as mini-power plants on wheels."

2) *Proposed Amendments.* As currently drafted, this bill includes a mandate for all BEVs—light-, medium-, and heavy-duty—sold in California beginning with the 2030 model year to be capable of bidirectional charging, with potential exemptions for certain vehicle types as determined by CARB. *Proposed amendments from the Assembly Committee on Transportation seek to exclude medium- and heavy-duty vehicles from this bill's bidirectional capability mandate. The author accepted these amendments when the bill was before the Transportation Committee, however, due to the tight legislative timeline, these amendments are proposed to be adopted in our hearing to facilitate this bill being heard.*

3) *If You Build It, They Will Charge.* This bill, even with the Assembly Committee on Transportation amendments, creates a new mandate for all light-duty BEVs sold in the state beginning with model year 2030 vehicles to be bidirectional. The effectiveness of such a mandate on just the vehicles without (1) requirements for corresponding capability in the charging equipment or (2) consideration of necessary distribution grid upgrades required to safely and effectively implement V2G is uncertain. Supporters of the bill assert that bidirectional capability is less costly to install in vehicles than the associated charging or grid infrastructure upgrades and, to eventually move toward the widespread implementation of V2H and V2G, that makes the vehicles a logical place to start. While the substantial cost of bidirectional charging equipment has been documented,[27,28] the cost to consumers of mandating bidirectional charging capability for vehicles remains unclear.[29,30] Implicit in this assertion is the assumption that once a large proportion of

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[25] Kempton *et. al*; "Vehicle-to-Grid Power: Battery, Hybrid, and Fuel Cell Vehicles as Resources for Distributed Electric Power in California"; June 2001.
[26] Idaho National Laboratory; "Vehicle-to-Grid (V2G) Power Flow Regulations and Building Codes Review by the AVTA"; September 2012.
[27] Clean Energy Reviews; "Bidirectional Chargers Explained - V2G Vs V2H Vs V2L"; June 2023; https://www.cleanenergyreviews.info/blog/bidirectional-ev-charging-v2g-v2h-v2l
[28] Motortrend; "For Us, It'll Cost $18K to Power a House With Our Ford F-150 Lightning"; January 2023; https://www.motortrend.com/reviews/2022-ford-f-150-lightning-yearlong-review-update-1-sunrun-backup-power/
[29] GreenBiz; "Is bidirectional charging becoming more accessible?"; November 2022; https://www.greenbiz.com/article/bidirectional-charging-becoming-more-accessible
[30] Canary Media; "A California bill could help EVs prevent blackouts"; May 2023; https://www.canarymedia.com/articles/ev-charging/a-california-bill-could-help-evs-prevent-blackouts

BEVs in California have bidirectional capability, BEV charging equipment manufacturers and utilities will be strongly incentivized to make whatever changes necessary to take advantage of this new resource. This would be an "if you build it, they will come" approach to a multi-step process with a wide variety of stakeholders, markets, and regulators, many of which would be required to consider the financial impacts, environmental benefits, resource allocations, and safety of bidirectional charging, among other factors. Such a diverse group may also weigh these factors differently. While a mandate for bidirectional capability in vehicles may spur the accelerated deployment of bidirectional capable charging equipment and the necessary support infrastructure, that outcome is far from certain; and in the meantime would likely increase vehicle costs while adding little benefit until the necessary equipment and grid upgrades arrive.

4) *Defined Timelines.* The timeline specified in the bill, with bidirectional capability mandated for all vehicles by model year 2030, has raised concerns among stakeholders. The design process for vehicles of a given model year begins years in advance, meaning that, under this bill, manufacturers would need to begin development and design for bidirectional capable vehicles long before 2030. CARB is empowered in the bill to designate specific exceptions to the mandate based on their assessment of the benefits of vehicle type-specific use cases being beneficial for grid resilience. Though CARB is given the authority to update the definition used to exempt certain vehicle types from the mandate, there is a requirement that the exemption be clarified by the end of 2026. This could put vehicle manufacturers in limbo, as they may need to prepare as if the vehicles will be required to have bidirectional capability in their regular development and design timeline for model year 2030 prior to the announcement of which vehicle types will be exempted from the mandate.

5) *Opportunity Cost.* The mandate for all new EVs sold in California to be bidirectional capable by 2030 has raised concerns from a wide variety of stakeholders. These concerns relate to cost, utility, and timing. Questions have been raised as to whether mandating bidirectional capability would increase the cost of producing BEVs, which would inevitably be passed on to consumers. The cost directly associated with incorporating bidirectional capability, from the information this committee has gathered, would likely raise the price of a BEV by a few hundred dollars. However, indirect cost impacts may also arise. For example, CARB's Advanced Clear Cars II regulations require that BEVs maintain at least 80% of electric range for 10 years or 150,000 miles by model year 2030.[31] These regulations set a baseline for BEV battery longevity but assume that the only wear on the battery will be from driving, which is reflected in the mileage requirement. If an EV was regularly being used for V2H or V2G, the additional use may degrade the battery in a way that would not be reflected in mileage. As a result, a battery which would have lasted for 150,000 miles if it were only being used for driving may not reach that mileage threshold, which would leave the manufacturer out of compliance with CARB regulations. Manufacturers would need to increase the capacity of BEV batteries to maintain mileage-based compliance, which would increase the price of BEVs. Alternatively, if California were to require bidirectional charging capability and other states and countries did not follow suit, this may have an islanding effect on the California EV market, analogous to that of the market for California's unique CARB

[31] CARB; "California moves to accelerate to 100% new zero-emission vehicle sales by 2035"; August 2022.

reformulated gasoline blend; if only a subset of EVs manufactured met the bidirectional mandate in the California market, the limited supply might increase volatility in price and/or availability in California's EV market. Any significant increase in EV prices will disincentivize customers from buying EVs, potentially slowing the pace of EV adoption in California when rapid EV deployment is central to achieving California's emission reduction goals.

6) *Charge-22*. The potential for a mandate on bidirectional capability to raise the price of BEVs also introduces an equity issue in which any increase in price may disproportionately dissuade lower-income BEV buyers relative to higher-income buyers. One of potential benefits of the V2G process of bidirectional charging is that it can provide financial benefit to the BEV owner, should the BEV be effectively integrated into the grid and an effective reimbursement framework is established for the power sent back to the grid. This financial benefit could be particularly relevant to a low-income household and may over time outweigh the marginal additional cost of adding bidirectional capability to the vehicle. However, this is highly assumptive that such a reimbursement scenario—i.e., a utility tariff—would be structured in such a way as to appropriately incentivize V2G and not lead to cost-shifts amongst customer classes or non-adopters, as has often been discussed in the rooftop solar market.

   In addition to a bidirectionally capable BEV, this scenario also necessitates a bidirectional capable charging station, which is a substantial cost burden, and sufficient grid infrastructure upgrades to enable the grid integration of the vehicle. Those grid upgrades would likely be borne by all utility ratepayers, further exacerbating costs between early adopters and non-adopters of this equipment. While the potential benefits of bidirectional capability via V2G could be most impactful for low-income EV buyers, they would also experience the increased upfront costs most acutely – perhaps to the point of precluding the purchase of an EV altogether. *As such, the author and committee may wish to consider amendments to specify that the report called for under this bill should specifically consider the potential impacts of requiring bidirectional capability for various vehicle types on the equitable achievement of the state's zero-emission vehicle goals.*

7) *V to What?* The different end uses for the electricity derived from bidirectional capacity (V2H, V2B, and V2G) are grouped in the bill and almost treated synonymously, but would have significantly different requirements to functionally implement. The major requirement to enable V2H would be purchasing a bidirectional capable charger, while effectively implementing V2G could require extensive infrastructure upgrades and regulatory action to set parameters for the routing of, as well as reimbursement for, the electricity. *As such, the author and committee may wish to consider amendments to specify aspects of the report related to cost impacts and the resources required from the electricity sector to implement these various modes of bidirectional charging.*

8) *Related Legislation.*

   SB 493 (Min), would require the CEC to assess the energy resources, including hydrogen fuel production, storage, and transport, as well as electricity generation and infrastructure, needed to meet state goals to transition medium and heavy-duty vehicles to ZEVs, as well

as require CARB to use the CEC's assessment to create a strategic plan to achieve this transition. Status: *set for hearing* in this committee on July 12, 2023.

9) *Prior Legislation.*

SB 676 (Bradford) required the CPUC to establish EV-grid integration strategies for certain load-serving entities. The bill also required POUs to consider EV-grid integration strategies in their IRPs and required CCAs to report specified information to the CPUC regarding EV-grid integration activities. Status: Chapter 484, Statutes of 2019.

SB 1000 (Lara) required the CEC to evaluate the extent to which charging infrastructure is proportionately deployed and use funds to more proportionately deploy chargers as needed. The bill also required the CPUC to explore facilitating the development of technologies that promote grid integration and adopting a tariff for heavy-duty EVs that encourages charging during periods of excess grid capacity. Status: Chapter 368, Statutes of 2018.

AB 2127 (Ting) required the CEC to conduct a statewide assessment of vehicle charging infrastructure needed to support the state's ZEV deployment goals. Status: Chapter 365, Statutes of 2018.

10) *Double Referral.* This bill was previously heard in the Assembly Committee on Transportation on July 5, 2023, where it passed with a 9-4-2 vote.

REGISTERED SUPPORT / OPPOSITION:

Support

Nuvve (co-sponsor)
The Climate Center (co-sponsor)
Union of Concerned Scientists (co-sponsor)
1000 Grandmothers for Future Generations
350 Bay Area
350 Bay Area Action
350 Conejo
350 Humboldt
350 Humboldt: Grass Roots Climate Action
350 South Bay LA
350 Southland Legislative Alliance
350 Ventura County Climate Hub
52nd District
Active San Gabriel Valley
Adopt a Charger
Alameda County Democratic Party
All Rise Alameda
Alliance of Nurses for Healthy Environments
Better World Group; the
Building the Base Face to Face

Cahdemo Association
California Business Alliance for A Clean Economy
California Climate Voters
California Environmental Voters
California Environmental Voters (formerly Clcv)
California Interfaith Power & Light
California Native Plant Society, Alta Peak Chapter
California Nurses for Environmental Health and Justice
California Religious Action Center of Reform Judaism
Center for Biological Diversity
Center for Community Action & Environmental Justice
Center for Community Action and Environmental Justice
Center for Community Energy
Center for Environmental Health
Central California Asthma Collaborative
Central Coast Climate Justice Network
Chademo Association
Change Begins With Me (INDIVISIBLE)
Citizens Climate Lobby
City of Berkeley
City of Del Mar
City of Port Hueneme
City of West Hollywood
Civicwell
Clean Coalition, the
Clean Coaliton
Clean Power Campaign
Cleanearth4kids.org
Cleantech San Diego
Climate Action California
Climate Center; the
Climate Equity Policy Center
Climate Health Now
Climate Reality Project - Silicon Valley Chapter
Climate Reality Project, Los Angeles Chapter
Climate Reality Project, San Fernando Valley
Climate Reality San Fernando Valley, CA Chapter
Climate Resolve
Cloverdale Indivisible
Coalition for Clean Air
Community Environmental Council
Contra Costa Moveon
Cool Davis
Courage California
Dcbel
Defending Our Future: Indivisible in Ca
Delores Huerta Foundation
Democrats of Rossmoor
Dolores Huerta Foundation

East Valley Indivisibles
El Cerrito Progressives
Elders Climate Action, Norcal and Socal Chapters
Electrify Now
Endangered Habitats League
Environment California
Environmental Working Group
Ev-seg
Feminists in Action (formerly Indivisible CA 34 Womens)
Feminists in Action Los Angeles
Fierce Courage Consulting
Fossil Free California
Friends Committee on Legislation of California
Friends of The Eel River
Glendale Environmental Coalition
Green Latinos
Greenlatinos
Greenpeace USA
Grid Alternatives
High Noon Advisors
Hillcrest Indivisible
Human Impact Partners
Indi Squared
Indian Valley Indivisibles
Indivisible 30/keep Sherman Accountable
Indivisible 36
Indivisible 41
Indivisible Auburn CA
Indivisible Beach Cities
Indivisible CA Statestrong
Indivisible Ca-25 Simi Valley-porter Ranch
Indivisible Ca-29
Indivisible Ca-3
Indivisible Ca-37
Indivisible Ca-39
Indivisible Ca-43
Indivisible Ca-7
Indivisible Ca: Statestrong
Indivisible Claremont/inland Valley
Indivisible Colusa County
Indivisible East Bay
Indivisible El Dorado Hills
Indivisible Elmwood
Indivisible Euclid
Indivisible Lorin
Indivisible Los Angeles
Indivisible Manteca
Indivisible Marin
Indivisible Media City Burbank

Indivisible Mendocino
Indivisible Normal Heights
Indivisible North Oakland Resistance
Indivisible North San Diego County
Indivisible Oc 46
Indivisible Oc 48
Indivisible Petaluma
Indivisible Sacramento
Indivisible San Bernardino
Indivisible San Jose
Indivisible San Pedro
Indivisible Santa Barbara
Indivisible Santa Cruz County
Indivisible Sausalito
Indivisible Sebastopol
Indivisible Sf
Indivisible Sf Peninsula and Ca-14
Indivisible Sonoma County
Indivisible South Bay LA
Indivisible Stanislaus
Indivisible Suffragists
Indivisible Ventura
Indivisible Westside L.a.
Indivisible Windsor
Indivisible Yolo
Indivisible: San Diego Central
Indivisibles of Sherman Oaks
Joint Venture Silicon Valley
Kaluza
Klm Consulting
Leap
Legacy Solutions
Let's Green Ca!
Livermore Indivisible
Local Clean Energy Alliance
Long Beach Alliance for Clean Energy
Los Angeles Business Council
Los Angeles Regional Collaborative for Climate Action and Sustainability
Lutheran Office of Public Policy - California
Marin Clean Energy (MCE)
Mill Valley Community Action Network
Morongo Basin Conservation Association
Mountain Progressives
Move LA
North Bay Electric Auto Association
Nothing Rhymes With Orange
Occidental Arts and Ecology Center
Orchard City Indivisible
Orinda Progressive Action Alliance

Our Revolution Long Beach
Peninsula Interfaith Climate Action
Plug in America
Queers 4 Climate
Recolte Energy
Redwood Coalition for Climate and Environmental Responsibility
Restore the Delta
Riseup
Rising Sun Center for Opportunity
Romero Institute
Rooted in Resistance
Ross Valley Indivisible
Sacramento Electric Vehicle Association
San Diego Indivisible Downtown
San Francisco Bay Physicians for Social Responsibility
Santa Barbara Standing Rock Coalition
Santa Cruz Climate Action Network
Sfv Indivisible
Sierra Club
Sierra Club California
Silicon Valley Youth Climate Action
Stand.earth
Sunflower Alliance
Sunpower Corporation
Sustainable Claremont
Sustainable Rossmoor
Synergistic Solutions
Tehama Indivisible
Terraverde Energy
The Climate Council
The Phoenix Group
The Resistance Northridge-indivisible
Together We Will Contra Costa
Tww/indivisible - Los Gatos
Vallejo-benicia Indivisible
Venice Resistance
Voices for Progress
Vote Solar
Women's Alliance Los Angeles
World Business Academy
Yalla Indivisible
Yolo Interfaith Alliance for Climate Justice

Opposition

Alliance for Automotive Innovation
Calchamber
California Electric Transportation Coalition
California Trucking Association

Calstart
Chargepoint, INC
Silicon Valley Leadership Group

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