

Senate Budget and Fiscal Review—Nancy Skinner, Chair

SUBCOMMITTEE NO. 2

Agenda

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Senator Brian Dahle

Senator Mike McGuire

Senator Henry I. Stern



Wednesday, March 2, 2022

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State Capitol - Room 4203

Consultant: James Hacker

ITEMS FOR DISCUSSION

8660 California Public Utilities Commission.....	3
Issue 1: Update on Net Energy Metering 3.0	3
3360 California Energy Resources Conservation and Development Commission	5
3900 California Air Resources Board	5
Issue 2: Zero Emission Vehicle Package	5
0540 California Natural Resources Agency.....	15
0650 Governor’s Office of Planning and Research.....	15
3360 California Energy Resources Conservation and Development Commission	15
3560 State Lands Commission	15
3860 Department of Water Resources	15
3900 California Air Resources Board	15
8660 California Public Utilities Commission.....	15
Issue 3: Clean Energy Investments	15
8660 California Public Utilities Commission.....	25
Issue 4: ALJ Division Management and Proceeding Support.....	25

Issue 5: Authorization for Permanent Funding of Key Limited-Term Positions in Support of Energy Policy Statutes 27

Issue 6: Communications Licensing and Compliance Section Permanent Position Authority. 29

Issue 7: Information Technology Services Division—Security Enhancements 30

Issue 8: Physical and Cyber Security Section 31

Issue 9: Strengthen Internal Operations Core 32

Issue 10: Transportation Licensing and Enforcement Branch 34

Issue 11: Utility Audit Requirements..... 36

Public Comment

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ITEMS FOR DISCUSSION

8660 CALIFORNIA PUBLIC UTILITIES COMMISSION

Issue 1: Update on Net Energy Metering 3.0

Background. Customers who install behind-the-meter (BTM) small solar, wind, biogas, and fuel cell generation facilities to serve all or a portion of onsite electricity needs are eligible to participate in net-energy metering (NEM) tariff programs offered within electric investor-owned utility (IOUs) territories. Customers participating in a NEM tariff programs allows them to generate their own power to serve their needs directly onsite and to receive a financial credit on their electric bills for any power fed back until the electric utility system. NEM tariff programs also provide other types of financial compensation such as exemptions from certain fees and surcharges.

The current NEM program (NEM 2.0), was adopted by the CPUC in Decision (D.)16-01-044 on January 28, 2016, and is available to customers receiving electric service in PG&E, SCE and SDG&E territories. The program went into effect in SDG&E's service territory on June 29, 2016, in PG&E's service territory on December 15, 2016, and in SCE's service territory on July 1, 2017. Currently, the program provides customer-generators full retail rate credits for power exported to the grid and requires them to pay a few charges that align NEM customer costs more closely with non-NEM customer costs. Any customer-generator applying for NEM pay a one-time interconnection fee, pay non-bypassable charges on power provided through the electric utility system, and they must take service on a time-of-use (TOU) electric rate.

The LAO notes that the vast majority of BTM solar customers are enrolled in NEM. Some version of NEM has been in place since 1996, but has been modified several times since then. Under NEM, the utility effectively pays solar customers (through a bill credit) for the power they generate and exported back to the grid. Under NEM 2.0, the customer receives the full retail rate for exported power, which includes costs associated with electric generation, transmission, and distribution. For example, if a customer consumes 100 kwh of electricity from the electric utility system, but exports 70 kilowatt hours of power from their solar system back to through the electric utility system, then the customer would pay the retail rate for 30 kwh of electricity. Under NEM 2.0, much of the basic structure described above remains in place. Some of the key changes included charging new NEM customers a one-time interconnection fee and a requirement that new NEM 2.0 residential customers take service on a TOU electric rate. TOU is a rate plan in which rates vary according to the time of day and season. Higher rates are charged during typical high demand hours and lower rates are charged during low demand hours.

Recent Actions.

The Commission committed in Decision (D.) 16-01-044 to later review the NEM successor (or NEM 2.0) tariff, citing interactive and unresolved policy movements within the Commission but outside the scope of the existing proceeding. Accordingly, the Commission adopted an Order Instituting Rulemaking on August 27, 2020, to revisit the existing NEM tariff.

The major focus of this proceeding has been on the development of a successor to the existing NEM 2.0 tariff pursuant to the requirements of AB 327 (Perea), Chapter 611, Statutes of 2013. The proceeding's scope also includes the review and potential modification of all NEM tariff schedules, and issues related to consumer protection.

The Commission issued a Proposed Decision on December 13, 2021, recommending the creation of a net-billing tariff that would succeed the existing tariff. The Proposed Decision stated that NEM must be modernized to incentivize customers to install energy storage paired with BTM solar to help California meet its net-peak demand (i.e., peak demand minus large-scale wind and solar output) and ensure electric service reliability. Overall, the Proposed Decision modifies the compensation structure under the NEM tariff and includes a bill credit for Net Billing customers to ensure customers can pay for a solar plus storage energy system in 10 years or less through electric bill savings.

Next Steps. The Proposed Decision was originally scheduled to heard on January 27, 2022 at a CPUC Voting Meeting. However, after robust public engagement, the vote on the Proposed Decision was delayed. The CPUC has yet to set a subsequent date to decide on the Proposed Decision, or to issue modifications to the Proposed Decision.

Staff Recommendation: Informational Only.

**3360 CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION
3900 CALIFORNIA AIR RESOURCES BOARD****Issue 2: Zero Emission Vehicle Package**

Governor’s Budget. The budget includes \$6.1 billion (\$3.5 billion General Fund, \$1.5 billion from Proposition 98, \$676 million Greenhouse Gas Reduction Fund, and \$383 million Federal Funds) over five years for additional investments in zero emission vehicles. This is on top of the 2021 Budget Act commitment of \$3.9 billion towards ZEV acceleration through 2023-24. This brings the total investment to \$10 billion over six years. These additional investments include:

- **Low-Income Zero-Emission Vehicles and Infrastructure:** \$256 million for low-income consumer purchases, and \$900 million to expand affordable and convenient ZEV infrastructure access in low-income neighborhoods. These investments will focus on planning and deploying a range of charging options to support communities, including grid-friendly high-power fast chargers and at-home charging.
- **Heavy-Duty Zero-Emission Vehicles and Supporting Infrastructure:** \$935 million to add 1,000 zero-emission short-haul (drayage) trucks and 1,700 zero-emission transit buses; \$1.5 billion Proposition 98 to support school transportation programs, including advancing electric school buses in a coordinated effort between educational, air pollution, and energy agencies; \$1.1 billion for zero-emission trucks, buses, and off-road equipment and fueling infrastructure; and \$400 million to enable port electrification.
- **Zero-Emission Mobility:** \$419 million to support sustainable community-based transportation equity projects that increase access to zero-emission mobility in low-income communities. This includes supporting clean mobility options, sustainable transportation and equity projects, and plans that have already been developed by communities that address mobility. These locally driven projects continue to be a direct response to critical mobility needs identified by community-based organizations and residents working on the front lines to lift up priority populations.
- **Emerging Opportunities:** \$200 million to invest in demonstration and pilot projects in high carbon-emitting sectors, such as maritime, aviation, rail, and other off-road applications, as well as support for vehicle grid integration at scale. These investments will help maintain California’s role as the hub of ZEV market creation and innovation, creating economic development opportunities, while accelerating zero-emission solutions in hardest-to-reach segments of the transportation system.

These investments, including those appropriated in the 2021-22 budget, are summarized below.

General Fund, Unless Noted Otherwise (In Millions)

Program	Department	2021-22 Package	Proposed 2022-23 Package				Total
		Total	2022-23	2023-24	2024-25	2025-26	
Light-Duty Vehicles							
Clean Vehicle Rebate Project	CARB	\$525	—	—	—	—	—
Clean Cars 4 All and Other Equity Projects	CARB	400	\$171 ^a	\$50	\$35	—	\$256
Transportation Equity, Mobility, and SCS Pilots	CARB, CalSTA	—	65	130	134	\$90	419
ZEV Fueling Infrastructure Grants	CEC	300	100	220	210	70	600
Equitable At-Home Charging	CEC	—	60	100	90	50	300
Transportation Package ZEV ^b	CalSTA	407	77	77	77	76	383 ^c
Heavy-Duty and Off-Road Vehicles							
Drayage Trucks & Infrastructure	CARB, CEC	\$535	—	\$200	\$170	\$105	\$475
Transit Buses and Infrastructure	CARB, CEC	290	—	200	160	100	460
School Buses and Infrastructure	CARB, CEC, CDE	450	\$1,500	—	—	—	1,500
Clean Trucks, Buses, and Off-Road Equipment	CARB, CEC	700	700 ^d	200	165	35	1,100
Ports	CARB, CEC	—	—	100	200	100	400
Near-Zero Heavy-Duty Trucks	CARB	45	—	—	—	—	—
Emerging Opportunities	CARB, CEC	—	20	50	86	44	200
Other							
ZEV Consumer Awareness	GO-Biz	\$5	—	—	—	—	—
ZEV Manufacturing Grants	CEC	250	—	—	—	—	—
Totals		\$3,907	\$2,693	\$1,327	\$1,327	\$746	\$6,093
^a Includes \$76 million Greenhouse Gas Reduction Fund.							
^b Includes federal funds.							
^c Includes \$76 million in 2026-27.							
^d Includes \$600 million Greenhouse Gas Reduction Fund.							
ZEV = zero-emission vehicle; CARB = California Air Resources Board; SCS = Sustainable Communities Strategies; CalSTA = California State Transportation Agency; CEC = California Energy Commission; CDE = California Department of Education; and GO-Biz = Governor's Office of Business and Economic Development.							

(Source: Legislative Analyst's Office)

Background. Since 2006, California has set several important goals to reduce greenhouse gas (GHG) emissions and address the threat posed by the global climate crisis and to the public health of Californians. These goals have predominantly been set via Executive Order, rather than legislation. These include:

- Reducing GHG emissions to 40 percent below 1990 levels by 2030.
- Reducing short-lived climate pollutant emissions, such as methane, to 40 to 50 percent below 2013 levels by 2030.

- Achieving a carbon-neutral economy by 2045.
- Setting specific goals to boost the supply of ZEVs and charging and fueling stations, including:
 - Putting at least 1.5 million ZEVs on the road by 2025.
 - Installing 200 hydrogen-fueling stations and 250,000 battery-electric vehicle chargers, including 10,000 direct-current or fast chargers, by 2025.
 - Putting 5 million ZEVs on the road by 2030.

Executive Order N-79-20 set additional and specific zero-emission vehicle targets, including:

- 100 percent of in-state sales of new passenger cars and trucks by 2035
- 100 percent of the state's fleet of medium- and heavy-duty vehicles in the state by 2045 where feasible and by 2035 for drayage trucks
- 100 percent of the state's fleet of off-road vehicles and equipment operations by 2035, where feasible.

The state has historically pursued these goals with a combination of regulations, grant programs for infrastructure (such as the CEC's Clean Transportation Program and CARB's Heavy Vehicle Infrastructure Program (HVIP)), by rebates for individual purchases of zero emission vehicles, such as the Clean Vehicle Rebate Program (CVRP), and CARB's Heavy Vehicle Incentive Program (HVIP). These programs have operated parallel efforts by regulated utilities and private interests to expand ZEV infrastructure, including ratepayer-funded efforts at Investor-Owned Utilities, settlement agreements (like Electrify America's investments funded by the Volkswagen emissions settlement), and private investment (like Tesla's charging network).

The 2021-22 budget included \$2.7 billion for a variety of programs related to zero emission vehicles. This was intended to be the first year of a three-year, \$3.9 billion investment. Total investments included:

- \$500 million for the Clean Trucks, Buses, and Off-Road Equipment program at the California Air Resources Board, which funds heavy-duty and off-road vehicles and equipment, such as heavy-duty trucks and cargo-handling equipment at ports. This included at least \$25 million for the Clean Off-Road Equipment program. The budget included language prohibiting the use of these funds to displace workers. This funding was intended to be spent over multiple years.
- \$150 million in 2021-22, and a total of \$400 million over three years, for the Clean Cars 4 All program, which provides financial assistance for purchases of used zero and near zero emission vehicles.
- \$525 million for the Clean Vehicle Rebate Project, which provides financial assistance for purchases of new light-duty zero-emission vehicles. This included \$10 million in rebates for e-bike purchases. This is intended to provide multiple years of funding for the CVRP.
- \$475 million in 2021-22, and a three-year total of \$1.275 billion, for targeted investments in zero-emission drayage trucks, transit buses, and school buses and related infrastructure. This included \$65 million in 2021-22 for a pilot project for expanded use of zero-emission drayage trucks at California ports.

- \$500 million for investments in zero-emission vehicle charging and fueling infrastructure, split between light duty and medium / heavy duty vehicle infrastructure.
- \$125 million in 2021-22 and \$125 million in 2022-23 for grants to companies involved in the ZEV manufacturing supply chain.
- \$407 million, from a variety of funding sources, for additional investments in zero emission transit equipment and infrastructure. This funding will be allocated through the existing Transit and Intercity Rail Capital Program.
- \$50 million for near-zero truck replacement, to provide financial incentives to replace aging medium and heavy-duty trucks with new near-zero emission trucks.

Staff Comments. The Administration has proposed a significant expansion of the state’s investments in zero-emission vehicles. Most of the proposed funding would continue and/or expand existing programs, such as heavy-duty and off-road programs, ZEV fueling infrastructure programs, and programs focused on cleaner vehicles and mobility for low-income households and disadvantaged communities (also known as transportation equity programs). The most significant new programs and programmatic changes proposed by the Governor include:

- **School Bus Program (\$1.5 Billion Proposition 98 General Fund).** This program would provide competitive grants to school districts to replace nonelectric school buses with electric buses and purchase related infrastructure.
- **ZEV Fueling Infrastructure Grants (\$600 Million General Fund).** The proposal includes a total of \$600 million over four years—with \$100 million in 2022-23—for electric vehicle (EV) charging infrastructure. Unlike last year’s ZEV package, this proposal would prioritize fast chargers.
- **Federal Funding for ZEV Infrastructure (\$383 Million Federal Funds).** The proposal includes federal funding available to California through the federal Infrastructure Investment and Jobs Act (IIJA) enacted in November 2021. Specifically, it includes \$383 million for five years from the National Electric Vehicle Infrastructure Formula Program, which is intended to support fueling infrastructure along designated alternative fuel corridors, such as along the Interstate Highway System.
- **Equitable At-Home Charging (\$300 Million General Fund).** The proposal includes a total of \$300 million over four years—with \$60 million in 2022-23—for EV charging infrastructure at multi-unit dwellings and low-income, single-family homes. The funds would be used for Level 2 charging stations and electrical panel upgrades. (Level 2 charging stations provide about 14-35 miles of driving range per hour of charging.)
- **Potential Sustainable Communities Strategies (SCS) Pilots.** As part of the proposed funding for SCS pilots and other equity programs, CARB would consider creating a new pilot program that would incentivize transportation agencies to prioritize projects that reduce vehicle miles traveled (VMT), rather than roadway expansion projects. The proposed budget does not provide funding explicitly for this pilot project, but CARB would consider it as part of its typical Low Carbon Transportation Investment Plan process after the budget is adopted.

Over two-thirds of the proposed funding would support heavy-duty vehicle programs. (This includes the \$1.5 billion for electric school buses.) A majority of the funding in the 2021-22 ZEV package was also targeted at such programs. Under the Governor’s plan, about 62 percent of the

combined \$10 billion total from both ZEV packages would go to heavy-duty vehicle programs. Funding for light-duty vehicles would be targeted to transportation equity and mobility programs, as well as fueling infrastructure. No new funding would be allocated to the state’s main ZEV rebate program, the Clean Vehicle Rebate Project (CVRP), but \$100 million would be available to support higher CVRP rebate amounts for low- and moderate-income households.

The proposed funding would support a variety of vehicles, EV charging stations, off-road equipment, and other projects. The table below lays out the estimated outcomes from these investments. The estimated amounts are subject to uncertainty because (1) the final allocations will depend on decisions made by departments about how to allocate the funding to specific subprograms or projects and (2) actual deployment amounts could also depend on which technologies are actually purchased. For example, the number of vehicles supported through the clean truck and bus vouchers depends on which technologies businesses and governments ultimately choose to purchase with the vouchers.

Estimated Number of Vehicles, Chargers, and Projects Supported With Proposed Funding

(In Millions)

Program	Amount	Estimated Deployment
Light-Duty		
ZEV Fueling Infrastructure	\$600	5,000 DC fast chargers
Transportation Equity, Mobility, and SCS Pilots	419	100 projects ^a
Equitable At-Home Charging	300	28,000 Level 2 MUD chargers; 50,000 home chargers
Vehicle Rebates for Low-Income Consumers	100	20,400 vehicles
Financing Assistance for Low-Income Consumers	80	12,300 vehicles
Clean Cars 4 All	76	6,600 vehicles
Heavy-Duty and Off-Road		
Clean Trucks, Buses, and Off-Road Equipment	\$600	4,100 vehicles and equipment
Transit Buses and Infrastructure	320	1,600 buses
Ports	250	860 pieces of off-road equipment
Drayage Trucks and Infrastructure	225	1,000 trucks
Emerging Opportunities	100	10 projects ^a
^a Each project may fund multiple vehicles and equipment.		
Source: California Air Resources Board and Energy Commission.		
SCS = Sustainable Communities Strategies; ZEV = zero-emission vehicle; and MUD = multi-unit dwellings.		

Source: Legislative Analyst’s Office

Additionally, the federal Infrastructure Investment and Jobs Act (IIJA) contains significant new funding for zero emission vehicle charging and fueling infrastructure. Funding for one of the programs—\$383 million to Caltrans through the National Electric Vehicle Infrastructure Formula Program—is already part of the Governor’s proposed budget. According to recently released federal guidance, the state must submit a plan to the federal government describing how funding will be used. The other two charging and fueling infrastructure grant programs are competitive programs and detailed federal guidance is not yet available. For all programs, the federal government will only pay for a portion of the costs, with the remainder coming from other private or public sources. Additional state funding for charging infrastructure, above and beyond what was approved in 2021-22, would increase the state’s chances of effectively competing for this funding.

Lastly, the Department of Finance estimates that \$260 million of the proposed 2022-23 spending in the Governor’s ZEV package is for activities that are excludable from the State Appropriations Limit. If the Legislature were to approve a lower amount of spending on the proposed activities that the administration excludes from SAL, it would generally need to repurpose the associated funding for other SAL-related purposes, such as tax reductions or an alternative excluded expenditure.

LAO Comments.

Mobile Source Emission Programs Aim to Achieve Different Policy Goals... The state has a wide variety of mobile source incentive programs. These programs aim to achieve one or more different policy goals, including: (1) near-term GHG reductions; (2) near-term air pollution reductions; (3) advancements in zero-emission technologies, which could have longer-term GHG and air quality benefits; and/or (4) ensuring program benefits are distributed equitably across different areas and populations, often with a focus on reducing pollution in areas that are disproportionately low-income and/or have poor air quality. All four of these are reasonable policy goals. However, in many cases, the Legislature will have to balance the trade-offs between these goals when determining how to prioritize funding across different programs. In addition, some programs might have other policy goals, such as increasing mobility.

...And Degree of Effectiveness Varies Between Programs. As shown below, the degree to which mobile source incentive programs achieve each policy goal varies by program. For example, some programs are more cost-effective at reducing GHGs, while other programs are more cost-effective at reducing air pollution. Furthermore, some programs do more to promote zero-emission technological advancements that can help meet long-term emissions goals, while others do more to target funding in ways that benefit low-income and disadvantaged communities.

Mobile Source Program Effectiveness Varies Between Program and Policy Goal

Program	GHG Cost-Effectiveness (\$/Ton) ^a	Air Pollution Cost-Effectiveness (\$/Weighted Ton) ^a	Technology Advancement ^b	Benefiting Priority Populations ^c
Transportation Equity				
Low-Income Financing Assistance	\$830	\$538,000	Low-Medium	84%
Clean Cars 4 All	920	438,000	Low-Medium	97
Clean Mobility in Schools	2,450	235,000	Low-Medium	100
Clean Mobility Options	11,400	4,122,000	Low-Medium	100
Sustainable Transportation Equity Project	5,050	4,845,000	Low-Medium	100
Heavy-Duty and Off-Road ZEVs				
Clean Truck and Bus Vouchers (HVIP)	\$350	\$96,200	Medium	63%
Off-road Equipment Vouchers (CORE)	1,710	481,000	Medium	73
Demo/Pilots	18,800	110,000	Medium-High	100
Heavy-Duty Retirement and Replacement				
FARMER	\$1,679	\$8,979	Low	70%
Carl Moyer	1,670 ^d	11,700	Low	N/A
AB 617 Incentives	1,661	12,486	Low-Medium	94
^a CARB estimate.				
^b LAO estimate.				
^c Administration's estimate.				
^d LAO estimate based on average of FARMER and AB 617 incentives.				
GHG = greenhouse gas; ZEV = zero-emission vehicle; HVIP = Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project; CORE = Clean Off-Road Equipment; FARMER = Funding Agricultural Replacement Measures for Emission Reductions; N/A= not available; CARB = California Air Resources Board; and AB 617 = Chapter 136 of 2017 (AB 617, C. Garcia).				

Mobile Source Emission Reduction Programs Are Relatively Costly Approaches to Near-Term GHG Emission Reductions. Of the programs listed earlier in Figure 6, the most cost-effective program for reducing near-term GHGs is the Clean Truck and Bus Voucher Program with estimated costs of \$350 per ton. The other incentive programs have costs close to or exceeding \$1,000 per ton. By comparison, other state programs are likely more cost-effective. For example, current cap-and-trade allowance prices are about \$30 per ton and Low Carbon Fuel Standard credits are about \$150 per ton. (In our view, these allowance and credit prices are a reasonable proxy for the marginal costs of near-term GHG emission reductions from these programs.) Also, according to the administration's estimates, other GGRF funded incentive programs, such as methane reduction programs, cost less than \$100 per ton.

Heavy-Duty Retirement and Replacement Programs Are Relatively Cost-Effective Approach for Air Pollution Reductions. The most cost-effective programs for reducing near-term local criteria pollutants appear to be the Funding Agricultural Replacement Measures for Emission Reductions (FARMER) Program, the Carl Moyer Program, and AB 617 incentives (also known as Community Air Protection incentives). Estimated costs to reduce a weighted ton of criteria pollution ranges from \$8,979 to \$12,486 per ton in these programs, compared to costs ranging from the hundreds

of thousands of dollars to millions of dollars per ton for most other programs. These programs largely provide funding to retire older, high-polluting engines and replace them with cleaner fossil fuel engines (such as natural gas), rather than focusing on zero-emission technologies such as battery electric and fuel cells. Each of these programs would receive funding under the Governor's budget, but they would not receive additional funding as part of the proposed ZEV package.

The cost-effectiveness estimates for GHGs and air pollution reductions illustrate some of the important trade-offs the Legislature faces when determining its budget priorities for programs intended to reduce emissions. Of the programs analyzed in this report, the Hybrid and Zero-Emission Truck and Bus Voucher Incentive Project (HVIP) would achieve the greatest GHG reductions, but the heavy-duty retirement and replacement programs would achieve the greatest air pollution reductions. Notably, in the near term, none of the programs would cost-effectively reduce both GHGs *and* air pollution.

Programs Promoting Technological Advances Could Help Achieve Long-Term Emission Reductions. Some programs aim to help advance ZEV technologies, which could help achieve long-run GHG and air pollution reduction goals. Also, in our view, policies that attempt to promote research, development, and demonstration of new technologies is a reasonable role for government. This is because, without such support, the private sector would tend to underinvest in these activities and cleaner technologies might not reach the commercial market in a timely manner (or at all).

Unfortunately, it is difficult to assess these technology benefits quantitatively. In general, heavy-duty and off-road technologies are farther behind in technological and market development than light-duty ZEVs, so there is greater potential for technological advancement. In our view, pilot and demonstration projects generally have the most potential technological benefits because they are supporting early-stage technologies and projects that very likely would not otherwise be funded by the private sector.

Role of Transportation Equity Programs in Achieving Policy Goals Is Unclear. Compared to other mobile source programs, it is unclear whether the transportation equity programs achieve any of the Legislature's policy goals effectively. First, transportation equity programs appear to be a relatively costly way to reduce both local pollution and GHGs. Second, most of these programs focus on light-duty vehicle and mobility programs which, in our view, only have modest potential to drive technological advancements—likely less than some of the heavy-duty ZEV programs. Finally, although the vast majority of funding from these programs goes to projects that benefit low-income and disadvantaged communities, the percentage is not significantly more than some of the other programs. For example, the AB 617 incentive program allocates 94 percent of funds to projects that benefit priority populations and achieves criteria pollutant reductions much more cost-effectively than the transportation equity programs.

LAO Recommendations:

Consider Whether Different Mix of Spending Better Achieves Legislative Priorities. Ultimately, budget allocations for mobile source programs will depend on how the Legislature prioritizes different policy goals. In determining its priorities, we recommend the Legislature consider such factors as:

- ***Near-Term GHG Reductions.*** To the extent near-term GHG reductions are a priority, HVIP is one of the most cost-effective mobile source incentive programs. However, overall, the GHG reduction costs for mobile source incentive programs are relatively high, and the Legislature might want to consider relying on other programs for the most cost-effective GHG reductions, including regulatory programs (such as cap-and-trade) or other spending programs that have lower costs (such as methane reduction programs).
- ***Near-Term Local Air Pollution Reductions.*** To the extent total near-term reductions in local air pollution are a priority, then heavy-duty retirement and replacement programs such as Carl Moyer and FARMER are most cost-effective.
- ***Technology Advancement.*** To the extent *long-term* GHG and air pollution reductions are a priority, then the Legislature could target funding to programs that focus on advancing ZEV technologies in their early stages of market development. For example, it could prioritize funding for heavy-duty pilots and demonstration projects and vouchers for heavy-duty vehicles and off-road equipment.
- ***Air Quality Benefits in Disadvantaged Communities.*** If a priority is ensuring air quality improvements mostly accrue to disadvantaged and low-income communities, then the Legislature could target funds to programs that reduce criteria pollutants cost-effectively *and* where the vast majority of the spending benefits low-income and disadvantaged communities, such as the AB 617 incentive program.

Direct Administration to Provide More Detail on New Programs. We recommend the Legislature direct the administration to report at budget hearings on the details of the new programs that are being proposed, including the Equitable At-Home Charging program and potential SCS pilots. For example, how will the Equitable At-Home Charging program target renters? How will the potential SCS pilots be different from other programs aimed at reducing VMT? Additional detail could help the Legislature better evaluate the merits of the proposed programs.

Consider Delaying Funding for Infrastructure Until Administration Develops Plan to Best Leverage Federal Funds. We recommend the Legislature direct the administration to report this spring on its plan for ensuring state funding for EV charging infrastructure will complement new federal funding. This includes a description of how, if at all, state funding can be used to leverage federal funding for EV charging infrastructure or fill in the major gaps in federal funding. So far, there is limited detail available from the federal government about how some of the new programs will be implemented. If there is still insufficient detail at the time the Legislature needs to adopt a budget to meet its constitutional requirement to pass a budget, the Legislature could delay additional state funding for light-duty ZEV infrastructure until more details are available and the administration develops a clear strategy.

Direct Administration to Report on Program Evaluation Strategies. To ensure the Legislature has good information about the net effects of its mobile source programs, we recommend the Legislature direct the administration to report at budget hearings about current efforts to improve its program evaluation efforts. This report should include an update on efforts to more accurately assess the effects of individual programs in light of the interactions and overlap between regulatory and incentive programs. To the extent the Legislature authorizes funding to create new programs or expand existing programs, we recommend requiring the administration to develop a plan for program evaluation prior to implementing the program and awarding the funds. We recognize that

this would likely delay project implementation slightly but would greatly improve the quality of information available to the Legislature in future years to help inform future budget and policy decisions.

Consider Trade-Offs of Multiyear Funding Commitments. We recommend the Legislature consider the trade-offs associated with over \$3 billion in multiyear General Fund commitments proposed by the Governor. On the one hand, these commitments can provide market certainty and make it easier for departments to design and administer programs. On the other hand, they have the potential to reduce future legislative oversight and create General Fund pressures in future years. It is also worth noting that the 2021-22 budget package already included 2023-24 funding commitments for many of these same ZEV-related programs. To the extent the Legislature provides additional multiyear funding, we recommend it prioritize out-year funding for programs that can help provide market signals to businesses making long-term investment decisions, such as heavy-duty and off-road voucher incentives.

Staff Recommendation: Hold Open

0540 CALIFORNIA NATURAL RESOURCES AGENCY
0650 GOVERNOR’S OFFICE OF PLANNING AND RESEARCH
3360 CALIFORNIA ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION
3560 STATE LANDS COMMISSION
3860 DEPARTMENT OF WATER RESOURCES
3900 CALIFORNIA AIR RESOURCES BOARD
8660 CALIFORNIA PUBLIC UTILITIES COMMISSION

Issue 3: Clean Energy Investments

Governor’s Budget. The budget includes more than \$2 billion (\$2.035 billion General Fund over two years, \$1.5 million Energy Resources Programs Account in 2022-23, \$2.6 million Public Utilities Commission Utilities Reimbursement Account ongoing) for a Clean Energy Investment Plan that will spur additional innovation and deployment of clean energy technologies in the energy system. This includes:

- **Long Duration Storage:** \$380 million General Fund over two years to invest in long duration storage projects throughout the state to support grid reliability. This investment will help with resilience in the face of emergencies, including wildfires, and provide a decarbonized complement to intermittent renewables, which will provide the state with additional energy storage options during periods of low renewable power availability.
- **Green Hydrogen:** \$100 million General Fund in 2022-23 to advance the use and production of green hydrogen, in which electricity is used to split water into oxygen and hydrogen. Green hydrogen is critical to the decarbonization of California’s economy and achieving carbon neutrality.
- **Industrial Decarbonization:** \$210 million General Fund over two years to accelerate industrial sector decarbonization. There are over 40,000 industrial facilities in California, employing over 1.2 million people. This funding will provide a grant program for the purchase and deployment of commercially available advanced technologies and equipment to decarbonize this sector while focusing on reducing criteria pollutants in disadvantaged communities.
- **Food Production Investment:** \$85 million General Fund in 2022-23 to accelerate the adoption of energy technologies at California food production facilities. Grants will be provided to California food producers to install energy efficiency and renewable energy technologies that will reduce operating costs, as well as climate emissions.
- **Offshore Wind Infrastructure:** \$45 million General Fund in 2022-23 to create the Offshore Wind Energy Deployment Facility Improvement Program, which will invest in activities to advance the capabilities of deploying offshore wind energy in federal waters off California in the areas of facility planning and development.
- **Oroville Pump Storage:** \$240 million General Fund over two years to build a temperature management project to address temperature issues at the Oroville Dam that will allow a pump-storage project to operate at greater capacity for the benefit of the statewide electrical grid.

- **Energy Modeling to Support California’s Energy Transition:** \$7 million General Fund in 2022-23 to support improvements to energy modeling activities, such as electricity system models to determine what types of electricity generation resources need to be built to meet state clean energy goals while maintaining reliability. Updating these models to reflect climate change impacts will improve state energy planning and policy development.
- **Equitable Building Decarbonization:** Older buildings with minimal insulation, air gaps, and non-existent or low-performing space heating and cooling are not equipped to adequately withstand extreme heat and protect occupants. The Budget includes \$962.4 million General Fund over two years for critical investments, including:
 - \$622.4 million General Fund over two years for a statewide low-income direct-install building retrofit program, including funding for replacement of fossil fuel appliances with electric appliances, energy-efficient lighting, and building insulation and sealing.
 - \$300 million General Fund over two years for consumer rebates for building upgrades, such as replacement of fossil fuel equipment with electric appliances.
 - \$40 million General Fund over two years to accelerate the adoption of ultra-low-global warming potential refrigerants.

These investments are summarized below:

Energy Package

(Dollars in Millions)

Department	Program	Fiscal Year 2022-23	Fiscal Year 2023-24	Two-Year Total
California Energy Commission	Incentives for Long Duration Storage Projects	\$140	\$240	\$380
	Green Hydrogen Grants for Green Electrolytic Hydrogen	\$100		\$100
	Industrial Decarbonization	\$110	\$100	\$210
	Food Production Investment Program	\$85		\$85
	Equitable Building Decarbonization	\$322.6	\$599.8	\$922.4
	Offshore Wind Infrastructure	\$45		\$45
	Energy Modeling to Support California's Energy Transition	\$7		\$7
Air Resources Board	Equitable Building Decarbonization - Accelerating Adoption of Ultra-Low Global Warming Potential Refrigerants	\$20	\$20	\$40
Department of Water Resources	Oroville Pump Storage	\$100	\$140	\$240
Various	Resources to Support Offshore Wind Generation and Energy Reliability	\$8.2	\$1.5	\$9.7
Total		\$937.8	\$1,101.3	\$2,039.1

Background. Chapter 488 of 2006 (AB 32, Núñez/Pavley) established the goal of limiting GHG emissions statewide to 1990 levels by 2020. In 2016, Chapter 249 (SB 32, Pavley) extended the limit to 40 percent below 1990 levels by 2030. Emissions have decreased since AB 32 was enacted and were below the 2020 target in 2019. However, the rate of reductions needed to reach the SB 32 target are much greater than the state has achieved to date.

The administration has also established long-term GHG goals. On September 10, 2018 Governor Brown issued Executive Order B-55-18 which established a statewide goal of achieving carbon neutrality by 2045—meaning annual GHG emissions are equal to or less than carbon dioxide sequestered or stored. Reducing net GHG emissions to near (or below) zero is also known as deep decarbonization. Notably, the Legislature has not adopted long-term statewide deep decarbonization goals in law. However, as discussed below, the Legislature has established specific long-term decarbonization goals in certain sectors, such as the electricity sector.

Over the last decade, the electricity sector has been the primary driver of statewide GHG emission reductions. Reductions from the electricity sector mostly reflect a changing mix of resources used to generate electricity—primarily large increases in renewables (solar and wind) along with a decline in coal generation. A wide variety of factors have contributed to this shift, including

technological advancements, changing economic conditions, federal policies, and state policies. Notably, emissions from other sectors—including residential and commercial buildings, industrial facilities, and high global warming potential products (such as refrigerants)—have remained relatively steady or increased over the last several years.

Chapter 312 of 2018 (SB 100, de León) established a state policy of providing 100 percent of retail electricity with zero-carbon resources by 2045. 59 percent of retail electricity sales came from zero-carbon resources in 2020, including 36 percent from resources that qualify as renewable under the state’s Renewable Portfolio Standards, such as onshore wind and solar photovoltaic.

California commercial and residential buildings generated nearly 100 million tons of emissions in 2018—or nearly one-quarter of annual statewide emissions. The three main categories of GHG emissions from buildings are:

- **Combustion.** Emissions from burning fossil fuels on site—primarily natural gas—largely related to space heating and water heating.
- **Refrigerants.** Leakage of certain types of refrigerants, such as hydrofluorocarbons, found in supermarket refrigeration and air conditioning units.
- **Electricity Generation.** Indirect emissions from the electricity system that generates the electricity for buildings.

Historically, state efforts to reduce emissions from buildings has focused on improving the energy efficiency of buildings and appliances. For example, the California Energy Commission (CEC) develops energy efficiency building codes and standards for new buildings. Additionally, utilities operate programs using ratepayer funds—totaling at least several hundred million dollars annually—that aim to promote energy efficient appliances and buildings. The California Department of Community Services and Development (CSD) administers a wide variety of other programs that provide energy efficiency upgrades for low-income households, including the state Low-Income Weatherization Program and the federal Weatherization Assistance Program. Finally, we note that the state supports energy efficiency activities at state buildings, schools, and universities.

In recent years, state efforts have increasingly focused on electrification as a key strategy for reducing emissions from buildings. This strategy aims to promote the use of electric appliances—such as heat pumps—instead of natural gas furnaces and water heaters. For example, Chapter 378 of 2018 (SB 1477, Stern) authorized the California Public Utilities Commission (CPUC) to develop the Building Initiative for Low-Emissions Development (BUILD) Program to encourage the installation of electric appliances in new, low-income residential housing in investor-owned utility (IOU) territories. CPUC designated CEC as the program administrator. Senate Bill 1477 directed CPUC to support BUILD with \$80 million from revenue collected from cap-and-trade allowances that are given to IOUs and then subsequently sold at auctions. (We describe the state’s overall cap-and-trade program in more detail later in this section.) In addition, a variety of other program, planning, and regulatory efforts have begun to focus on electrification as a key strategy for long-term building decarbonization.

The 2021-22 budget included \$172 million for various energy-related activities, including programs intended to promote building electrification, planning and permitting renewable energy projects, and activities intended to promote electric reliability. This included \$75 million General

Fund to CEC to expand the BUILD program to new market rate residential buildings in all areas of the state, including publicly owned utility territories.

The state administers relatively few GHG emissions reduction programs for industrial sources. The main emission reduction program for industrial sources is the cap-and-trade program, which covers about 75 percent of statewide GHG emissions, including transportation, natural gas, electricity production, and industrial sources. Under this program, a limited number of permits to emit GHGs are issued, and “covered entities” can buy and sell allowances. The program relies on market incentives—reflected through permit prices—and flexibility to encourage the lowest-cost emission reduction activities.

Staff Comments. The Governor’s proposal includes the following components:

Long-Duration Storage Projects. The proposed budget includes a total of \$380 million General Fund (\$140 million in 2022-23 and \$240 million in 2023-24) for demonstrations and early-stage deployment of long-duration storage technologies—defined as technologies that can store energy for eight hours or more—that are on the verge of commercialization. According to the administration, the goal of the program is to help support the advancement of promising technologies from the demonstration phases to commercial deployment in the next five to ten years. Examples of technologies that might receive funding include flow batteries (batteries that use a different chemical process than traditional batteries), thermal storage, and compressed air technologies. (Pumped hydroelectric storage and lithium-ion batteries would not be eligible technologies because they are not considered emerging technologies.)

The proposed program would be implemented in two phases. The first phase would include 12 to 16 demonstration projects ranging from three megawatts (MW) to five MW of capacity. The second phase would include fewer projects—roughly seven to ten—but most projects would range from five MW to ten MW. Some projects will also focus on much longer durations in the range of 20 to 100 hours. For context, a recent analysis from the state’s energy agencies found that there is a need for a minimum of about 1,000 MW of long-duration storage by 2030 and 4,000 MW by 2045 to meet the state’s SB 100 goals of 100 percent zero-carbon electricity.

Green Hydrogen Projects. The proposed budget includes \$100 million General Fund in 2022-23 to advance green hydrogen technology and explore different end uses. Green hydrogen is produced by splitting water into hydrogen and oxygen using renewable electricity. The administration estimates that the funding would support 10 to 15 commercial demonstration projects. About two-thirds of the funding would focus on lowering the cost of electrolyzers used to produce green hydrogen. Other eligible projects include those that demonstrate the use of green hydrogen for industrial activities, power plants, and energy storage. The administration has proposed trailer bill language that limits eligible projects to those that produce electrolytic hydrogen for delivery or use in California, and emits zero or de minimis amounts of greenhouse gases on a lifecycle basis. The legislature may want to consider the extent to which that definition captures the types of projects the legislature would like to fund. Additionally, there is potentially significant federal funding available for green hydrogen “hubs.” This funding represents a potentially strategic investment that could make the state more competitive for those federal grant funds.

Industrial Decarbonization. The Governor proposes a total of \$210 million General Fund (\$110 million in 2022-23 and \$100 million in 2023-24) to deploy advanced technologies or develop novel strategies to reduce emissions at industrial facilities. According to the administration, eligible projects could include electrification of heating processes that now use natural gas, energy efficiency projects, and deploying carbon capture for use in products (such as concrete). Carbon capture projects with geologic storage and petroleum and gas production facilities would be ineligible.

Food Production Investment Program. The Governor's proposal includes \$85 million for the CEC's Food Production Investment Program (FPIP). FPIP provides grants to California food producers to install energy efficiency and renewable energy technologies in food processing plants that will reduce operating costs and GHG emissions. There are a total 7,262 food and beverage processing facilities in California emitting about 3.2 million MT CO₂e annually. FPIP has administered a total of \$116 million in funding since its creation, with no additional funds allocated since 2018. FPIP has funded 50 grant awards at 66 project sites. Fifty-six of these sites are in and benefitting disadvantaged or low-income communities. Approximately half of these project sites are in the San Joaquin Valley. The investment made previously in FPIP are estimated to lead to a reduction of 164,000 MT CO₂e per year. This translates to a lifetime reduction of 3.3 million MT CO₂e per year and a cost per metric ton of \$35 a ton assuming a conservative 20-year project lifetime.

Equitable Building Decarbonization. The Governor's budget provides a total of \$922.4 million General Fund over two years (\$323 million in 2022-23 and \$600 million in 2023-24) to CEC for two new residential building decarbonization programs. These two programs include (1) \$622.4 million for a program to directly install energy efficient and electric appliances in low- and moderate-income households and (2) \$300 million for a statewide rebate program for electric appliances that replace natural gas appliances.

Under the direct install program, contractors would undertake a variety of energy efficiency and building electrification changes (such as heat pumps or electrical panel and wiring upgrades) at no cost for eligible households. Eligible households would include households in disadvantaged communities (as measured in CalEnviroScreen), at or below 80 percent of statewide median income, or with income limits of moderate or below as identified by the California Housing and Community Development. CEC estimates that the program could reach 13,000 to 274,000 existing buildings at an estimated cost ranging from \$2,000 to \$40,000 per building. The statewide rebate program would provide incentives to purchase electric appliances, such as heat pump space and water heaters. Based on estimated costs of \$1,000 to \$8,000 per building, about 40,000 to 313,000 buildings would receive rebates under this program.

Low Global Warming Potential Refrigerants. The proposal includes \$40 million to expand the existing program to accelerate the deployment of next generation ultra-low GWP refrigerants in existing building equipment. Most refrigeration and air conditioning systems deployed in California utilize high GWP refrigerants that are so potent that their leakage and disposal make up roughly 3-4 percent of the state's GHG inventory. This program received \$1 million in the 2019-20 budget, which allowed ARB to support 15 projects to reduce high-GWP refrigerant usage in

grocery stores. The Administration has indicated that there are roughly 4,000-5,000 refrigeration systems across the state that could be eligible for funding.

Oroville Pump Storage Project. The Governor proposes a total of \$240 million General Fund (\$100 million in 2022-23 and \$140 million in 2023-24) to modify the Oroville Dam complex so it can use its existing pump back operations to provide long-duration energy storage without adverse impacts on spawning salmon in the Feather River. Funding would support the planning, design, permitting, and construction of the modifications necessary for the dam to use its existing 480 MW pumping capacity. The proposed funding would also support the construction of a flow control facility with a potential for an additional 20 MW hydroelectric generation.

Offshore Wind. The proposal includes \$45 million for a program to make investments in facility planning and development activities that will advance the capabilities of deploying offshore wind energy in federal waters off California. The program will include three categories that target different phases of preparing waterfront facilities in California to support offshore wind energy development:

1. Developing individual or regional facility retrofit concepts and investment plans.
2. Supporting final design, engineering, environmental studies and review, as well as construction of retrofits.
3. Providing cost share funding to applicants that apply for and receive a federal award that includes activities consistent with those identified above. This would apply to funding for both the development of concepts and plans as well as actual project development.

The Administration has indicated that the intent is to provide roughly \$5 million for the development of concepts and plans, and \$40 million for project funding.

Other Proposals. The proposal includes \$4.1 million to implement AB 525 to develop a strategic plan for offshore wind energy development in federal waters off the coast of California. The funds would support the CEC, Ocean Protection Council, State Lands Commission, and the Governor's Office of Planning and Research.

The budget also includes \$3 million to support actions that expand energy supply and storage in California directed by studies and assessments by the CEC, CPUC, and the California Independent System Operator (CAISO). This funding would be budgeted to DWR to provide consultation for engineering support to perform comprehensive site assessments, site prioritization, site selection, and site outreach to inform decisions as to the capability and practicality of making clean power generation commercially available to mitigate energy shortages.

LAO Comments.

Package Generally Targets a Reasonable Set of Activities to Promote Deep Decarbonization. In our view, the Governor's proposed package reflects a reasonable set of activities to help the state achieve deep decarbonization. First, funding would support key areas where substantial technological progress could help lower the cost of achieving long-term GHG goals. This includes technologies that can provide zero-carbon electricity at times when renewable resources are not

sufficient to meet electricity demand (such as long-duration storage and green hydrogen) and technologies that can help reduce emissions from industrial activities (such as green hydrogen and carbon capture and storage). In general, we think there is a reasonable policy argument for government funding to promote the development of newer technologies because the private sector will likely underinvest in these activities. One-time state funding to support demonstration projects to explore different technology options as proposed by the Governor could help advance these technologies, which in turn could help the state achieve some of its long-term GHG goals at lower cost. In addition, since these technologies could also be used in jurisdictions outside of California, any advancements and cost reductions could have broader GHG benefits if these low-carbon technologies get adopted in other jurisdictions.

The other largest pieces of funding—the equitable building decarbonization programs—target one of the largest sources of statewide GHG emissions. Furthermore, these programs would focus on *existing* buildings, which represents the vast majority of building-related emissions and pose some of the most significant challenges to building decarbonization. For example, the long lifespan and slow turnover of major appliances in buildings means a transition to newer technologies in existing buildings can take decades. As a result, some near-term actions could be important for meeting long-term GHG goals.

Allocating State General Fund, Rather Than Ratepayer Funds, Has Merit. Many of state’s clean energy programs historically have been paid for by IOU ratepayers through higher electricity rates, even though some of the primary goals of these programs (such as GHG reductions) accrue to the broader public. We think there is a strong rationale for using General Fund for programs that aim to provide broad societal benefits. Additionally, the costs for clean energy programs are one factor that contributes to California’s relatively high retail electricity rates. (There are many other factors that impact electricity rates, which we do not discuss in this brief.) Electricity rates in California are more than twice as much as the estimated marginal social costs of providing electricity in California, even after accounting for environmental damages. These higher rates have a variety of adverse effects, including:

- ***High Electricity Rates Discourage Electrification.*** As discussed above, one strategy for deep decarbonization is electrification, including switching from natural gas appliances to electric appliances. Household and business decisions about appliance purchases depend, in part, on how much they would have to pay for electricity to operate the electric appliances. As a result, high electricity rates can discourage adoption of electric appliances.
- ***Electricity Rates Are a Regressive Approach to Raising Revenue.*** On average, lower-income households tend to spend a greater share of their income on electricity than higher-income households. As a result, collecting revenue through electricity rates is a relatively regressive approach to funding clean energy programs.

Balancing Long-Term Benefits Against Near-Term Priorities. Much of the proposed funding is focused on activities intended to meet long-term, deep decarbonization goals. Although the proposed programs could have merit in the long run, some of these newer technologies and projects might take at least five to ten years to be commercially available, and even longer to become cost-competitive. Some ultimately may not ever achieve commercial viability. As a result, the GHG reduction benefits are likely to be relatively modest over the next several years. The Legislature will want to balance the potential long-term benefits of the programs in the Governor’s

package with other near- and medium-term priorities. For example, some alternative spending options include:

- ***Programs Aimed at Meeting 2030 GHG Goals.*** The state’s 2030 GHG goals will be difficult to meet. The Legislature could redirect some of the proposed funding to other programs that likely do more to help meet the state’s 2030 goals, such as methane reduction programs. In determining whether to prioritize General Fund resources for these such programs, the Legislature will want to consider the availability of other fund sources such as the Greenhouse Gas Reduction Fund.
- ***Other Energy-Related Programs.*** The Legislature could prioritize funding for other energy-related issues, such as grid resilience and reliability.
- ***Other Statewide Priorities.*** There might be other near-term statewide issues outside of the energy and climate policy area that the Legislature considers a higher priority use of General Fund.

Significant Federal Funding Available for Similar Activities. The federal Infrastructure Investment and Jobs Act (IIJA) that was enacted in November 2021 includes funding for a wide range of energy-related activities. Notably, there is a significant amount of funding available for clean hydrogen hubs, carbon capture demonstration projects, industrial emissions demonstration projects, long-duration storage demonstrations, and energy efficiency activities in low-income households. In many cases, detailed federal guidance about how the funding can be used and how it will be allocated is not yet available. As a result, it is unclear how the Governor’s clean energy package strategically targets funding in a way that best complements the federal IIJA funding. For example, are there opportunities to use state funding to leverage federal funds in a way that helps further the state’s goals? Some of the major federal programs—such as funding to prevent outages and enhance grid resilience—require a state match, but the Governor’s budget does not allocate funding for the state match. Another question is: Are there key gaps in federal funding that state funding can help fill? The Legislature might want to direct the administration to develop a strategy for using state funds in a way that best complements federal funding.

Expanding Scope of Certain Programs Could Improve Outcomes. The Governor’s proposal targets certain types of technologies and sectors, while excluding others. For example, although long-duration storage and green hydrogen could be important technologies needed to meet the state’s SB 100 goals, other technologies that could potentially achieve similar goals would not receive funding under the proposal, such as geothermal energy. As another example, carbon capture projects that store carbon in products (such as cement) would be eligible for the industrial decarbonization program, but carbon capture projects with geologic storage would not. Finally, the proposal provides funding to an existing program for GHG reduction projects at food processing facilities, instead of making that funding available to a broader set of industrial facilities.

Limiting the types of eligible projects and sectors that qualify for funding creates a risk that the funds are not used to support the most promising emission-reduction projects and technologies. A more technology- and sector-neutral approach can be especially important when there is uncertainty about which technologies will prove to be most feasible and cost-effective in the long run. The Legislature could consider modifying the programs and funding in ways that make a broader range of technologies and businesses eligible for the funding, while directing the

administration to select projects based on their potential to help achieve long-term GHG reductions in a cost-effective manner. For example, the Legislature could create a program that focuses on a broad range of technologies that help the state achieve its SB 100 goals, which could include long-duration storage and hydrogen power, as well as other technologies such as geothermal. Also, it could shift funding from the Food Production Incentive Program to the broader industrial decarbonization program, plus expand eligibility to include other technologies such as carbon capture with geologic storage. This could provide greater flexibility to fund the mix of industrial decarbonization projects that have the most GHG-reduction potential.

Reporting Requirements Needed to Facilitate Legislative Oversight. The administration does not propose any formal reporting to the Legislature on program outcomes. We recommend the Legislature consider adopting requirements that the administration report annually on key program outcomes, such as estimated emission reductions, technological progress, key lessons learned, and key challenges. The Legislature could use this information when making future policy and budget decisions in this area, including whether to continue any of the proposed programs after the two-year funding expires.

Some Proposed Spending Is Excluded from State Appropriation Limit (SAL). The California Constitution imposes a limit on the amount of revenue the state can appropriate each year. The state can exclude certain spending—such as on capital outlay projects—from the SAL calculation. The Department of Finance estimates that \$644.5 million of the proposed spending is for activities that are excludable from the SAL. In constructing its final clean energy package, we recommend the Legislature be mindful of SAL considerations. For example, if the Legislature were to approve a lower amount of spending on the proposed activities that the administration excludes from SAL, it would generally need to repurpose the associated funding for other SAL-related purposes, such as tax reductions or an alternative excluded expenditure.

Staff Recommendation: Hold Open.

8660 CALIFORNIA PUBLIC UTILITIES COMMISSION**Issue 4: ALJ Division Management and Proceeding Support**

Governor’s Budget. The budget includes \$1,223,000 ongoing from various special funds for eight (8.0) permanent positions to address deficiencies in management resources and proceeding support for the Administrative Law Judge (ALJ) Division.

Background. The CPUC sets utility rates and services; resolves consumer complaints; and establishes policies to implement state policies, promote safety, and protect customers of investor-owned electric, gas, communications, and water utilities; and regulated transportation carriers. To do this, the CPUC’s Administrative Law Judge (ALJ) Division conducts formal proceedings, similar to a court system, and bears two basic responsibilities: (1) conduct hearings consistent with due process to develop a complete evidentiary record to support proposed decisions, and (2) administer the CPUC decision-making process, including receiving and docketing formal filings, transcribing hearings, maintaining formal files, managing the CPUC Meeting agenda, preparing and serving CPUC decisions, and generally coordinating the decision-making process so that the CPUC satisfies the Open Meeting Act and other statutory requirements. Proceedings brought before Administrative Law Judges must be completed within statutorily defined time periods.

The CPUC also has enforcement (citation and revocation) programs to quickly deter misbehavior or illegal conduct by utilities and other regulated entities to ensure the employees of utilities and the public are properly protected from the hazards of providing utility and regulated transportation services. A cited entity may appeal a citation, and such appeals must be heard by an CPUC administrative law judge (ALJ) within timeframes set by statute or the CPUC. As part of its efforts to increase enforcement activity, the CPUC passed a new enforcement policy in 2020-21, delegating additional enforcement authority to the staff level, and increasing the likelihood of additional appeals.

Staff Comments. This proposal includes the following positions:

- One (1.0) permanent full-time Assistant Chief Administrative Law Judge (ACALJ)
- One (1.0) permanent full-time Staff Services Manager (SSM) I
- One (1.0) permanent full-time SSM II Four
- (4.0) permanent full-time Associate Governmental Program Analyst (AGPA)
- One (1.0) permanent full-time Legal Secretary

Under the direction of the Chief ALJ, the Assistant Chief Administrative Law Judges (ACALJ) directly supervise ALJs, manage designated portfolios of subject areas, and oversee relevant support functions in ALJ Division. In addition to the Chief ALJ, ALJ Division management currently includes seven ACALJs. The current seven ACALJs (six permanent authorized and one limited-term) manage 46 permanent authorized ALJs, 12 limited-term ALJs, and 8 retired annuitant (RA) ALJs working on a half-time basis. In addition to ALJ supervision, ACALJs oversee proceedings in designated subject areas and one or more administrative functions through staff managers in the division.

In the last five years, ALJ Division has experienced significant turnover due to recruitment and retention issues. In 2020-21 alone, there was a 20 percent turnover in rank-and-file ALJs, requiring extensive time spent on recruitment, hiring, and training. The PUC has also indicated that turnover amongst ALJs has approached 20 percent in recent years, which has impacted the division's ability to provide manage the numerous proceedings in which it is involved or oversees.

Within the last three years, 30 ALJs have been hired, resulting in an increased need for day-to-day management and review of work product, as well as increased time spent on hiring. As vacant positions have been filled within the Division, the shortage of management and support resources has resulted in the necessity for overtime hours to manage the workload.

The Administration included a version of this proposal as part of the 2020-21 budget, but it was withdrawn due to the unfolding pandemic. This proposal is basically identical to the withdrawn 2020-21 proposal.

Staff Recommendation: Hold Open.

Issue 5: Authorization for Permanent Funding of Key Limited-Term Positions in Support of Energy Policy Statutes

Governor’s Budget. The budget includes \$4,124,000 in ongoing funding from the Public Utilities Commission Utilities Reimbursement Account (Fund 0462) to convert 19.5 existing limited-term to permanent positions to continue implementing numerous statutes concerning microgrids, bioenergy, energy efficiency, and storage including interconnection of storage.

Background. In fiscal year 2019-20, the CPUC received authorization to hire 19.5 limited-term positions through June 30, 2022, to implement numerous statutes concerning microgrids, bioenergy, energy efficiency, and energy storage including the interconnection of storage. These statutes include:

Microgrids Statutes

- Chapter 566, Statutes of 2018 (SB 1339)—Supports microgrid commercialization by reducing barriers to microgrid deployment without shifting costs between ratepayers and giving highest priority to system, public, and worker safety.

Bioenergy Statutes

- Chapter 739, Statutes of 2018 (SB 1440)—Supports the development of a market for biomethane by requiring consideration of a biomethane procurement program for California’s gas Investor-Owned Utilities (IOUs).
- Chapter 598, Statutes of 2018 (AB 3187)—Supports the in-state production and distribution of biomethane by facilitating prudent and reasonable IOU infrastructure investments necessary for biomethane producers to interconnect to California’s gas pipeline system.
- Chapter 395, Statutes of 2016 (SB 1383)—Supports short-lived climate pollutant (SLCP) reduction efforts by encouraging the development of dairy biomethane pilot projects as an alternative to fossil natural gas procurement, as well as other related measures.
- Chapter 571, Statutes of 2016 (AB 2313)—Supports greenhouse gas (GHG) reduction efforts by ensuring continued monetary incentives for biomethane projects.
- Chapter 368, Statutes of 2016 (SB 859)—Supports biomass procurement from high hazard zone areas and inter-agency actions to mitigate wildfire threats to life and property.

Energy Efficiency (EE) Statutes

- Chapter 562, Statutes of 2018 (SB 1131)—Supports energy savings through the development of rules, review timelines, and metrics for customized projects.

Energy Storage Statutes

- Chapter 680, Statutes of 2016 (AB 33)—Supports research on potential long duration energy storage technologies to support reliability, reduce GHG emissions, and integrate renewable energy generation in the electric grid.
- Chapter 681, Statutes of 2016 (AB 2868)—Supports programs and investments to accelerate the procurement of distributed energy storage resources.

- Chapter 469, Statutes of 2010 (AB 2514)—Supports the establishment of energy procurement targets to achieve grid reliability, GHG reduction, and renewable integration, as well as a study to evaluate California’s energy storage procurement framework and mandate.

Staff Comments. The 2019-20 budget provided 31 limited term positions for a wide variety of energy-related statutes, including those described above. After the implementation of those positions, the administration has determined that twelve of the requested positions were genuinely limited term in nature. The remaining 19.5 positions requested here reflect workload that the PUC believes is likely ongoing in nature.

Staff Recommendation: Hold Open.

Issue 6: Communications Licensing and Compliance Section Permanent Position Authority

Governor’s Budget. The budget includes \$286,000 for fiscal year 2022-23 and \$284,000 ongoing funding from the Public Utilities Commission Utilities Reimbursement Account (Fund 0462) to convert two (2.0) temporary blanket positions to permanent in the CPUC Licensing and Compliance Section (L&C).

Background. The PUC Communications Division (CD) is responsible for seeing that telephone corporations (carriers) in California meet and comply with the obligation to provide California consumers safe and reliable telephone service at reasonable rates pursuant to Public Utilities (Pub. Util.) Code section (§) 451. Among other things, carriers must obtain the appropriate authority to operate in California and comply with all Pub. Util. Code provisions, and CPUC Rules, General Orders (GO), and Decisions applicable to providing approved services. The Licensing and Compliance Section was established within CD to implement and oversee all licensing and compliance related activities for telephone corporations in California.

Staff Comments. The PUC has indicated that several changes in the telecommunications space are driving increased workload for the Division. These include the sunset of PUC 710, which brought interconnected VOIP under the PUC’s jurisdiction, as well as an increase in telecommunications mergers and acquisitions. The PUC has met this workload by administratively creating two positions out of the Commission’s budgetary “blanket.” PUC has indicated that the workload is likely to be ongoing, and funding positions through the budget poses challenges for hiring and oversight. This is generally reasonable, but the Legislature should consider the extent to which the workload is likely to be both consistent and ongoing, and whether making the positions limited term to better assess ongoing workload is appropriate.

Staff Recommendation. Hold Open.

Issue 7: Information Technology Services Division—Security Enhancements

Governor’s Budget. The budget includes \$1,858,000 from various special funds (Distributed Administration) for ten (10.0) new permanent full-time positions in the Information Security Office (ISO) to improve its cyber security posture; consolidate enterprise information technology security, risk, and compliance activities; achieve compliance with State Administrative Manual (SAM) 5300 requirements; and address issues identified by both the State Auditor and by Independent Security Assessments performed by the California Military Department and California Department of Technology’s (CDT) Office of Information Security.

Background. Over the last five years, following the state’s “cloud first” policy, the CPUC has migrated multiple applications from CPUC-run data centers to cloud-hosted environments. The CPUC has also expanded to several additional new office locations and decentralized its operations and network. During the COVID response, the CPUC adapted to support a nearly 100 percent telework workforce and moved to an online meeting format for all public meetings, resulting in additional network complexity and an increased attack surface to be monitored.

In recent years, the world has experienced increasingly sophisticated cyber security attacks, especially as many state actors have started openly participating in developing and distributing new tools and methodologies. Attacks have escalated and been distributed through commercial products such as SolarWinds, Microsoft Exchange, and Pulse VPN which are all products the CPUC uses. New state policies and legislation such as the California Information Privacy Act must be evaluated and addressed.

Staff Comments. The PUC has indicated that updates to state security policies and standards, expansions of CPUC programs and staffing, migration of systems and data to cloud-hosted services, support for expanded telework and virtual meetings due to the COVID response, along with the escalation and increasing complexity of attack vectors, have outpaced the bandwidth of current CPUC security and network staff to keep pace. Additionally, the State Auditor, CDT’s Office of Information Security, and the California Military Department have all released security-related findings in recent audits and security assessments of the CPUC.

The PUC has indicated that this proposal would create a new Chief Security Officer position in the Information Security Office (ISO) to oversee security, risk, and compliance issues; increase the number of ISO resources from four (4.0) to ten (10.0) staff; and increase the number of Network and Security Section resources from five (5.0) to eight (8.0) staff. These resources will be responsible for maintaining the CPUC network in San Francisco, Sacramento, and Los Angeles; addressing security audit findings; and securing the enterprise.

The Administration included a version of this proposal as part of the 2020-21 budget, but it was withdrawn due to the unfolding pandemic. This proposal includes all of the resources originally requested in 2020-21, plus one additional position due to increased workload estimates.

Staff Recommendation: Hold Open.

Issue 8: Physical and Cyber Security Section

Governor’s Budget. The budget includes \$638,000 from the Public Utilities Commission Utilities Reimbursement Account (Fund 0462) for three permanent full-time positions to augment the capabilities of a CPUC safety and cybersecurity utility regulatory group in response to significant increases in global cyber threats and attacks, and in support of Chapter 327, Statutes of 2009 (SB 17).

Background. Cybersecurity broadly refers to the ability to protect information and communication systems and the data on those systems from damage or exploitation. Cybersecurity is foundational to modernizing the electrical grid by deploying "smart" devices, communication networks, and control systems. There are a variety of federal requirements around the cyber and physical security of utility infrastructure. Additionally, there are a number of state requirements related to cyber and physical security. Senate Bill 17 (Padilla), Chapter 327, Statutes of 2009 requires the development of Smart Grid Deployment Plans that include security considerations. Chapter 886, Statutes of 2018 (SB 327) and Chapter 860, Statutes of 2018 (AB 1906) mandated that, beginning in 2020, all manufacturers of connected devices in California must equip them with reasonable security features to protect data against unauthorized access, misuse, and destruction. Chapter 7, Statutes of 2020 (AB 89), the Budget Act of 2020, includes funding for the California Cybersecurity Integration Center.

In 2018, the CPUC Utility Cyber Security Branch integrated the Risk Assessment and Safety Advisory Section (RASA) to align cybersecurity efforts with ongoing global assessments of utility risks. These efforts included workshops in support of Public Safety Power Shutoff (PSPS), Emergency Response, Pole and Conduit Database, Physical Security threats, the State Emergency Plan, Wildfire Safety, the Safety Model Assessment Proceeding, the Risk Assessment Mitigation Phase (RAMP) and multiple exercises in conjunction with the IOUs, CalOES, the Department of Homeland Security, and the Department of Energy.

Staff Comments. For the CPUC to implement the requirements SB 699, the Physical and Cyber Security Section needs to review the physical security protocols that safeguard IOU information, equipment, IT infrastructure, and facilities. One of the core objectives is to ensure physical security standards supplement technology-oriented cybersecurity countermeasures by expanding exercises, increasing coordination with state and federal agencies, and providing more apparent assessment metrics to gauge progress.

The PUC has indicated that the requested positions would allow the Commission to be more proactive and engaged in cybersecurity issues at Investor-Owned Utilities, including through rate cases, related proceedings, compliance, and coordination efforts.

The Administration included a version of this proposal as part of the 2020-21 budget, but it was withdrawn due to the unfolding pandemic. This proposal includes all of the resources originally requested in 2020-21, plus one additional position due to increased workload estimates.

Staff Recommendation: Hold Open.

Issue 9: Strengthen Internal Operations Core

Governor’s Budget. The budget includes \$1,696,000 from various special funds (Distributed Administration) for position authority and funding to convert eight (8.0) existing full-time blanket positions, one (1.0) existing full-time intermittent position, and one (1.0) existing full-time temporary position to permanent to strengthen its internal operations core and improve support, oversight, and reporting of the Accounting Services Section, Human Resources Division, and Legal Division.

Background. The CPUC implements its mandated regulatory responsibilities and funds its operations by collecting user fees and surcharges from various carriers and providers. The CPUC also imposes fines and penalties (which are paid to the General Fund) for violations of Public Utilities Code and other applicable laws and regulations. In addition, the CPUC manages many utility related projects mandated by the CPUC to improve and deliver safe, affordable, and efficient utility services to Californians through reimbursable contracts and, in turn, the CPUC receives reimbursements from these providers. All of this required careful financial management and controls.

The Director of the HR Division, which is currently an administratively-created position, is responsible for all policy development, administration, and maintenance and overall HR operations of the CPUC’s workforce. The HR Division plans, directs, and organizes all issues related to employee salaries and benefits, job classifications, exams, recruitment, classification and hiring, and position control, as well as performance management, health and safety, learning and development, diversity and equity initiatives in the employee life cycle, and labor relations.

Prior to February 2020, the CPUC had one attorney dedicated to employment issues. That attorney often worked 50 hours per week advising managers on numerous personnel issues, as well as the Equal Employment Opportunity (EEO) Office and the Department of Fair Employment Housing (FEHA) on discrimination, harassment, and retaliation complaints; monitoring employment related investigations; advising the CPUC HR Division on medical and reasonable accommodations issues; providing in-person training to CPUC managers; and overseeing the work performed by outside counsel on state and federal court litigation. An additional attorney position was created administratively in 2020 to address workload issues.

The CPUC engages in significant public service contracting, awarding millions of dollars each year to outside consultants. Every valid public contract is required to follow state contracting rules, including the Public Contract Code, State Contracting Manual, and State Administrative Manual (SAM), as well as the CPUC’s own internal policies and procedures. A 2016 state audit recommended the CPUC change the way it oversees its public contracting practices to ensure it receives the best value for its services contracts. It specifically found “that the CPUC often does not follow state requirements or best practices when it issues and oversees its own contracts for services” and fails to ensure that it obtains the best value in cases where competitive bidding is not required. As a result, the CPUC administratively established an attorney position to handle increased contracting workloads.

Staff Comments. Given the increase in workload at the PUC in recent years, driven by legislation, market conditions, wildfires, and other external factors, additional resources are generally reasonable. PUC has already administratively created most of the resources requested here. While keeping those positions within the Commission’s budgetary “blanket” is an option, it creates issues around oversight and administrative / overhead costs. As such, some level of permanent resources is reasonable. This request is an opportunity for the Legislature to assess the Commission’s overall administrative organization and the appropriate level of permanent resources needed to support that organization.

Staff Recommendation: Hold Open.

Issue 10: Transportation Licensing and Enforcement Branch

Governor’s Budget. The budget includes \$2,264,000 from the Public Utilities Commission Transportation Reimbursement Account (Fund 0461) including \$1,482,000 for fiscal year 2022-23 and \$1,473,000 ongoing for eight (8.0) new permanent full-time positions, and position authority and funding to convert one(1.0) existing full-time blanket position to a permanent position; \$673,000 one-time funding for contracts and equipment; and \$109,000 for fiscal year 2022-23 and ongoing for subscription licensing costs for the Consumer Protection and Enforcement Division transportation branch.

Background. The CPUC has regulatory authority over passenger transportation safety, including licensing, rate regulation, enforcement, and rulemaking authority over passenger carriers that provide prearranged transportation. Public Utilities (Pub. Util.) Code §5352 directs the CPUC to fulfill a variety of responsibilities, including, among other things, timely enforcement against illegal carriers, education and outreach to local law enforcement agencies and stakeholders, timely processing of permit applications, electronic filing of permit documents, and dedicated staff to answer the carrier assistance hotline.

The Transportation Enforcement Branch (TEB) achieves its primary mission of transportation public and passenger safety primarily through its safety assurance functions. Safety assurance includes investigating complaints, performing field checks for compliance, conducting joint inspections with law enforcement partners (e.g., local law enforcement, airport ground transportation enforcement, the California Highway Patrol, and District Attorney offices), taking enforcement action, and ensuring corrective actions for documented compliance and safety issues.

The Transportation Licensing and Analysis Branch (TLAB) performs transportation carrier licensing and analysis functions. The TLAB Analysis section provides technical and advisory support to Commissioners, Administrative Law Judges, and all levels of agency management on transportation matters. The TLAB Licensing section analyzes carrier applications, manages changes to carrier operations, communicates with carriers, and issues authorities, certificates, and permits to carriers that meet state requirements.

Staff Comments. Beginning in March 2020, passenger demand reportedly dropped by more than 90 percent across the entire passenger carrier industry. In addition, California experienced an unprecedented 20 percent decline in legally permitted carriers, as many carriers suspended operations or left the industry completely. As COVID restrictions continue to change across the state, Commission staff has observed increasing passenger demand and expects the demand to continue at an increasing pace. Along with this trend, staff and law enforcement partners are already seeing, statewide, an increasing number of illegal operations, more carriers re-entering the industry, and new carriers applying for operating permits for the first time.

Transportation Network Companies (such as Uber and Lyft) and autonomous vehicle (AVs) companies continue to evolve their products, business models, technologies, and policies. They

have significantly more capacity than the CPUC or other public agencies to conduct analysis and effectively use data to illustrate their positions both in meetings and in formal comments submitted in the course of CPUC rulemakings.

Both of these trends suggest that additional staff at the PUC is reasonable. The Administration included a version of this request in the 2020-21 budget, which was withdrawn due to the evolving covid-19 pandemic. That original request was for 14 perm positions. This request reduces that by five positions but includes additional contracts, equipment, and license costs due to increased technical workload.

Staff Recommendation: Hold Open.

Issue 11: Utility Audit Requirements

Governor’s Budget. The budget includes trailer bill language making changes to the PUC’s audit requirements for regulated utilities, and changes to the approach those audits must follow.

Background. The Utility Audits Branch (UAB) performs a variety of external audits and attestation engagements of energy, telecommunication, and water and sewer utility companies under the general authority outlined in the Public Utilities (PU) Code Sections 314, 314.5, and 314.6. The UAB performs most of its audit services for purposes of assisting the CPUC in safeguarding various ratepayer funded programs and protecting ratepayer’s interests. The UAB performs most of its audits and attestation engagements in accordance with generally accepted government auditing standards (GAGAS) which requires that the Branch plans and performs the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for any findings and conclusions based on audit objectives.

The Branch performs a variety of audits across a number of regulated entities. These include:

- Energy Procurement Quarterly Compliance reports, related to energy procurements by investor-owned utilities.
- Balancing Account audits to ensure revenue collection from utility ratepayers is appropriate and consistent with PUC direction.
- Energy Efficiency program audits.
- Audits of water, sewer, and communication utilities.
- Audits of utility service providers to ensure that the utilities are conforming with diversity requirements per Utility Supplier Diversity Program General Order (GO) 156.

Staff Comments. Under current law, CPUC is required to audit utilities for regulatory purposes within certain schedules, depending on utility type, and number of households served. Current law also puts certain requirements on audits of balancing accounts and allows CPUC to prioritize audits based on certain criteria. CPUC has indicated that the current static time period within which CPUC needs to conduct financial audits of all the stationary utilities is infeasible, would require a massive increase in auditing staff and resources, and does not conform with modern financial auditing practices which is to conduct these types of audits based on a risk-focused approach of the regulated entities. In this case, the stationary utilities.

The proposed trailer bill language streamlines or eliminates much of these requirements in favor of “risk-based” approaches that can be applied beyond the current criteria. While some streamlining is likely desirable, the Legislature may want to consider how far that streamlining should go, and how the CPUC’s audit functions fit into the broader regulatory role the Commission plays.

Staff Recommendation: Hold Open.