



California Public Utilities Commission



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R.19-01-011 Phase II Staff Proposal (DRAFT)

CPUC ENERGY DIVISION STAFF

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1 EXECUTIVE SUMMARY

On January 31, 2019, in response to the passage of Senate Bill (SB) 1477 (Stern, 2018)¹ and Assembly Bill (AB) 3232 (Friedman, 2018),² the California Public Utilities Commission (CPUC) initiated Rulemaking (R.) 19-01-011 to set in motion the development of new regulations for the decarbonization of buildings in California. The quasi-legislative proceeding's preliminary scoping memo³ outlined four general categories of issues to address: (1) Implementing SB 1477, (2) Potential pilot programs to address new construction in areas damaged by wildfires, (3) Coordinating with Title 24 Building Energy Efficiency Standards and Title 20 Appliance Efficiency Standards, and (4) Establishing a Building Decarbonization Policy Framework. A formal scoping memo issued on May 17, 2019⁴ affirmed the four issue areas identified in the preliminary scoping memo and posed questions for parties to comment on regarding the implementation of SB 1477 (i.e., Phase I considerations).⁵

A Staff Proposal composed jointly by CPUC and California Energy Commission (CEC) staff was entered into the formal record of R.19-01-011 by an Administrative Law Judge's ruling issued on July 16, 2019.⁶ Two dozen separate parties filed either comments or reply comments in response to the Staff Proposal. On February 12, 2020, Commissioner Liane Randolph issued a Proposed Decision (PD)⁷ that would create two new pilot programs: the Building Initiative for Low-emissions Development (BUILD)

¹ See: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180SB1477.

² See: http://leginfo.legislature.ca.gov/faces/billNavClient.xhtml?bill_id=201720180AB3232.

³ See: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M264/K629/264629773.PDF>, pp.7-10.

⁴ See: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M290/K324/290324466.PDF>.

⁵ A subsequent ruling amended the scoping memo to include additional questions for record development. See: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M309/K790/309790749.PDF>.

⁶ See: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M309/K714/309714196.PDF>.

⁷ See: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M326/K933/326933578.PDF>.

Program, which would be administered by the CEC and provide incentives for the deployment of near-zero-emission building technologies in new residential housing, and the Technology and Equipment for Clean Heating (TECH) Initiative, which would be implemented by a third party selected via competitive solicitation and advance California’s market for low-emission space and water heating equipment through market development, consumer education, contractor and vendor training, and the provision of upstream and midstream incentives. The PD was revised in response to party comments and formally adopted on March 26, 2020 as Decision (D.) 20-03-027.⁸

This new Staff Proposal picks up where D.20-03-027 left off. First, the CPUC’s Energy Division staff (Staff) addresses incentive layering, which was the subject of a directive issued in D.20-03-027. Second, Staff addresses post-wildfire reconstruction, which was previously established as the focus of Phase II of R.19-01-011. Finally, Staff addresses the subject of baseline allowance modifications, which was originally envisioned as a Phase IV consideration of R.19-01-011.⁹ Each of these topics is addressed individually in three separate sections of this Staff Proposal. A summary of Staff’s recommendations regarding each topic is provided below.

1.1 INCENTIVE LAYERING

Staff recommends layering incentives in such a way that the cost of an appliance to the customer is sufficient to encourage fuel substitution. Energy efficiency (EE) incentives would be applied to particular types of appliances first, establishing an incentive “baseline” from which other programs would layer additional incentives accordingly. Depending on market conditions, it may or may not be appropriate to

⁸ See: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M331/K772/331772660.PDF>.

⁹ While no Scoping Memo issued to date uses the term “Phase IV,” Staff uses the term in this Staff Proposal to refer to the fourth category of issues to address pursuant to the Scoping Memo in R.19-01-011.

layer on additional incentives. If additional incentives for a particular type of appliance are not appropriate, funds could shift to serve a complementary purpose, so long as that fund shift was consistent with corresponding program rules. In order to further facilitate building decarbonization, non-jurisdictional entities would need to adjust any complementary incentive offerings and program rules to what local conditions demand.

Staff further recommends an evaluation formula that attributes program success proportionally by the total incentive amount contributed to a single appliance. In other words, if the TECH Initiative contributes X% of total incentives applied to a particular appliance, X% of the resulting energy savings, greenhouse gas (GHG) reductions, etc. should be attributed to the TECH Initiative. This formula would not take into consideration any incentive provided for a purpose other than reducing the price of the appliance itself. Incentives not to be included under this formula include such things as CTA-2045 Universal Communication Modules (UCMs), thermostatic mixing valves, panel upgrades, installation costs, and bill credits.

Finally, Staff recommends that the new appliance tracking database to be developed by the TECH Initiative implementer be used to track which specific appliances are receiving which incentives. Contractors would receive training through the TECH Initiative in how to input data into the database and funds to contractors could be conditioned on proper data input. This information would then be used to ensure accurate evaluation and provide insight into where each appliance is being installed. To ensure coordination across programs and between incentive programs that are not subject to CPUC oversight, the TECH Initiative implementer would be tasked with developing a memorandum of understanding (MOU) to be entered into by all relevant entities and program administrators.

1.2 POST-WILDFIRE RECONSTRUCTION

Staff recommends that a new statewide natural disaster recovery rebuild program, the Wildfire and Natural Disaster Resiliency Rebuild (WNDRR) program, be created. The WNDRR program would provide incentives to help single-family homeowners and multi-family properties impacted by a natural disaster rebuild all-electric in alignment with the state's long-term climate and energy goals. Staff recommends program incentives be administered in a simple tier system that values the modeled GHG savings over 30 years using the GHG values adopted in the Avoided Cost Calculator (ACC). Staff also recommends a kicker incentive be provided for buildings pursuing Passive House certification in order to better understand how building design can contribute to California's short- and long-term climate, energy, and resiliency goals.

Staff recommends that the WNDRR program be administered by the three large electric investor-owned utilities (IOUs) – Southern California Edison (SCE), Pacific Gas and Electric (PG&E), and San Diego Gas and Electric (SDG&E) – at a community level in partnership with local jurisdictions, community-based organizations, and a technical third-party implementer in each IOU's respective service territory. This program administration model has proven to be effective based on the recovery efforts following wildfires in 2017 and 2018.

Finally, Staff recommends that the WNDRR program be funded at \$5 million per year for 10 years through natural gas Cap-and-Trade proceeds akin to the BUILD Program and TECH Initiative. Further, Staff recommends that SCE serve as the administrator of the WNDRR funds, in order to achieve administrative efficiency across building decarbonization programs.

1.3 BASELINE ALLOWANCE MODIFICATIONS

Staff recommends requiring California's three large electric IOUs to each introduce a new baseline allowance for customers who install electric water heating equipment. This baseline allowance would be finalized in each IOU's next Phase II General Rate Case (GRC) filing or Rate Design Window (RDW) filing depending on where each IOU is in its current GRC cycle. However, because of the length of time that it would take before each IOU's next Phase II GRC filing or RDW filing is approved, Staff recommends requiring a more immediate intervention to provide customers who install electric water heating equipment with a stopgap baseline allowance in the near-term.

To help offset any cost shifting that might occur as a result of the new baseline adjustment, as well as to help correct distortions to the existing all-electric baseline allowance and better conform with statutory requirements, Staff recommends disallowing customers who supplement their electricity usage with propane from qualifying for the all-electric baseline allowance unless they are otherwise eligible due to installation of electric space heating equipment. This change would be implemented prospectively and be based on a customer pre-screening process. Low-income customers of the dual fuel IOUs would be exempt from the prospective disallowance.

The IOUs would implement all recommended changes via a Tier III advice letter (AL) that would be required to be filed no later than one month from the date of adoption of a CPUC decision in Phase II of R.19-01-011. In recognition of the fact that some IOUs are currently making modifications to their billing systems, Staff's recommendation is to allow flexibility in how the recommended changes are implemented, so long as they are implemented expeditiously and in good faith.

2 INCENTIVE LAYERING

Since the passage of SB 1477 in 2018, the CPUC created or modified several different regulatory programs to encourage building decarbonization by providing incentives for heat pump appliances.¹⁰ As of July 1, 2020, the CPUC has either approved or is reviewing approximately \$435 million in incentives across 16 different programs for heat pump water heaters (HPWHs), heat pump heating, ventilation, and air conditioning (HVAC) systems, and related devices that enable these technologies to achieve full functionality.¹¹ These programs have different funding sources, design requirements, goals, and evaluation methodologies, making coordination across programs a challenge.

Acknowledging the challenge of coordinating across programs, the CPUC in D.20-03-027 directed Staff to hold a workshop and “produce a staff proposal with a framework for how to address funding when combining incentives from separate program budgets.”¹² On June 30, 2020, Staff held the required workshop to address various aspects of incentive layering. Stakeholders that presented at the workshop included panelists representing industry experts (Gridworks, Recurve, and New Buildings Institute), non-IOU program administrators (East Bay Community Energy, Bay Area Regional Energy Network, and Sacramento Municipal Utilities District (SMUD)), and the large IOUs (SCE, Southern California Gas Company (SoCalGas), PG&E, and SDG&E).

¹⁰ An explanation of heat pump technology can be found at <https://www.energy.gov/energysaver/heat-and-cool/heat-pump-systems>.

¹¹ See: <https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=6442465700>.

¹² D.20-03-027, p.86.

2.1 BACKGROUND

The numerous CPUC regulatory programs intended to encourage building decarbonization are spread across four distinct program categories. The first category, “Energy Efficiency,” includes all measures approved or pending for inclusion in each IOU’s EE portfolio that encourage adoption of high efficiency electric space and water heating appliances (e.g., SCE’s midstream HPWH incentives). The second category, “Grid Optimization,” includes all measures approved or pending that facilitate load shifting in HPWHs (e.g., PG&E’s proposed WatterSaver program). The third category, “Community Support,” includes all measures approved or pending that enable disadvantaged communities that rely on propane and wood fuel to switch to cleaner, more affordable electric alternatives (e.g., the San Joaquin Valley (SJV) Disadvantaged Communities pilot programs). The final category, “Emissions Reduction,” includes all measures approved or pending that focus foremost on driving down building sector GHG emissions (e.g., the BUILD Program and TECH Initiative). Table 1 summarizes each of the four program categories, their goals, and their funding source.

<u>Program Category</u>	<u>Goal</u>	<u>Funding Source</u>
Energy Efficiency	Energy Savings	Energy Efficiency Portfolio Funds
Grid Optimization	Load Shifting	Public Purpose Program Funds
Community Support	Health and Comfort	Public Purpose Program Funds
Emissions Reduction	GHG Minimization	Gas IOU Cap-and-Trade Funds

Table 1: Program Categories, Goals, and Funding Sources

Each building decarbonization incentive dollar is provided at a different place in the supply chain. “Upstream” incentives are “program elements aimed at encouraging manufacturers to make the most efficient equipment available at competitive prices.”¹³ “Midstream” incentives are “program elements that provide incentives to wholesale distributors, retailers, e-commerce companies and/or contractors to stock and/or sell more efficient products.”¹⁴ “Downstream” incentives are program elements that are provided to the end use customer. Table 2 illustrates what part of the supply chain various building decarbonization programs target.

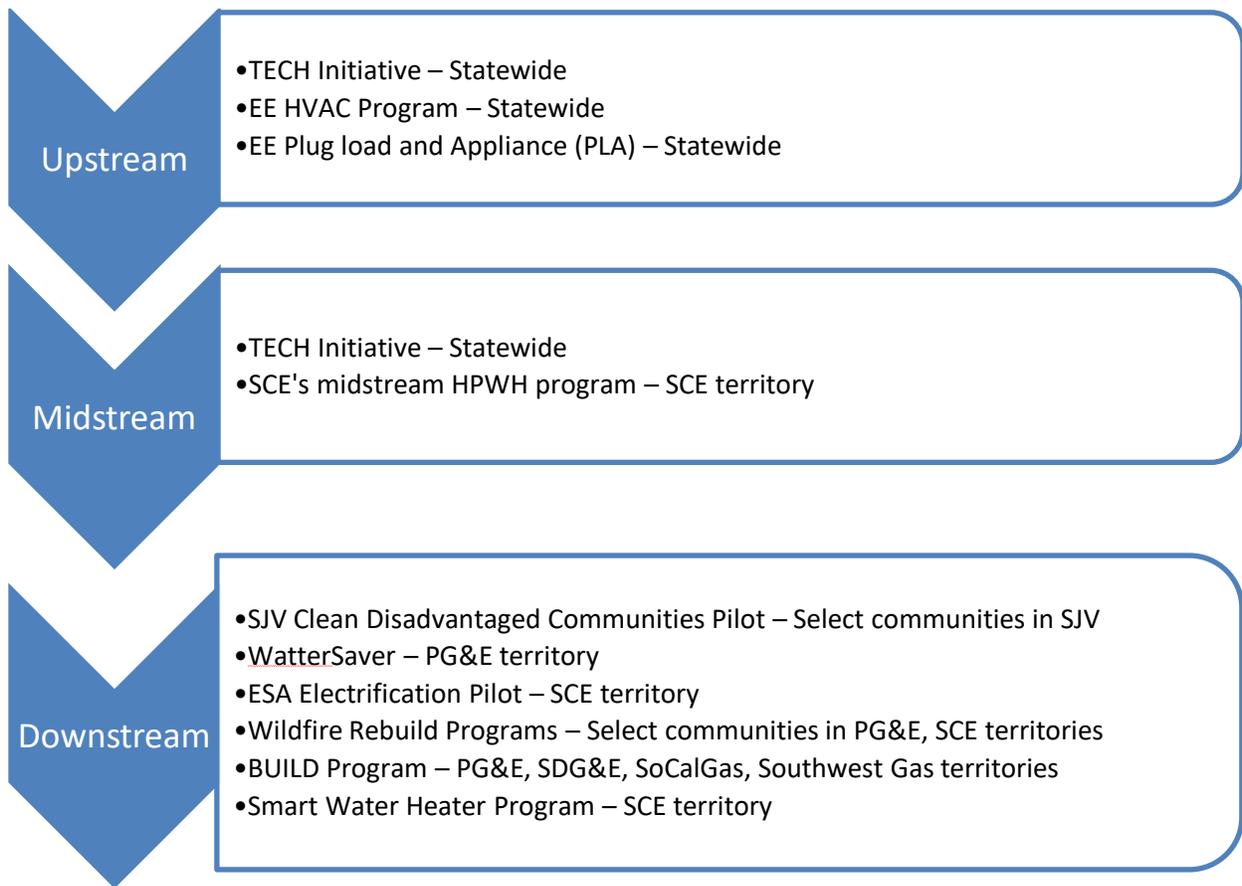


Table 2: Building Decarbonization Programs with CPUC Oversight

¹³ D.20-03-027, p.83.

¹⁴ *ibid.*

Another dimension to incentive layering is regionally based, and the overlapping territories of the program administrators. For example, many Californians live in the territories of an IOU, a Regional Energy Network (REN),¹⁵ and a Community Choice Aggregator (CCA).¹⁶ Other Californians may receive electrical service from a publicly owned utility (POU) while receiving natural gas service from an IOU (e.g., City of Sacramento residents) or vice versa (e.g., City of Long Beach residents). Each region of the state has a unique combination of building decarbonization programs available to its residents. Many of these programs are not subject to CPUC jurisdiction, thus adding even greater complexity to the question of incentive layering. Table 3 lists the incentives that are currently offered or being considered by various CCAs.

CCA	Programs Offered
CleanPowerSF	Regional HPWH incentives, upcoming EE programs
East Bay Community Energy	Regional HPWH incentives, Reach Codes, all-electric design assistance, induction cooking, P4P focused on EE / flexible load
MCE	Regional HPWH Incentives, LIFT program, Advanced Energy Rebuild Napa
Peninsula Clean Energy	Reach Code assistance, new construction electrification, HPWH rebates, Innovation grants
Redwood Coast Energy Authority	HPWH rebates, space conditioning HP rebates
San Jose Clean Energy	HPWH rebates, service panel rebates, induction cooking, Reach Codes
Silicon Valley Clean Energy	HPWH rebates, Showcase program, Innovation grants, community decarbonization planning, Reach Codes
Sonoma Clean Power	Advanced Energy Rebuild / Build, Lead Locally, GridSavvy, Reach Codes, Induction Cooking
Monterey Bay Community Power	Reach Codes, MUD Electrification Grant Program

Table 3: CCA Building Decarbonization Programs¹⁷

¹⁵ A REN is a collaboration of local governments that organizes itself to become a program administrator of customer demand side programs, as directed in CPUC D.12-05-015. See: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M034/K299/34299795.PDF>.

¹⁶ A CCA is any individual city, county or city and county, whose governing board elects to combine the loads of its residents, businesses, and municipal facilities in a communitywide electricity buyers program, or any group of cities, counties, or cities and counties, who governing boards have elected to combine loads of their programs, through the formation of a joint powers agency. See PUC § 331.1: https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=331.1.&lawCode=PUC.

¹⁷ From presentation of East Bay Community Energy given at June 30 workshop on Incentive Layering. Presentation available at <https://www.cpuc.ca.gov/General.aspx?id=6442465386>.

Tables 2 and 3 are not necessarily complete lists of programs offering incentives for heat pump appliances, and the programmatic details of some of these programs are still to be determined. The current status of the select key programs are as follows:

- TECH Initiative: A Request for Proposals (RFP) was issued and proposals were received on August 18, 2020.
- BUILD Program: CEC and CPUC staff held a joint implementation workshop on June 15, 2020. On July 24, 2020, the CEC submitted its initial implementation plan to the CPUC for approval.
- Statewide EE HVAC Program: SDG&E is currently considering proposals that were received through an RFP process.
- Statewide EE Plug Load and Appliance Program: SDG&E is currently considering proposals that were received through an RFP process.
- Self-Generation Incentive Program (SGIP): Staff will issue a Staff Proposal in Fall 2020 on how to incorporate HPWHs into the SGIP program.
- WatterSaver Program: PG&E has requested approval via AL 5731-E. Approval is pending.
- 2021-2026 ESA Electrification Pilot: SCE proposed in their application for the Energy Savings Assistance Program. Approval is pending.

2.2 CHALLENGES

The key challenge of incentive layering is what rules or guidelines are appropriate in order to manage the different funding streams that incentivize heat pump appliances and related devices while creating a seamless customer experience. Meeting the state's

goals for building decarbonization is daunting, given the many market barriers to retrofitting natural gas furnaces and water heaters to units using heat pump appliances. Currently, heat pump appliances are often more expensive than their natural gas counterparts and installing them can add significant cost. For example, many older residential buildings found in the coastal climates of California will likely require an electrical service and/or electrical panel upgrade to accommodate heat pump appliances. This upgrade can range in costs from the low thousands of dollars to tens of thousands of dollars depending on the electrical service characteristics and local ordinances that may require undergrounding.

At the June 30 incentive layering workshop, industry experts were invited to present their thoughts on the challenges inherent in incentive layering, evaluation and attribution, and resource sharing. In presenting their joint proposal for incentive layering, the IOUs outlined the challenge as such:

Problem Statement

- TECH Initiative and BUILD Program overlap with other residential demand side management (DSM) programs and incentives, which causes market confusion.
- Potential to overpay projects if combined program incentives exceed optimal incentive levels.
- Potential to under-serve greater number of customers if programs are unable to extend customer reach by layering.
- Each program needs to abide by its own rules and legislative mandates that could inhibit layering.

Goals

- Maximize GHG reductions;
- Maximize customer reach;
- Simplify customer participation in multiple programs;

- Identify and eliminate duplicative incentives; identify opportunities for complementary offerings and/or incremental incentive benefits; and
- Identify and eliminate incentives when not needed, example eliminate panel upgrade incentive if the incentivized heat pump is installed along with solar system.

Recommendations

- Develop framework focused on continuous program coordination, while preserving programs' existing requirements;
- Leverage/enhance statewide or national existing inventory databases for tracking;
- Leverage a “partnership” agreement concept across programs;
- Explore long-term, consolidated market transformation incentive framework (e.g., California Solar Incentive framework);
- The priority for incentives should come from upstream and midstream sources, as they require less effort from consumers; and
- The incentive for the customer for all expenses may exceed the cost of the incumbent technology but must still leave some cost burden to the customers.

The IOUs presented definitions for the different types of incentive layering:

- **Complementary Incentives:** A layered or overlapping incentive that provides incremental value to ratepayers or society even when an existing incentive or market development activity is already being provided. An example of this can be an appliance that has already been reduced in price through an upstream incentive then has its installation cost covered at the downstream end. This is the ideal form of incentive layering.

- **Layered/Overlapping Incentives:** Financial or non-financial incentives being offered to the same market segment, customer, or technology measure at the same time. An example of this can be one appliance that is partially paid for by an IOU, and then gets an additional incentive from a regional implementer such as a CCA. This is appropriate in some cases when it overcomes market barriers, and not in others.
- **Duplicative Incentives:** Incentives that provide no incremental value over another incentive or market development activity that is already being provided. This is the type of incentive layering that should be avoided.¹⁸

The IOUs provided an illustrative example of how incentive stacking might work, which is reproduced below as Table 4:¹⁹

¹⁸ Presentations from the June 30 workshop are available here, IOU slides are 103 – 118:
https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/Energy_Programs/Incentive%20Layering%20Workshop_06302020_Final.pdf.

¹⁹ Slides from June 30 workshop on Incentive Layering, available at
<https://www.cpuc.ca.gov/General.aspx?id=6442465386>, Slide 112.

Cost	Incentive Layer	Program	Incentives For:	Potential Incentive Amount	Benefit Claim (% of Share)
Smart Controls \$400	4	ESP&IP	Smart Controls Only	\$300?	<ul style="list-style-type: none"> • Peak Demand Reduction • GHG Reduction
Labor \$700-\$1,000	3	SGIP	Equipment and Labor	\$1,700?	<ul style="list-style-type: none"> • Peak Demand Reduction • GHG Reduction
Wiring \$300-\$1,000					
Panel Upgrade \$3,000-\$4,000	2	TECH Pilot	Equipment, Labor, and Panel Upgrade	\$2,500?	<ul style="list-style-type: none"> • GHG Reduction
50G HPWH \$1,500					
\$6,000 Total Installed Cost			Potential Incentives <= \$5,000 Customer Installed Cost after Incentives >= \$1,000		

Table 4: Retrofit Heat Pump Water Heater, Single-Family Example

Other panelists expressed a range of concerns about the availability of multiple incentives. According to the panelist representing Recurve, program implementers may be discouraged from layering incentives from multiple sources due to existing program and cost-effectiveness rules. According to their analysis, “As currently structured, general energy efficiency programs such as Advanced Home Upgrade (AHUP) may not benefit from collaboration with TECH efforts. Programs like AHUP that solicit or augment funding from external sources (including from participants) face a penalty on their total resource cost ([TRC]) performance metric,” due to the requirement that, “the cost of all the equipment would count towards the full measure cost and compare to the bill savings benefits.”²⁰ The panelist representing Gridworks pointed out the lack of qualifying criteria for decarbonization efforts, the number of program administrators, similar programs in the market, and different lending terms from utilities and banks as among the complicating factors in the current and emerging heat pump marketplace in

²⁰Comments of Recurve Analytics, Inc. to Proposed Decision Establishing Building Decarbonization Pilot Programs, p.2. See <https://docs.cpuc.ca.gov/SearchRes.aspx?DocFormat=ALL&DocID=329232444>.

California.²¹ The panelist representing BayREN pointed out the need to create an environment of “flexibility and collaboration” and streamlined applications.²² All panelists agreed that incentives need to be easily accessible for the contractors, especially those downstream. Several panelists expressed a desire for a single application in order to take advantage of multiple incentives.

2.3 PROPOSAL

Staff’s incentive layering recommendations are premised on the belief that building decarbonization efforts will ultimately be unsuccessful unless the total cost to a customer for switching from a natural gas appliance to an electric heat pump appliance is equal to or less than the cost of replacing a natural gas appliance with another natural gas appliance. As such, the objective of an incentive layering framework should be to coordinate incentives across programs in order to reduce both appliance and installation costs to a level at which customers are willing to pursue fuel substitution in meaningful numbers. The end goal should be to transform the California market for heat pump appliances and related devices such that incentives can be minimized or eliminated entirely over time.

Determining what incentive levels are appropriate to encourage fuel substitution will require a significant amount of experimentation and flexibility in the years ahead.

²¹Gridworks’ presentation is available at, slide 16:

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/Energy_Programs/Incentive%20Layering%20Workshop_06302020_Final.pdf, Slide 16.

²² BayREN’s presentation is available at:

https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy_-_Electricity_and_Natural_Gas/Energy_Programs/Incentive%20Layering%20Workshop_06302020_Final.pdf, pp.90-101.

In SCE's service territory, customers already have access to a \$1,000 HPWH mark-down through a midstream EE incentive. As a result of the \$1,000 incentive, an SCE customer can, for example, purchase an A.O. Smith Signature Premier 50-gallon HPWH through Lowe's for under \$200. This low appliance price begs the question as to whether it would be appropriate to provide any further incentive for the same appliance, especially given the fact that a federal tax credit of \$300 is currently available to homeowners who install an ENERGY STAR certified HPWH at their principal residence.²³ If the \$1,000 EE HPWH incentive remains in place beyond 2020, it may not be appropriate for another program (e.g., the TECH Initiative, SGIP, etc.) to offer any additional appliance incentive to the customer. However, if the Statewide EE HPWH incentive is lowered, providing an additional incentive from another program may be entirely justified.

Moving forward, Staff recommends that EE incentives be the "baseline" by which other incentives for heat pump appliances are determined. In other words, EE incentives for heat pump appliances should be set at levels that are appropriate for each IOU's EE portfolio, and other programs can either augment or eliminate incentives for the same appliances based on what price signal is likely to encourage fuel substitution. For example, a generous EE HPWH incentive may result in the TECH Initiative not needing to provide any incentives for HPWH equipment and instead reprioritizing its funds to provide a greater appliance incentive for heat pump HVAC equipment or more contractor and vendor training.

When determining incentive amounts, programs subject to CPUC oversight should not take into consideration any currently existing incentives provided for heat pump appliances and related equipment by programs and/or entities that are not

²³ See:

https://www.energystar.gov/about/federal_tax_credits/non_business_energy_property_tax_credits.

subject to CPUC jurisdiction. Rather, non-jurisdictional entities' incentives should adjust to the suite of incentives approved by the CPUC in a way that addresses local needs. For example, a CCA in the Bay Area, where air conditioning appliance adoption is low and most homes are not equipped with a 200 amp panel, may wish to not offer any appliance incentive and instead incentivize panel upgrades that would facilitate the installation of more electric appliances. Alternatively, an Air Quality Management District (AQMD) may wish to encourage building decarbonization by focusing solely on replacing gas cooktops with induction alternatives, which have received less attention from the CPUC vis-à-vis electric space and water heating equipment. These kinds of incentive adjustments are arguably already underway, with SMUD recently announcing that it would be suspending its HPWH incentive program and expressing a desire for TECH Initiative and SGIP funds to fill in the gap caused by the local program's suspension.²⁴ Incentive amounts and program rules should be coordinated across programs to ensure that market rate customers pay for a portion of the appliance and installation costs. Low-income and equity programs can cover 100% of appliance and installation costs when it is deemed appropriate by the program and the CPUC.

Staff proposes a simple formula for attributing demand savings, energy savings, GHG emissions reductions, and any other metrics that may be ascribed to the various programs providing incentives for the same appliance. Rather than propose a unified evaluation protocol for all the different incentive funding sources, each of the various programs providing incentives for the same appliance should evaluate each portion of their funding as they otherwise would. The difference is that the evaluation should only attribute the percentage of savings matched to the percentage of incentive the program

²⁴ See Slide 48 of the SGIP HPWH Part 2 Workshop held on May 7, 2020: https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/Utilities_and_Industries/Energy/Energy_Programs/Demand_Side_Management/Customer_Gen_and_Storage/SGIP.HPWH.Workshop.Part2.pdf.

contributed. For example, a HPWH that might receive a \$500 incentive from an EE program, a \$200 incentive from the TECH Initiative, and a \$100 incentive from SGIP would attribute 62.5% of any applicable savings to the EE program, 25% to the TECH Initiative, and 12.5% to SGIP. Appliance incentives that are provided by programs not subject to CPUC jurisdiction should also be factored into any such formula, as should any applicable tax credits. For programs such as the Energy Savings Assistance Program or the SJV Disadvantaged Communities pilot programs that may provide a 100% subsidy for a heat pump appliance for qualified customers, the evaluation and attribution formula should attribute the full cost of the appliance to the program providing the subsidy after accounting for any other incentives that may have reduced the cost of the equipment prior to installation.

Incentives for improving performance, functionality, or feasibility of the appliance should not be factored into the evaluation and attribution formula. More specifically, incentives for ancillary costs such as CTA-2045 UCMs, thermostatic mixing valves, electrical panel upgrades, and installation costs should be treated separate from any incentives for lowering the selling price of the heat pump appliance itself. Similarly, BUILD Program incentives, which are intended to encourage construction of all-electric new residential housing, should also be treated separate from appliance incentives. Rate incentives related to heat pump appliances, such as those adopted in the SJV Disadvantaged Communities pilot programs and the proposed PG&E WatterSaver program, should be treated separately, as well.

To ensure the accuracy of attribution and evaluation, Staff recommends relying on a new database to be developed by the future TECH Initiative implementer. Coordination of marketing across programs was a mandated requirement of the TECH Initiative implementer per D.20-03-027, while other incentive layering and program

coordination is among the discretionary tactics.²⁵ The RFP for the TECH Initiative implementer states, “In order to track appliances as they move through the supply chain, bidders should propose a method for tracking appliances that the TECH Initiative incentivizes, such as a database of appliance serial numbers.” This database will be able to track an appliance, using its serial number, from where it is manufactured through the supply chain to where it is installed. This database can be used by all market actors to track market activity and incentives that the appliance receives. The TECH Initiative’s contractor training component can teach contractors how to input information into the new database for tracking additional downstream incentives, as well as any applicable federal tax credits, and contractor incentives can be made to be contingent on data input.

Staff recommends that the future TECH Initiative implementer be tasked with developing an MOU to ensure coordination with incentive programs run by entities that are not CPUC jurisdictional. The MOU would be an agreement to avoid duplicative incentives and ensure further accuracy of attribution and evaluation by sharing data and creating shared program applications. An MOU would be signed between CCAs, AQMDs, RENS, IOUs, POU, and any other program implementer such as the TECH Initiative implementer. While the CPUC will not be able to compel all of these various entities to enter into an MOU, they should all be inclined to cooperate, as they are all working toward similar objectives and all share a desire to accurately evaluate their respective programs.

Finally, Staff notes that not all of the proposed recommendations are necessarily appropriate to adopt in the context of R.19-01-011. To the extent that this Staff Proposal addresses topics specific to EE, the EE proceeding – R.13-11-005 – may need to adopt

²⁵ D.20-03-027, Section 5.2.3, p.84.

new rules specific to those programs. EE aside, R.19-01-011 is the appropriate venue to address any and all modifications to the BUILD Program and TECH Initiative. For other incentive programs either pending or still in development, Staff expects those proceedings to reference whatever framework is ultimately adopted in R.19-01-011 and conform those incentive programs accordingly.

3 POST-WILDFIRE RECONSTRUCTION

On May 17, 2019, the CPUC issued a Scoping Memo that divided R.19-01-011 – the building decarbonization proceeding – into four phases and included the following question: “Should the Commission implement any programs dedicated to support the construction of decarbonized buildings in communities affected by wildfires?”

Nine parties submitted comments expressing support for the idea of adopting a statewide program to aide in the reconstruction of decarbonized homes in impacted communities.²⁶ Staff agrees with the parties and believes it is essential to create a dedicated statewide program that is specifically designed to help Californians recover and rebuild post-natural disaster.

3.1 BACKGROUND

With the adoption of California’s Long-Term Energy Efficiency Strategic Plan in 2008,²⁷ the CPUC, in coordination with the CEC, established four “Big Bold Energy Efficiency Strategies” for the state’s building sector. Two of these goals focused

²⁶ Parties that supported wildfire rebuild policy development included: PG&E, SCE, Southern California Gas (SCG), National Resource Defense Council/Sierra Club (NRDC/SC), California Efficiency and Demand Management Council (CEDMC), Environmental Defense Fund (EDF), Grid Alternatives, Joint Community Choice Aggregators, Small Business Utility Alliance, and California Building Industry Association.

²⁷ See: <https://www.cpuc.ca.gov/WorkArea/DownloadAsset.aspx?id=5305>.

exclusively on new residential and commercial construction achieving Zero Net Energy (ZNE) design by 2020 and 2030, respectively. In response to these ambitious new construction goals, the IOUs, through their adopted EE plans, created the residential California Advanced Homes Program (CAHP) and the commercial Savings By Design (SBD) program to incentivize and provide technical support towards achieving the state's adopted ZNE goals. CAHP was approved by the CPUC via D.09-09-047 and provides incentives to residential new construction designs based on the greater than code efficiency achieved, which is measured through the metric known as Energy Design Rating (EDR).²⁸ Residential designs can achieve higher EDR scores through implementation of measures, including advanced building envelope approaches, high efficiency equipment, smart thermostats, and other advanced building techniques. The SBD program provides technical support and financial incentives to non-residential new construction designs based on a project's modeled annual energy and demand savings (kW, kWh, and therms) above Part 6 of Title 24 of the California Code of Regulations (Energy Code). Both programs serve as the foundational base upon which past wildfire rebuild programs were approved.

In July 2014, SDG&E became the first IOU to request CPUC approval for modifications to its CAHP and SBD programs in response to wildfire rebuilds occurring in its service territory. SDG&E's request, via AL 2636-E, was to double the incentive amounts for both CAHP and SBD for residential and commercial building destroyed by the wildfire. The CPUC approved this request, but there were ultimately zero participants in either of the modified programs.²⁹

In January 2018, PG&E, in partnership with SCP and Sonoma County, built upon SDG&E's 2014 wildfire program requests in a collaborative and innovative way. PG&E

²⁸ See: <https://docs.cpuc.ca.gov/PublishedDocs/PUBLISHED/GRAPHICS/107829.PDF> for D.09-09-047.

²⁹ See: <http://regarchive.sdge.com/tm2/pdf/2636-E.pdf> for AL 2636-E.

followed the SDG&E model of requesting increased CAHP and SBD financial incentives while also seeking rule changes to further program success.³⁰ SCP committed additional financial resources to further supplement the proposed doubling of CAHP and SBD program incentives to achieve “carbon free designs” and to provide educational resources in the community to encourage program participation. This program was approved, via AL 3928-G/5219-E, by the CPUC on April 27, 2018 and was named the Advanced Energy Rebuild (AER) program.³¹ In February 2019, in response to the 2018 wildfires in their service territory, PG&E requested, through AL 4068-G/5479-E, that the AER program rules and increased incentive amounts be applied to any residential or non-residential building destroyed by a wildfire with a building permit subject to the 2016 Energy Code.³² This request was supported by two parties, and was approved by the CPUC effective March 23, 2019.³³ With the approval of this AL, the AER program offered a maximum financial incentive of \$17,500 to residential homes being rebuilt all-electric with solar panels and battery installations throughout PG&E’s service territory. In July 2019, PG&E filed AL 4119-G/5588-E requesting that the AER program rules and incentives be extended to residential new construction with a building permit subject to the 2019 Energy Code.³⁴ This AL was protested by the Public Advocates Office (Cal

³⁰ In PG&E’s initial AL-3928-G/5219-E filing the IOU also requested that the CAHP apply to in-law units, a longer timeline be adopted for the program to allow for CAHP participation through 2021 and SBD participation through 2023 under the 2016 Energy Code, expedited custom project design review be completed and the net to gross (NTG) for participating properties be locked at 1.

³¹ See: https://www.pge.com/tariffs/assets/pdf/adviceletter/GAS_3928-G-A.pdf for AL 3928-G/5219-E.

³² See: https://www.pge.com/tariffs/assets/pdf/adviceletter/GAS_4068-G.pdf for Advice Letter 4068-G/5479-E.

³³ Earthjustice, NRDC, EDF, the Sierra Club and Southern California Edison supported PG&E’s AL 4068-G/5479-E request. No protests were filed on this AL.

³⁴ The 2019 Energy Code took effect on January 1, 2020, increasing the energy efficiency requirements of new construction in comparison to the 2016 Energy Code. See: https://www.pge.com/tariffs/assets/pdf/adviceletter/GAS_4119-G-A.pdf for Advice Letter 4119-G/5588-E.

Advocates) claiming that the program did not incentivize new construction above code, and should not be considered energy efficiency. While the revised AER program was only anticipated to achieve a 2-4% energy efficiency savings above the 2019 Energy Code, the CPUC approved the program extension to provide customer clarity and help homeowners rebuild.

SCE built upon the lessons learned from both the SDG&E and PG&E programs and filed AL 3993-E on April 25, 2019, requesting financial incentives and technical support for residential customers impacted by the 2017 and 2018 fires in their service territory.³⁵ Like in the case of SDG&E and PG&E, the SCE program requested approval to increase financial incentives for both the CAHP and SBD program, provide incentives for resilient technologies, such as solar and energy storage, and provide building owners with enhanced technical support. The CPUC approved the program request effective May 25, 2019. SCE's program is called the Clean Energy and Resiliency (CLEAR) rebuild program.

Together PG&E's and SCE's programs have, to date, had the following impacts on California's rebuilding and recovery efforts from wildfire disasters:

- 253 residential buildings have participated in either AER or CLEAR;
- 73 of these residential buildings have been rebuilt all-electric, a key building strategy to achieving the state's decarbonization goals;

In August 2019, Opinion Dynamics completed its first evaluation case study report on the AER program titled *Sonoma Clean Power & PG&E's Advanced Energy*

³⁵ See: https://library.sce.com/content/dam/sce-doelib/public/regulatory/filings/approved/electric/ELECTRIC_3993-E.pdf for Advice Letter 3993-E.

Rebuild Program.³⁶ The case study highlighted nine programmatic best practices and four lessons learned from the program. The nine programmatic best practices included:

- Utilizing existing program infrastructure;
- Layer multiple funding sources;
- Present one forward-facing program to customers;
- Study your customers and design your program accordingly;
- Prewire homes for all electric and solar panel installations
- Establish an induction cooking lending program;
- Educate all stakeholders involved in the construction process;
- Align program strategies and implementation tactics with larger goals; and
- Work with “block captains” in each neighborhood.³⁷

The four lessons learned included:

- The need to connect with customers as early as possible in the building process;
- The need to be prepared to handle waves of program applications;
- The need to allocate sufficient time and funding to recruit, educate, and provide incentives for certified energy analysts (CEAs); and
- The need for additional educational resources and higher incentives to increase the adoption of all-electric homes.

³⁶ See:

https://pda.energydataweb.com/api/view/2415/08.27.2019_Group%20B%20D33.1%20ZNE%20Case%20Study%202%20FINAL%2008-27-2019-1.pdf.

³⁷ Block captains are individuals, or groups of individuals, of an impacted community who understand the program offerings, program requirements, and have community level social network that makes them effective communicators of the program. SCP identified block captains as one of the most cost-effective marketing tools of the AER program.

3.2 CHALLENGES

Staff believes it is necessary to adopt rules and create a freestanding post-natural disaster rebuild program separate from new construction programs (CAHP and SBD) and the existing wildfire rebuild programs (AER and CLEAR) for the following reasons:

- CAHP is first and foremost a program focused on influencing the design and construction of new residential homes built by production builders. Production builders' decision-making requires different techniques and less technical assistance than homeowners rebuilding custom designed homes. WNDRR is focused not on production builders, but rather homeowners.
- Given the minimal non-residential market interest displayed in both AER and CLEAR for increased incentives and technical support through SBD, Staff finds it appropriate to narrowly focus on single- and multi-family residential rebuild efforts.³⁸
- There is a clear need for speed in program mobilization. As identified in the Opinion Dynamics 2019 case study report, the need to connect as early as possible with potential participants is essential to programmatic success. As such, Staff intends to adopt clear program rules and requirements through a CPUC decision to enable swift responses to future impacted communities.
- The AER and CLEAR programs as approved are only applicable to targeted parts of the state and require CPUC approval to expand to each new impacted area. Statewide program uniformity will further the ability of the program to mobilize quickly and to a broader range of natural disaster events.

³⁸ Staff will continue to coordinate across commercial building incentive programs to support both small and large commercial sectors recover from natural disaster events in alignment with state goals.

- Community coordination proved essential to the success of the AER and CLEAR programs. In locations where AER and CLEAR are being implemented, it is the combination of IOUs, CCAs, third party implementers, local AQMDs, and community-based organizations (CBOs) that have achieved program success.³⁹ The statewide implementation of CAHP and program design focus on production builders make community coordination and program implementation difficult to accomplish.
- A need to have a program focused on increasing adoption of all-electric new construction through homeowner education. As noted in the Opinion Dynamics 2019 report, additional educational efforts and increased financial incentives are necessary to entice greater number of program participants to rebuild all-electric. A statewide program implemented at the local level in coordination with the community's recovery efforts provides a unique opportunity to educate homeowners about the financial, health and climate benefits of all-electric construction.
- The use of federal and state low-income housing tax credits⁴⁰ to rebuild affordable low-income housing in communities impacted by wildfires and natural disasters requires additional technical support, programmatic resources, and longer program timeline to enable recovery. A program with simple

³⁹ Established under the 1947 Air Pollution Control Act, Air Pollution Control Districts (ACPDs) and AQMDs are county or regional governing authorities that have the primary responsibility for controlling air pollution from stationary sources. California has 35 ACPDs and AQMDs. For a full list see: <https://ww2.arb.ca.gov/california-air-districts>.

⁴⁰ The federal Low-Income Housing Tax Credit (LIHTC) provides a subsidy for the acquisition, construction, and rehabilitation of affordable rental housing for low- and moderate-income tenants. In California the tax credit is administered via the California Treasurer's Office and the California Tax Credit Allocation Committee. For more details see: <https://www.taxpolicycenter.org/briefing-book/what-low-income-housing-tax-credit-and-how-does-it-work>.

statewide rules and a community-based implementation approach will be better positioned to identify and support these projects as they are developed.

As further program implementation design and details become available for the both the new statewide CAHP and SBD programs, as well as the forthcoming BUILD Program, Staff will seek to streamline and coordinate program rules to achieve administrative efficiencies wherever possible.

3.3 PROPOSAL

The WNDRR⁴¹ program proposed here is an acknowledgement and response by the CPUC that, as California deals with the impacts of climate-driven and naturally occurring natural disasters, additional programmatic support is necessary to assist impacted residential homeowners and multi-family properties. The WNDRR program is designed to be distinct and separate from the existing AER and CLEAR programs, as well as the new statewide iterations of CAHP and SBD currently being reviewed through the EE third party solicitation process and anticipated to come into effect starting 2021.

WNDRR Program Principles

Like the design of the AER and CLEAR programs, the WNDRR program is designed to enable effective utility and community response to natural disaster events. As such, WNDRR is designed around the following three core principles:

- **Customer First** – Program delivery to the recipient is simple, seamless, and clear. The WNDRR program rules, as proposed, are designed to acknowledge that homeowners and multi-family tenants have gone through a traumatic experience

⁴¹ Pronounced “Wonder” (i.e., “to be filled with admiration, amazement, or awe”).

and first and foremost want to return to their “normal lives” as quickly as possible.

- **Regulatory Simplicity** – To ensure the customer experience is simple, seamless, and clear, the regulatory rules proposed for WNDRR are intended to ease the post natural disaster reconstruction process. This approach will help ensure implementation teams can swiftly respond to impacted communities and customers after a natural disaster event.
- **Dedicated Funding** – Program funding for WNDRR is designed to be proactively available and ready to be deployed in response to natural disasters. Rather than deplete CAHP funds, WNDRR will function as its own program with its own dedicated funding.

WNDRR Program Eligibility

Staff proposes all red-tagged⁴² single-family and multi-family residential buildings in a city, county, or combined jurisdiction that declares a Local Emergency Proclamation as eligible for the WNDRR program.⁴³ In doing so, the program expands its impact and reach beyond just the communities impacted by wildfires and situates the program as a recovery vehicle in the event of large earthquake in the state.⁴⁴ Red-tagged homes rebuilt through the WNDRR program qualify for the incentive levels

⁴² “Red-tagging” means a building has been determined to be unsafe for occupancy by the local building authority.

⁴³ Pursuant to California Government Code Section 8680.9, a local emergency is a condition of extreme peril to persons or property proclaimed as such by governing body of the local agency affected by a natural or manmade disaster. See: [https://www.caloes.ca.gov/RecoverySite/Documents/Proclamation%20and%20CDAA%20Process%20Fact%20Sheet%20Final%20Feb%202019%20\(003\).pdf](https://www.caloes.ca.gov/RecoverySite/Documents/Proclamation%20and%20CDAA%20Process%20Fact%20Sheet%20Final%20Feb%202019%20(003).pdf).

⁴⁴ From 1950 to 2017 California Governors have made 309 State of Emergency declarations in response to natural disasters. A 127 of these were classified as a flood or storm. <https://lao.ca.gov/Publications/Report/3918>.

associated with the Energy Code requirements in effect at the date of building permit approval, not the date the home commences construction. This approach for providing incentives based on building permit date is standard practice in new construction incentive programs and does not unfairly punish the longer rebuild time periods for communities impacted by natural disasters.

Staff also proposes that only properties being rebuilt all-electric, with no supplemental fuel from propane, be eligible for the WNDRR program for three reasons. First, rebuilding all-electric not only reduces the upfront capital costs for the property owner, but it also lowers long term natural gas infrastructure costs for all-natural gas ratepayers. E3, in their April 2019 report entitled *Residential Building Electrification in California*, estimates the capital costs savings of building all-electric range, for the property owner, “from \$3,000 to more than \$10,000 over a mixed fuel home.”⁴⁵ This savings figure is inclusive of both in front of the meter costs – including gas connection costs – and behind the meter costs of providing natural gas to appliances. For the California natural gas ratepayer, the savings are a combination of the avoided natural gas line extension allowance approved under Rules 15 and 16, as well as the potential stranded asset costs long-term.

Second, Staff believes providing rule continuity across building decarbonization programs is essential. As adopted in D.20-03-027, the BUILD Program can only provide “incentives to new residential housing that is at a minimum, all electric, given the state’s policy commitment to a zero-GHG electricity supply by 2045 and the risk of

⁴⁵ E3’s Residential Building Electrification in California, P. 55-56, accessible at https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.

locking in new natural gas assets that could be unused or underutilized before the end of their life.”⁴⁶

Third, as identified in E3’s *Deep Decarbonization in a High Renewables Future* report, “building electrification is likely to be a lower-cost, lower-risk, long-term strategy compared to renewable natural gas” for achieving California’s building emission reduction goals.⁴⁷ Given the economic benefits, regulatory simplicity, and long-term strategic policy value of all-electric buildings to achieving California’s climate goals, Staff finds it appropriate to only provide WNDRR incentives to all-electric rebuilds.

WNDRR Program Incentives

The WNDRR program is intended to help Californians impacted by wildfires and other natural disasters rebuild their residential homes and multi-family buildings in alignment with state GHG goals. As such, Staff proposes that the program focus on providing incentives for modeled whole building GHG emission reductions above prescriptive Energy Code requirements. GHG emission reductions will be calculated utilizing the reporting outputs from the CEC’s California Energy Code Compliance Residential modeling software (CBECC-Res) for single-family and low-rise residential buildings and the commercial version (CBECC-Com) for high-rise residential buildings.⁴⁸ Incentive values will be based on the GHG emission values adopted in the CPUC’s ACC, and be administered in a tiered structure to simplify program

⁴⁶ D.20-03-027, p.65.

⁴⁷ E3’s *The Challenge of Retail Gas in California’s Low Carbon Future: Technology Options, Customer Costs, and Public Health Benefits of Reducing Natural Gas Use*, P. 19. See: https://www.ethree.com/wp-content/uploads/2018/06/Deep_Decarbonization_in_a_High_Renewables_Future_CEC-500-2018-012-1.pdf.

⁴⁸ The CEC is currently developing a specific multi-family energy code for inclusion in the 2020 Energy Code updates. Upon the 2022 code going into effect in 2023 the WNDRR program shall use the adopted modeling software to calculate GHG emissions.

administration. Details of the incentive calculation, incentive values, and incentive tiers are explained below.

WNDRR Incentive Layering

To ensure clear new construction boundaries, Staff recommends WNDRR program participants not be eligible for CAHP and BUILD Program Incentives. Staff encourages the WNDRR program implementation teams to maximize all other incentives available to eligible participants. Other incentives may include, but are not limited to, those from SGIP, the TECH Initiative, local CCA programs, and any available incentives from the IOUs for electrification as a means of avoiding the replacement of natural gas distribution pipe.

Energy Code Compliance Pathways

To understand the proposed program incentive structure, it is important to understand how buildings comply with the Energy Code in California. Every building project in California requires energy analysis documentation showing Energy Code compliance, along with all other construction compliance documents, to receive a building permit from a city or county building department. The energy analysis documentation ensures that all new buildings – or existing buildings with major modifications – comply with Energy Code rules. To create the necessary energy analysis documentation, the CEC provides two compliance pathways: a prescriptive pathway and a performance pathway. The prescriptive pathway is the simplest, but least flexible approach. Buildings comply with prescriptive pathway by meeting the minimum energy requirements identified in the Residential Compliance Manual⁴⁹, for single-family homes and low-rise multi-family buildings, or the Nonresidential Compliance

⁴⁹ See: https://www.energy.ca.gov/sites/default/files/2020-06/Compliance_Manual-Complete_without_forms_ada.pdf for the 2019 Residential Compliance Manual.

Manual⁵⁰, for high-rise multi-family buildings. A few examples of prescriptive requirements include levels of attic insulation, appliance efficiency, and building air tightness. In contrast, the performance pathway is a more complicated option that enables the builder to model trade-offs of different design elements, including building orientation, building materials, number of fenestrations (i.e., windows), as well as the efficiency of the various materials and appliances used, while still achieving Energy Code requirements. Buildings using the performance pathway must show Energy Code compliance through either the CBECC-Res or CBECC-Com software, or another CEC-approved modeling software.

An example of a CBECC-Res Compliance Summary Report, which provides a range of output metrics for the user, is seen in the figure below. For the WNDRR program, the key output metric is the “CO2 Generated: Total (metric tons/yr).” This metric is the difference between the “Total CO2 Potential: excl Solar & Flexibility” and the “CO2 Saved by Solar Electricity.”

	Total CO2 Potential: (excl. Solar & Flexibility) (metric tons/yr)	CO2 Saved by Solar Electricity:		CO2 Generated:	
		Self Consumed (metric tons/yr)	Exported to Grid (metric tons/yr)	Total (metric tons/yr)	Excluding Exports (metric tons/yr)
Standard Design	4.03	0.28	0.45	3.31	3.75
Proposed Design	4.03	0.28	0.45	3.31	3.75

Table 5: Sample CBECC Res Compliance Summary Report including CO2 Generated: Total (metric tons/yr) metric, which is used to calculate the incentive tier for the project.

⁵⁰ See: https://ww2.energy.ca.gov/publications/displayOneReport_cms.php?pubNum=CEC-400-2018-018-CMF for the 2019 Nonresidential Compliance Manual.

GHG Emission Reduction Calculation

To calculate the GHG emission reduction benefits of single-family homes and multi-family properties being rebuilt through the WNDRR program, Staff proposes to calculate an “annual avoided GHG metric” for the final building design using the following three-step process:

- Step 1: Calculate a “standard GHG emission baseline” metric using the building appropriate CBECC software utilizing the building’s design dimensions (orientation, height, number of fenestrations) and prescriptive levels of insulation, air sealing, appliance efficiency, etc. applicable to dual fuel building in that climate zone. The “standard GHG emission baseline” metric will be the “CO2 Generated: Total (metric tons/yr)” under these dual fuel design assumptions.
- Step 2: Calculate a “proposed GHG emission design” metric using the building appropriate CBECC software utilizing the building design dimensions (orientation, height, number of fenestrations) with improved levels of insulation, air sealing, appliance efficiency, etc. as determined by the design team for that climate zone. The “proposed GHG emission design” metric will be the “CO2 Generated: Total (metric tons/yr)” under these design assumptions. The building must be an all-electric design to qualify for the WNDRR program.
- Step 3: Calculate the difference between the “standard GHG emission baseline” and the “proposed GHG emission design” to calculate the “annual avoided GHG metric.” This metric will be used to determine the incentive tier the building design qualifies for.

GHG Emission Values

To establish the value of the incentive tiers for the WNDRR program, Staff proposes to use the GHG values recently adopted by the CPUC in the 2020 ACC updates via Resolution E-5077.⁵¹ The GHG values adopted in the 2020 ACC updates are the sum of the “monetized carbon cap and trade allowance cost embedded in energy prices, and the non-monetized carbon price beyond the cost of cap and trade allowance” and are projected out through 2050.⁵² This multi-decade time horizon makes these values ideal to base an incentive on due to the CBECC model Time Dependent Valuation (TDV) cost-effectiveness⁵³ being based on a 30-year time period and the 61-year average lifespan of any residential new construction project that would receive incentives through the WNDRR program.⁵⁴ Staff proposes updating the ACC GHG values as they are adopted by the CPUC and using the 2050 year GHG value for incentive calculations beyond year 2050 until the CPUC adopts values for additional years.

Incentive Tiers

To ensure a simple, seamless, and clear incentive amount for homeowners, Staff proposes creating incentive tiers that value a range of annual GHG emissions avoided. This tiered approach will enable more straightforward incentive calculations and program administration than attempting to calculate and value an average, or precise, amount of GHG emissions avoided on a building-by-building basis. In addition, the

⁵¹ Resolution E-5077 is available:

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M340/K054/340054558.PDF>.

⁵² CPUC 2020 ACC Documentation, p.20. Available for download at the following link:

<https://www.cpuc.ca.gov/General.aspx?id=5267>.

⁵³ See E3’s Dependent Valuation of Energy for Developing Building Efficiency Standards: 2022 Time Dependent Valuation and Source Energy Metric Data Sources and Inputs for an explanation:

https://drive.google.com/file/d/1xOg-BF8OAmBCypLncB-m_DuRchNcs25p/view.

⁵⁴ *Impact of Lifetime on U.S. Residential Building LCA Results*, Aktas, Bilec. (2012), p.8.

tiered structure organically accounts for modifications to the Energy Code, updates to the CBECC software, and modifications to the ACC GHG values.

Staff proposes the following incentive tiers based on the 30-year value of annual avoided GHG emissions using the GHG emission values discussed earlier starting in 2021.

Annual GHG Avoided Tier (metric tons/year)	WNDRR Incentive Value (\$)
1.00 – 1.99	\$11,000
2.00 – 2.99	\$22,000
3.00 – 3.99	\$33,000
4.00 – 4.99	\$44,000
5.00 – 5.99	\$55,000

Staff calculated the proposed incentive tiers by multiplying the annual calendar year GHG value and summing the total for each annual GHG avoided tier.⁵⁵ As can be seen in the table below, the incentive levels based on this calculation scale by approximately \$11,000 with each incremental annual avoided ton of GHG. To simplify program administration, the proposed incentive tiers are the rounded down values of the calculated values in the table below.

Annual GHG	30 Year Avoided GHG
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⁵⁵ For example, Tier 1 is calculated by taking the summation of 1 metric ton/year of annual GHG saved and multiplied by the annual GHG value adopted in the Avoided Cost Calculator on annual basis from 2021 through 2050, $\sum (1 \times 103.82 + 1 \times 111.79 + 1 \times 120.38 \dots 1 \times 887.56)$.

Avoided Tier (metric tons/year)	Value (\$)
1.00 – 1.99	\$11,0952.56
2.00 – 2.99	\$22,185.12
3.00 – 3.99	\$33,277.68
4.00 – 4.99	\$44,370.23
5.00 – 5.99	\$55,462.79

WNDRR Program Kicker Incentives

As noted earlier, the average residential new construction project in the United States has a 61-year lifespan, making all-electric new construction a unique opportunity to think long-term about future energy and grid challenges facing California’s single-family and multi-family residential building stock. One challenge that is highlighted in E3’s *Residential Building Electrification in California: Consumer economics, greenhouse gases and grid impacts* report is the long-term increase in winter electrical load. The report states that building electrification, at scale, “will lead to an increase in winter electricity demand across all climate zones,” and increased electrified heating load will create a “morning peak and a second peak in the afternoon.”⁵⁶ The study also goes on to state that California’s “winter electricity demand is likely to remain lower than the residential summer peak demand levels” under typical weather years. While E3 does not project the increased winter load to exceed the system summer “Cooling Peak,” it does project increases electrical load in winter, creating a “Peak Heat” demand on the

⁵⁶ E3’s *Residential Building Electrification in California: Consumer economics, greenhouse gases and grid impacts*, p.VII. See: https://www.ethree.com/wp-content/uploads/2019/04/E3_Residential_Building_Electrification_in_California_April_2019.pdf.

grid at one of the most challenging times to decarbonize electricity grid.⁵⁷ This “Peak Heat” challenge is visualized in the heatmap below from a 2018 CEC presentation.⁵⁸

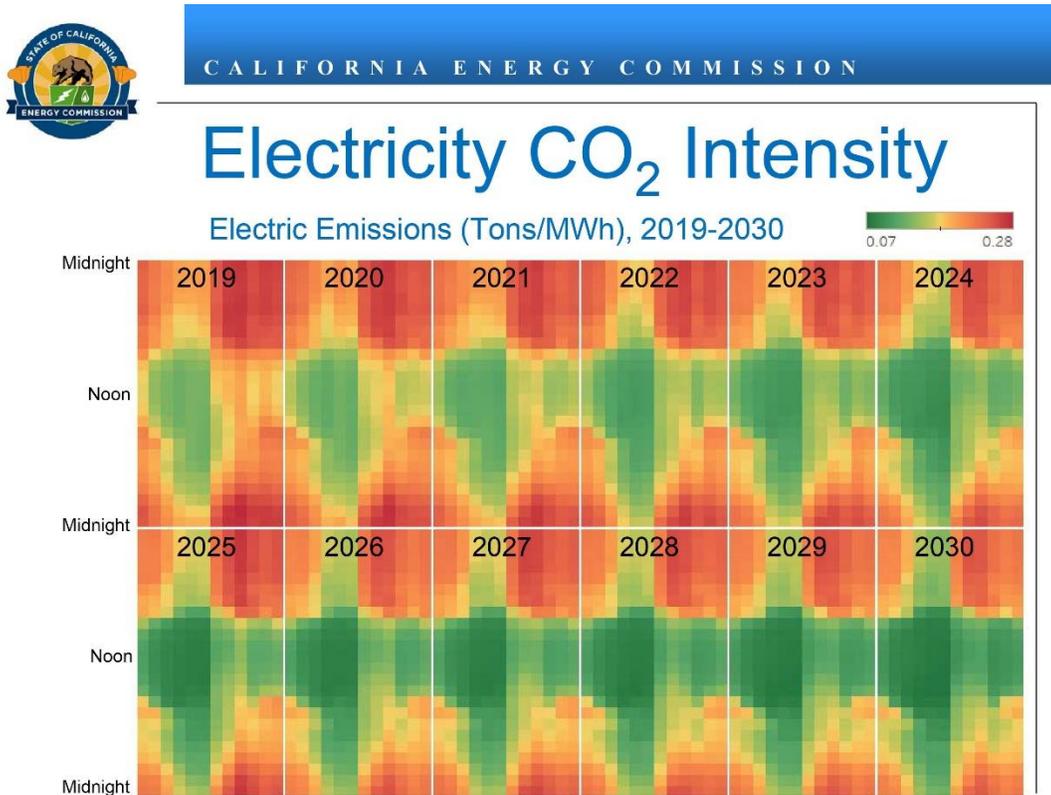


Figure 1: This heatmap visualizes the change in Electricity CO₂ intensity from 2019 to 2030. Green represents lower CO₂ emissions while red represented higher CO₂ emission levels. Electricity CO₂ intensity is anticipated to the greatest during the morning and evening hours in winter.

Over time, as the state achieves the goals set by SB 100 for a 100% clean energy grid, the electric sector GHG emissions challenge will decrease, but the cost of providing that resource could increase. Given this multi-decade challenge, Staff believes it is vital to seek out solutions today that minimize emissions in the near-term and

⁵⁷ E3’s Peak Heat and Capacity Benefits of Energy Efficiency ACEEE Energy Efficiency as a Resource Conference, October 17, 2019, Slide 5. See:

https://drive.google.com/file/d/12N6XonG8mb_mr2fauDOFemEgMahGqVFB/view.

⁵⁸ Building Decarbonization Presentation by CEC Staff Martha Brook, June 14, 2018, Slide 12. See:

<https://efiling.energy.ca.gov/GetDocument.aspx?tn=223817&DocumentContentId=54026>.

potential costs in the long-term. One possible solution to this challenge is to encourage Passive House design principles.

Passive House design principles are based on a holistic building design that focuses on building envelope and building airtightness to minimize heating and cooling demand. Passive House designs have been implemented in both North America and Europe since the 1980s and have proven to be effective at lowering heating demand and heating peak loads. In 2015, the US Department of Energy (DOE) issued the *Climate-Specific Passive Building Standards*, which estimated reduction in heating loads by 86% and a peak heating load reduction by 77%⁵⁹ in comparison to the Building America 2009 benchmark developed by DOE's Residential Buildings Program and the National Renewable Energy Laboratory (NREL).⁶⁰ In addition to the benefits that Passive House designs could provide to the grid, the lessons learned and findings from any WNDRR project that completes the Passive House certification could inform other new construction programs. Staff, through the Energy Efficiency Group B Evaluation Measurement and Verification group,⁶¹ started exploring opportunities to incorporate Passive House design strategies into CAHP. In December 2019, Opinion Dynamics issued the *Barriers to Incorporating Passive House Concepts in Residential New Construction*

⁵⁹ Department of Energy *Climate-Specific Passive Building Standards Executive Summary p.xii* accessible at the following link: https://www1.eere.energy.gov/buildings/publications/pdfs/building_america/climate-specific-passive-building.pdf.

⁶⁰ The Building America Benchmark tool was developed by DOE and NREL to track progress towards a whole-house energy savings goal of 40%-70% and on-site power production of up to 30%. The benchmark represents typical residential construction at fixed point in time. See: <https://www.nrel.gov/docs/fy10osti/47246.pdf>.

⁶¹In D.05-11-011 the Commission authorized Energy Division to assume management and contracting for all Evaluation Measurement & Verification (EM&V) studies being completed under the Energy Efficiency portfolio. Group B's focus is on Code & Standards Development and Adoption; Emerging Technologies Programs; Marketing, Education and Outreach; Workforce, Education, and Training, and Zero Net Energy. See: <https://www.cpuc.ca.gov/General.aspx?id=4373>.

report⁶² and on June 24, 2020, Staff kicked off a Low Carbon Homes Working group to explore overcoming barriers to Passive House construction. Given the potential for Passive House designs to lower emissions in the near-term and provide long-term value to the grid, the desire of Staff to explore the inclusion of Passive House incentives in the CAHP, and the WNDRR program’s focus on custom-built homes, Staff believes that the WNDRR program is an ideal venue to provide incentives for Passive House projects. However, due to the lack of project cost data on the incremental cost of building to Passive House standards, Staff proposes only providing incentives for 75% of the certification costs for single-family and multi-family buildings that achieve and complete the certification process for either the Passive House International⁶³ or Passive House US standards⁶⁴. This approach accomplishes the following:

- Provides a small but meaningful signal to the new construction marketplace about the electricity grid, GHG benefits, and climate resiliency benefits of exploring Passive House design principles;
- Provides the WNDRR program evaluator with energy use details to compare Passive House homes against their peers; and
- Provides incentives to further the number of Passive House buildings in California.

WNDRR Equity Incentives

⁶² Opinion Dynamics *Barriers to Incorporating Passive House Concepts in Residential New Construction* accessible at the following link:

http://www.calmac.org/publications/Passive_Home_Whitepaper_1_22_2020_FinalES.pdf.

⁶³ Passive House International is a global standard for passive house design that is not climate zone specific. For more details see: https://passivehouse-international.org/index.php?page_id=150.

⁶⁴ Passive House US was developed by DOE and takes into consideration a range of climate conditions, market conditions, and other variables in North America climate zones. For more details see: <https://www.phius.org/what-is-passive-building/passive-house-principles>.

To assist in the recovery and redevelopment of low-income housing impacted by a wildfire or natural disaster, Staff proposes establishing equity customer incentive levels for the WNDRR program. These incentives would be available to any low-income single-family homeowner who was previously enrolled in, or is eligible for, the California Alternate Rates for Energy (CARE) program, and any multi-family property utilizing federal or state low-income housing tax credits to rebuild. For eligible equity customers, Staff proposes increasing the regular WNDRR incentives by 50%, as shown below.

Annual GHG Avoided Tier (metric tons/year)	WNDRR Equity Incentive Value (\$)
1.00 – 1.99	\$16,500
2.00 – 2.99	\$33,000
3.00 – 3.99	\$49,500
4.00 – 4.99	\$66,000
5.00 – 5.99	\$82,500

Program Administration and Implementation Team

The administration of the WNDRR program is unique to the circumstances and the rebuilding conditions that the program will be implemented in. Any major natural disaster event impacts community stakeholders in a variety of ways that must be efficiently navigated in order to enable recovery. To enable this navigation, Staff proposes a WNDRR program implementation team that includes the following stakeholders from each of the three large electric IOUs’ service territories:

- The IOU serving the impacted community;

- A third-party program implementer;
- A local jurisdiction member such as a city department, county department, or a CCA; and
- A CBO.

Each member's role in the implementation of the program is explained in detail below.

Electric IOU

The three large electric IOUs will serve as the overarching program administrators in any impacted communities. The IOUs will be responsible for gathering information in partnership with the impacted cities and/or counties on the number of red-tagged buildings eligible for the program, the disbursal and accounting of program funds, filing annual program ALs with the CPUC, and helping coordinate other administrative tasks.

Third-Party Program Implementer

The third-party program implementer will be responsible for assisting the electric IOU and local jurisdiction member with the technical implementation details of the program and reviewing program applications. The third-party program implementer will also be responsible for identifying, hiring, and retaining an adequate number of CEAs to provide technical assistance and modeling expertise to homeowners participating in the WNDRR program. Each of the three large electric IOU shall issue an RFP for this role in their service territory.

Local Jurisdiction

The local jurisdiction member will serve as a critical coordinator of the program at the community level. Examples of a local jurisdiction member include, but are not necessarily limited to, a CCA staff member, a municipal agency staff member, a member of a city council, or a member of the county board of supervisors. This team

member will be responsible for coordinating with the local permitting office, organizing community events with the CBO team member, and recruiting program participants. It is fundamental to the success of the program that the local jurisdictions be bought into the WNDRR program and be proactively promoting the program to eligible homeowners. A new local jurisdictional member will need to be identified for each natural disaster event.

Community-based Organization

The CBO is responsible for assisting all members of the team with hosting community events and recruiting program participants to the WNDRR program. This organization should be a local non-profit entity with experience in community development and organization. A new CBO member will need to be identified for each natural disaster event.

Program Funding

Funding for the WNDRR program faces two unique challenges. The first challenge is that funding must be readily available to respond to a natural disaster with an unknown scale. The second challenge is that, unlike Public Purpose Program charges, which are continually collected and invested, WNDRR program funds could be collected for multiple years, but never utilized due to a lack of need for the program. Given these unique circumstances, Staff proposes the following funding structure for the program.

Funding Amount and Source

Staff proposes \$5 million in annual funding be collected for a period of 10 years, for total program funding of \$50 million. The funding of the WNDRR program will follow the structure established under D.20-03-027 for the BUILD Program and TECH Initiative. Funds will be collected through proceeds obtained by gas corporations from the auction of GHG emission allowances allocated as part of the state's Cap-and Trade program. All gas corporations who receive allowances for the Cap-and-Trade program

will be required to contribute their share of the annual \$5 million “WNDRR Program Compliance Costs” as apportioned below:

- SoCalGas: \$2,463,000 (49.26% of \$5 million)
- PG&E: \$2,117,000 (42.34% of \$5 million)
- SDG&E: \$338,500 (6.77% of \$5 million)
- Southwest Gas Corporation (SWG): \$81,500 (1.63% of \$5 million)

Staff proposes that WNDRR program compliance costs be remitted by the gas corporations as soon as possible. First year funds should be deducted from the California Climate Credit that will be provided to customers in April of 2021 and remitted in their entirety to the contracting agent no later than June 1, 2021. Moving forward, funds should be remitted on a quarterly basis starting in Q1 2022 (i.e., no later than March 1, 2022) and ending in Q4 2031 (i.e., no later than December 1, 2031). Funds shall be available for administration until the end of calendar year 2032, at which point any unspent funds remaining on July 1, 2033 shall be returned to the ratepayers of the respective gas corporations as part of the California Climate Credit.⁶⁵

Contracting Agent and WNDRR Balancing Account

Funds remitted by the gas corporations on a quarterly basis shall be directly issued to the designated WNDRR program “contracting” agent. This contracting agent will be responsible for establishing a WNDRR Balancing Account to collect the remittances, track the issuances of program funds, and any interest accrued over this time. Staff proposes that SCE serve as the contracting agent for the WNDRR program. SCE currently serves as the contracting agent for the TECH Initiative and will have the experience processing and administering building decarbonization program funds.

⁶⁵ This return of unspent funds aligns with the timeline adopted in D.20-03-027 to return any unspent funds for the BUILD Program and TECH Initiative.

Claiming Funds and Annual Reporting

To further streamline the ability of program administration teams to swiftly respond to natural disasters, Staff proposes that the processing of WNDRR program funds and WNDRR program reporting be completed on an annual basis. Starting on July 1, 2022, Staff proposes each of the three large electric IOUs be required to file a WNDRR Annual Report via Tier II AL to Energy Division summarizing any WNDRR program activities in their service territory, categorized by individual qualifying natural disaster and the amount of funding requested to administer the program. This Annual Report must meet all the requirements laid out in this document, including, but not limited to, the following:

- Explanation of the Local Emergency Proclamation(s) made that makes the natural disaster eligible for the WNDRR program;
- Explanation of the WNDRR program team members;
- Explanation of community engagement strategies implemented in the last years;
- Program uptake figures based on the number of eligible properties to date, including properties seeking Passive House Certification;
- Projected GHG program savings;
- Justification of funding amount being requested including a program budget;
- Inclusion of Bi-Annual Program evaluation as appropriate; and
- All data required for gas corporations to comply with their reporting obligations pursuant to the Cap-and-Trade program.⁶⁶

⁶⁶ Cap-and-Trade program data requirements include: (1) total avoided GHG emissions expected from that year's expenditures (estimated); (2) total expenditures; (3) itemization of administration and outreach expenditures; and (4) description of the nature and purpose of the program, including aspects such as eligibility requirements. See: 17 CCR Section 95893 (e).

Upon approval of the WNDRR Annual Report, the contracting agent shall issue the approved funding amount to each participating IOU.

Program Evaluation and Cost-Effectiveness

Given the uniqueness of the WNDRR program as primarily a natural disaster recovery mechanism, Staff proposes that program evaluation and cost-effectiveness be completed on an ex-post⁶⁷ basis every five years. By July 30, 2024, the statewide contracting agent shall issue an RFP for a program evaluator who shall produce a mid-program evaluation report by December 31, 2025. This evaluation report shall include each WNDRR program participant's annual GHG emissions based on a minimum of 12 months of normalized meter electricity data, an average cost per metric ton of avoided GHG emissions based on normalized metered electricity data, and recommendations for program improvements. In 2026, Staff, in coordination with the IOUs, shall use the 2025 WNDRR evaluation report to evaluate impact of the program to date and potential program modifications to improve efficacy. Staff shall use the Resolution process to obtain CPUC approval for any proposed program modifications. By July 30, 2031, the statewide contracting agent shall issue a second RFP for a program evaluator who shall produce a final program evaluation report by December 31, 2032. In 2033, Staff, in coordination with the IOUs, shall use the 2032 WNDRR evaluation report to recommend to the CPUC if the program shall continue or not.

⁶⁷ Ex-post evaluation is a comparison of actual results to modeled results. In the case of WNDRR, this will be a comparison of CBECC software CO2 Generated: Total (metric tons/yr) to the calculated annual GHG emissions of a participating residential single-family or multifamily building based on normalized metered data.

4 BASELINE ALLOWANCE MODIFICATIONS

In addition to addressing SB 1477 implementation considerations and reconstruction in areas damaged by wildfires, the preliminary scoping memo for R.19-01-011 also discusses establishing a building decarbonization policy framework.⁶⁸ One of the technical issues identified for potential consideration when developing a policy framework is “Incentive types and levels,” including “alternative rates or rate structures.”⁶⁹ Another technical issue identified is “Rates” in a broader context.⁷⁰ More specifically, the preliminary scoping memo highlights the following rate-related considerations:

Rates: Whether electric utilities should develop alternative rate designs to help incent customers and vendors to select and use equipment in ways that reduce GHG emissions, while also managing the impacts on customer bills. Examples of rate design changes that could help align GHG emissions reductions with individual customer economic interests include: an electric rate that includes baseline adjustments for fuel substitution; removal of non-coincident demand charges and high user charges; and reduction of full retail-rate netting for rooftop solar.⁷¹

Of the rate-related considerations listed in the preliminary scoping memo, the matter of baseline adjustments for fuel substitution is especially important. As mentioned previously in Section 2, there are currently more than a dozen different building decarbonization programs in various stages of development or implementation, most of which focus on replacing natural gas space and water heating

⁶⁸ See: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M264/K629/264629773.PDF>, p.10.

⁶⁹ *ibid*, p.17.

⁷⁰ *ibid*.

⁷¹ *ibid*.

equipment with highly efficient electric alternatives utilizing heat pump technology. While customers who install electric space heating equipment are currently entitled to an all-electric baseline allowance, that allowance is not available to customers who install electric water heating equipment if they still rely on natural gas for space heating.⁷² Without action taken to provide some form of baseline adjustment for customers that install electric water heating equipment, those customers risk seeing higher electric bills that effectively punish them for the very fuel substitution that the CPUC is encouraging through the various incentive programs it has approved.

The broader framework of what policies, rules, and procedures the CPUC should adopt to facilitate the decarbonization of buildings – inclusive of any action relating to rates – is currently scoped as a Phase IV consideration in R.19-01-011.⁷³ However, Phase IV does not yet have a proposed timeline for regulatory action. Meanwhile, many of the incentive programs for building decarbonization are set to begin roll-out in early 2021 while others have already begun. If the CPUC seeks to encourage maximal fuel substitution, it must act expeditiously to provide the IOUs with the direction necessary to implement new baseline allowances for customers who install electric water heating equipment. As such, it behooves the CPUC to move up its originally envisioned timeline for consideration of baseline adjustments and include those considerations as part of Phase II.

⁷² See Public Utilities (PU) Code Section 739(b):

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=739.&lawCode=PUC.

⁷³ See: <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M290/K324/290324466.PDF>, p.5.

4.1 BACKGROUND

The vast majority of residential IOU customers in California are currently billed for electricity on a tiered usage basis.⁷⁴ PU Code Section 739(a)(1)⁷⁵ directs the CPUC to establish a “baseline quantity” for residential electricity usage based on 50 to 60 percent of average residential consumption.⁷⁶ This baseline quantity is, in turn, used to determine pricing tiers, with all electricity consumed up to the baseline quantity considered “Tier 1” usage and electricity consumed above the baseline quantity considered higher tier usage with a higher price per kWh so as to encourage conservation by discouraging excessive electricity consumption.⁷⁷ California’s three large electric IOUs’ service areas are currently divided into 23 distinct baseline territories⁷⁸ that are assigned different baseline quantities to account for differences in electricity consumption across climate zones.

⁷⁴ Approximately 89% of SCE customers and 86.5% of PG&E customers are on a tiered rate plan. In contrast, however, only 26% of SDG&E customers are on a tiered rate plan.

⁷⁵ See:

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=739.&lawCode=PUC.

⁷⁶ For PG&E basic customers, 53.8% of average usage based on 2017 GRC Phase II decision (D.18-08-013); for SCE basic customers, 60% of average usage based on 2018 GRC Phase II decision (D.18-11-027); for SDG&E basic customers, 50% of average usage based on Residential Rate Reform proceeding decision (D.15-07-001).

⁷⁷ Electricity consumption that falls between 100% and 400% of the baseline quantity is considered “Tier 2” usage. Any consumption above 400% of the baseline quantity is subject to a high usage surcharge.

⁷⁸ PG&E has 10, SCE has nine, and SDG&E has four.



ENERGY STATEMENT

www.pge.com/MyEnergy

Account No: 1023456789-0
Statement Date: mm/dd/yyyy
Due Date: mm/dd/yyyy

Details of Electric Charges

mm/dd/yyyy - mm/dd/yyyy (30 billing days)

Service For: 1234 Main Street
Service Agreement ID: 9087654321
Rate Schedule: E1 TH Residential Service

mm/dd/yyyy - mm/dd/yyyy	Your Tier Usage	1	2	
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Tier 1 Allowance	303.00	kWh	(30 days x 10.1 kWh/day)	
Tier 1 Usage	303.000000	kWh	@ \$0.xxxxx	\$xx.xx
Tier 2 Usage	700.000000	kWh	@ \$0.xxxxx	xx.xx
Energy Commission Tax				xx.xx

Total Electric Charges \$430.16

Service Information

Meter #	1098765432
Total Usage	1,003.000000 kWh
Baseline Territory	T
Heat Source	Electric
Serial	D
Rotating Outage Block	50

Additional Messages

You are enrolled in a Tiered rate plan where the price of energy increases based on the amount of energy used. Effective March 1, your rate plan will be simplified and the number of tiers will be reduced from 3 to 2. For more information please visit: pge.com/tierchange.

Figure 2: Sample PG&E Bill Showing Tiered Pricing and Baseline Territory Information⁷⁹

In addition to each customer’s standard “geographic baseline,” statute also provides special baseline allowances for qualifying customers. Special baseline allowances include a “medical baseline” for customers who use greater amounts of electricity due to their dependence on life-support equipment⁸⁰ and an “all-electric baseline” for customers who use greater amounts of electricity either due to their reliance solely on electricity as a fuel source or because they installed electric space heating equipment.⁸¹ The medical baseline allowance is provided as a fixed kWh allotment for electric customers⁸² irrespective of what baseline territory the customer is located in. In contract, the all-electric baseline allowance is calculated in a similar manner as the standard geographic baseline, a key exception being that the all-electric

⁷⁹ Image found at https://www.pge.com/en_US/residential/rate-plans/rate-plan-options/tiered-base-plan/understanding-baseline-allowance.page#baselineamount.

⁸⁰ PU Code Section 739(c).

⁸¹ PU Code Section 739(b).

⁸² D.84-01-064 established a standard medical baseline allowance of 500 kWh per month for electricity. This amounts to approximately 16.5 kWh per day.

baseline is required by statute to be calculated at 60 to 70 percent of average residential consumption⁸³ during the winter heating season to account for increased reliance on electricity to provide space heating in colder months.⁸⁴

California is currently in the process of moving away from purely tiered rates in favor of new time-of-use (TOU) rates that charge customers according to what time of the day they consume electricity, though many of these TOU options continue to include a baseline credit in order to recognize differences in essential usage levels between different climate zones and to continue providing an energy conservation incentive for low usage customers. TOU rates are designed to discourage electricity consumption during peak demand hours⁸⁵ rather than discourage excessive electricity consumption overall. By encouraging customers to shift their electricity consumption from peak hours to off-peak hours, the overall costs for both the IOUs and their customers decrease due to less reliance on “peaker” power plants whose sole purpose is to serve increased load during a select few hours of the day. All non-residential customers are already on TOU rate plans, but residential customers are being transitioned gradually. All residential customers are currently anticipated to be transitioned to TOU rates by March 2022, but any residential customer can choose to transition ahead of schedule by contacting their IOU.

⁸³ For PG&E all-electric customers, 63.8% of average usage based on 2017 GRC Phase II decision (D.18-08-013); for SCE all-electric customers, 70% of average usage based on 2018 GRC Phase II decision (D.18-11-027); for SDG&E all-electric customers, 60% of average usage based on Residential Rate Reform proceeding decision (D.15-07-001).

⁸⁴ PU Code Section 739(a)(1).

⁸⁵ Standard peak demand hours for all three of California’s large electric IOUs are 4 PM to 9 PM every day of the week. However, some TOU rate plans have peak demand hours of 4 PM to 8 PM. Additionally, some TOU rate plans differentiate between off-peak demand hours and “super” off-peak demand hours, the latter affording customers lower prices than the former.

The move toward TOU rates does not make baseline quantities any less relevant. Even after the TOU transition process is complete, residential customers will still have the option to opt-out of TOU pricing and return to a version of their old purely tiered rates. For customers that remain on the default TOU rate schedules, baseline quantities will be used to adjust the time-dependent price per kWh that they are billed at in order to reflect differences in essential usage quantities that vary by climate zone.

Baseline quantities are only a non-factor for certain customers. Non-residential customers do not receive baseline adjustments of any kind. Among residential customers, certain rate plans primarily aimed at encouraging the adoption of electric vehicles, such as SCE's TOU-D-PRIME rate, do not adjust according to a baseline quantity. In lieu of baseline adjustments, SCE's TOU-D-PRIME rate includes a fixed daily charge averaging approximately \$12 per month that enables the provision of ultra-low pricing for off-peak consumption.⁸⁶ Similar rate plans were mandated for PG&E and SDG&E by D.20-03-003⁸⁷ and are in the process of being implemented.

4.2 CHALLENGES

While well intended, existing statutory requirements for how all-electric baseline allowances are currently calculated disadvantage genuinely all-electric IOU customers. As previously mentioned, state statute extends the all-electric baseline allowance to dual fuel customers who install electric space heating equipment. The electricity consumption of those dual fuel customers is pooled with the electricity consumption of customers taking no natural gas service for the purpose of calculating all-electric

⁸⁶ See: [https://www.sce.com/sites/default/files/inline-files/TOU-D-PRIME%20Fact%20Sheet_WCAG%20\(1\).pdf](https://www.sce.com/sites/default/files/inline-files/TOU-D-PRIME%20Fact%20Sheet_WCAG%20(1).pdf).

⁸⁷ See: <https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M329/K839/329839373.PDF>, Ordering Paragraphs 10 and 11, pp.51-52.

baseline quantities. A genuinely all-electric customer who uses electricity to power all his or her household appliances will typically have higher electricity usage than a customer with electric space heating who may not use electricity for water heating, cooking, or clothes drying. By pooling the two different customer types together for the purpose of calculating all-electric baseline quantities, the dual fuel customers with less electricity consumption will lower the all-electric baseline quantity, causing a distortion that disadvantages genuinely all-electric customers with higher electricity usage.

Complicating matters further is the fact that many “all-electric” IOU customers actually supplement their electricity consumption with propane usage.⁸⁸ The two large dual fuel IOUs currently offer the all-electric baseline allowance to any customer who does not take natural gas service⁸⁹ and do not inquire whether those customers use propane to power any of their household appliances.⁹⁰ These “all-electric” propane users have the effect of distorting the all-electric baseline allowance in a manner similar to those customers with only electric space heating in that they consume less electricity vis-à-vis genuinely all-electric customers.

Aside from being distorted, the current all-electric baseline allowances are also misaligned with California’s building decarbonization goals. According to the CEC’s

⁸⁸ Unlike private companies providing electricity and natural gas service, private companies providing propane service to residential households are not regulated by the CPUC unless that propane is provided via a distribution system serving 10 or more customers. See Chapter 4.1 of Division 2 of the PU Code for more information.

⁸⁹ Approximately 83.7% of PG&E’s customers currently receiving the all-electric baseline allowance are deemed eligible by nature of the fact that they do not take natural gas service. The corresponding figure for SDG&E’s customers is 84.9%. All other customers currently receiving the all-electric baseline allowance also take natural gas service and are eligible for the allowance due to the installation of electric space heating equipment.

⁹⁰ In contrast to the dual fuel IOUs, SCE physically inspects the premises of customers requesting the all-electric baseline allowance in order to ascertain eligibility. Customers found to be using a fuel other than electricity are deemed ineligible for the all-electric baseline allowance unless they are otherwise eligible due to the installation of electric space heating equipment.

2009 Residential Appliance Saturation Survey (RASS),⁹¹ space heating equipment accounts for 37% of all household natural gas consumption while water heating equipment accounts for a comparatively larger 49%.⁹² By extending the all-electric baseline allowance to dual fuel customers who install electric space heating equipment, but not to those who install electric water heating equipment, current rules and regulations fail to encourage fuel substitution for the single most emissions-intensive home appliance. As a result, dual fuel customers who install electric water heaters currently receive the same electric baseline allowance as customers who have natural gas water heaters. Given that electric water heating equipment uses a non-trivial quantity of electricity on a year-round basis, this results in consistently higher monthly electric bills. While customers may understand the incentives provided by the various programs approved by the CPUC to encourage fuel substitution, they may not be aware of the impact that installing electric water heating equipment could have on their monthly electric bills.

SCE recently studied several potential ways to remove rate impediments for dual fuel customers who install HPWHs. As part of the Residential and Small Commercial Rate Design Settlement Agreement in Phase II of their 2018 GRC,⁹³ SCE was required to submit a study on the applicability of all-electric baseline quantities to HPWH customers, which they provided in their most recent RDW filing.⁹⁴ The study looked at

⁹¹ An updated RASS is anticipated to be released later in 2020. When new RASS data is available, the figures cited by this Staff Proposal will need to be updated accordingly.

⁹² See: <https://ww2.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-V2.PDF>.

⁹³ A.17-06-030, Motion of Southern California Edison Company and Settling Parties for Adoption of Residential and Small Commercial Rate Design Settlement Agreement, Attachment A, Settlement Agreement, p. A-17.

⁹⁴ A.19-12-008.

the bill impacts of applying the all-electric baseline quantity to HPWH customers, as well as several alternative baseline modifications.⁹⁵

SCE found that while HPWH customers would experience net savings on an annual basis when given the all-electric baseline allowance, they would also experience greater bill volatility since the summer season baseline quantity is actually lower for all-electric customers compared to basic service customers in many climate zones. They also found that the amount of annual savings varies significantly between climate zones due to the wide range in winter season baseline quantities. For these reasons, SCE recommends against using the all-electric baseline for HPWH customers.

SCE also assessed the bill impacts for three alternative baseline quantities. The first of the three alternatives is an “incremental consumption allowance” based on 60% of the average residential usage for the subset of customers who have a HPWH. The second of the three alternatives is a similar “incremental consumption allowance” based on 70% of the average residential usage for the same subset of customers. The third of the three alternatives is an “incremental baseline option” in which the baseline would be adjusted upward to keep HPWH customers’ average rate unchanged with the addition of the incremental HPWH load as compared to the average basic service customer with no HPWH.

SCE’s analysis showed that all three options result in annual net savings without the bill volatility observed with the all-electric baseline and less variability across the various climate zones. The study found that the bill savings from the “incremental baseline option” (i.e., the third of the three alternatives) are about twice as large as the those from the 60% “incremental consumption allowance” (i.e., the first of the three alternatives): an annual savings of \$29 (1.7% bill reduction) for the third alternative

⁹⁵ SCE’s Testimony in Support of Its 2019 RDW Application, Section IV.

versus \$17 (1.0% bill reduction) for the first alternative when averaged across all climate zones. The 70% “incremental consumption allowance” (i.e., the second of the three alternatives) produced the greatest amount of savings at \$116 annually (7.0% bill reduction), though SCE notes that the additional baseline quantity provided by this option compared to the current basic service baseline is greater than the average load of a HPWH, meaning that this is an excessive baseline amount. SCE indicated a preference for the “incremental baseline option,” since it could be implemented without a statutory change. SCE also notes that the “incremental baseline option” would give customers an incentive to shift usage to lower cost periods if they are on a TOU rate.

If it is assumed that SCE’s preferred option, the incremental baseline, produces a similar annual savings of \$29 per customer in the rest of the state, the potential cost shift would be modest. Even if 20,000 customers were to take advantage of the modified baseline allowance, the overall cost shift would be less than \$600,000 annually across the entire state. This cost shift estimate can be evaluated more rigorously by the IOUs at the time they implement any baseline modification proposal.

4.3 PROPOSAL

Staff believes that, at a minimum, the CPUC should act to provide a higher baseline allowance for IOU customers who install electric water heating equipment. While PU Code Section 739(b) precludes the CPUC from extending the all-electric baseline allowance to any dual fuel customers other than those with electric space heating, PU Code Section 739(g) authorizes the CPUC to experiment with “alternative gas or electrical rate schedules for the purpose of achieving energy conservation.”⁹⁶

⁹⁶ See:

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=739.&lawCode=PUC.

Modern electric water heating equipment generally comes in the form of high efficiency HPWHs that achieve energy conservation both by reducing overall reliance on natural gas and by heating water mostly in the middle of the day rather than during peak hours, thus reducing the need for electricity provided by “Peaker” power plants while utilizing electricity when solar penetration is higher and the GHG intensity of each kWh consumed is lower.⁹⁷ As such, Staff finds it appropriate to create a new baseline allowance specific to electric water heating equipment.

SCE’s baseline study findings presented in its recent RDW filing form the basis for Staff’s recommendation. Staff agrees with SCE that any attempt to expand the definition of “all-electric residential customers” would need a statutory change and that providing an “incremental consumption allowance” for electric water heating that is greater than the average load of a HPWH would be overly generous. SCE’s preferred approach of the “incremental baseline option” is the most reasonable way of encouraging fuel substitution by providing a higher baseline allowance for customers who install electric water heating equipment.

All three of California’s large electric IOUs should be required to provide, as part of either their next GRC Phase II or RDW filings, incremental baseline adjustments for all customers who install electric water heating equipment. The proposal should be included in whichever filing is next, based on where each IOU is in their respective GRC cycles. The incremental baseline adjustments should include those customers who already qualify for an all-electric baseline allowance in order to further encourage fuel substitution and help correct the baseline distortion that genuinely all-electric IOU customers are currently subject to. GRC Phase II filings are an appropriate place to address this issue, as they are the forum in which an IOU’s approved revenue

⁹⁷ Ecotope’s Heat Pump Water Heater Electric Load Shifting: A Modeling Study. See: https://ecotope-publications-database.ecotope.com/2018_001_HPWHLoadShiftingModelingStudy.pdf.

requirement as established via GRC Phase I is translated into new rates. RDW filings would also be an appropriate venue for such a proposal, as these filings are where rate design issues that were not taken up in the most recent GRC Phase II can be addressed, and they are generally much shorter than GRC Phase II proceedings.

The three large electric IOUs are all in different stages of their respective GRC cycles. SCE recently concluded evidentiary hearings for its GRC Phase I and is due to submit its GRC Phase II application in Fall of 2021 (though this may be delayed depending on when a decision is issued for Phase I). PG&E submitted its GRC Phase II application in November 2019 and is expecting a Commission decision by September 2021 (parties requested a schedule that stretched past the 18-month requirement for ratesetting proceedings due to several uniquely challenging aspects of PG&E's application). SDG&E filed its GRC Phase II application in March 2019 and is expecting a decision this year. Given where each IOU is in their respective GRC cycles, SCE is the next utility that has an opportunity to include a baseline adjustment proposal in a GRC Phase II application. PG&E and SDG&E should address this topic in RDW filings.

Staff further recommends requiring interim measures be put in place to provide more immediate rate relief to customers who install electric water heating equipment so that those customers do not have to wait years in some cases for their IOU's next GRC Phase II to conclude. For example, the IOUs could calculate a good faith baseline allowance in a manner similar to the current medical baseline allowance by using average daily HPWH electricity consumption. All three large electric IOUs should be required to file a Tier III AL containing an implementation plan explaining how they each intend to provide rate relief in the near-term to customers who install electric water heating equipment. Those Tier III ALs should be required to be submitted no later than 30 days from the date of adoption of any new decision passed in response to this Staff Proposal.

Modifications to certain IOU billing systems anticipated to roll-out in early 2021 could complicate implementation of any near-term rate relief for customers who install electric water heating equipment. Both SCE and SDG&E are currently overhauling their billing systems (Customer Service Re-Platform, or “CSRP,” for SCE and Customer Information System, or “CIS,” for SDG&E) and, as a result, are trying to avoid any billing system changes until their new systems are in place and a stabilization period has passed. SDG&E recently filed a Request for Extension for implementation of the Disconnections OIR decision (D.20-06-003) noting that they plan “to complete the estimated 4 to 6-month stabilization period following CIS deployment in January 2021.”⁹⁸ In that same letter, SDG&E noted that SCE “is currently updating its Customer Service Re-Platform implementation, scheduled for early 2021, and requires a six-month stabilization period after system deployment.” Any solution that requires a billing system upgrade may need to be implemented manually until these stabilization periods have passed or delayed until stabilization is complete. All three large electric IOUs should specify in their Tier III AL filings how they can provide rate relief as expeditiously as possible for customers that install electric water heating equipment.

To help minimize distortions to current all-electric baseline quantities and also offset any potential cost shifting as a result of the new baseline allowance for customers who install electric water heating equipment, Staff recommends requiring all three large electric IOUs to follow SCE’s current practice of disallowing propane users from receiving the all-electric baseline allowance unless they otherwise qualify by having electric space heating equipment installed. PU Code Section 739(b) makes clear that, other than for dual fuel customers who install electric space heating equipment, all-

⁹⁸ Letter from Dan Skopec to Alice Stebbins dated July 1, 2020 re: REQUEST FOR EXTENSION TO IMPLEMENT RULES, CHANGES, AND CUSTOMER PROGRAMS MANDATED IN DECISION (D.) 20-06-003, ADOPTING RULES AND POLICY CHANGES TO REDUCE RESIDENTIAL CUSTOMER DISCONNECTIONS FOR THE LARGER CALIFORNIA-JURISDICTIONAL ENERGY UTILITIES.

electric baseline allowances are for customers “whose residential energy needs are currently supplied by electricity alone”⁹⁹ as opposed to customers who simply do not take natural gas service from an IOU. Combined with the fact that propane use distorts all-electric baseline quantities to the detriment of genuinely all-electric customers, it is logical that propane customers who do not otherwise qualify for a baseline adjustment should not be eligible to receive the all-electric baseline allowance simply because they do not take natural gas service. However, it would be complicated, costly, and unjust – especially amidst a recession and a global pandemic – to determine who amongst customers currently receiving an all-electric baseline allowance supplements their electricity usage with propane and then strip them of their allowance. Thus, Staff recommends that the disallowance be implemented on a prospective basis. In order to protect low-income customers to the fullest extent possible, Staff further recommends exempting CARE recipients who are “all-electric” and supplement with propane from being denied the all-electric baseline allowance unless the practice of the IOU already deems these customers ineligible, as is the case with SCE.

Determining which customers meet the current criteria to receive an all-electric baseline allowance, which customers use propane, and which customers have installed electric water heating equipment will require a new customer screening process. All three of the large electric IOUs should be required to ask all customers at the commencement or recommencement of service (1) whether the customer uses electric space heating equipment, (2) whether the customer uses electric water heating equipment, and (3) whether the customer uses propane to power their space heating

⁹⁹ See:

http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=739.&lawCode=PUC.

equipment, water heating equipment, cooktop,¹⁰⁰ or clothes dryer. Customers who answer ‘Yes’ to Question 1 will be eligible for an all-electric baseline allowance; customers who answer ‘Yes’ to Question 2 will be eligible for the new baseline adjustment specific to electric water heating equipment; customers who answer ‘Yes’ to Question 3 will be disqualified from receiving the all-electric baseline allowance unless they also answered ‘Yes’ to Question 1. The three large electric IOUs should explain how they intend to implement these changes – or modify existing screening processes, in the case of SCE – in each of their Tier III AL filings containing their implementation plans.

5 CONCLUSION

Several state agencies are currently in the process of assessing the potential for California to reduce its building sector GHG emissions by at least 40 percent below 1990 levels by January 1, 2030, as directed by AB 3232 (Friedman, 2018). The latest projections available indicate that meeting such an aggressive emissions reduction target will be challenging and likely require a portfolio of decarbonization strategies.¹⁰¹ This portfolio of decarbonization strategies includes the aggressive EE goals established by SB 350 (de León, 2015), the exploration of alternative in-pipe fuels such as renewable natural gas and hydrogen, and, most importantly, the electrification of new and existing

¹⁰⁰ “Cooktop” is intended to refer to a customer’s primary source of cooking fuel rather than a backyard propane grill that would only be used occasionally. Staff do not intend to preclude customers with backyard propane grills from being eligible for the all-electric baseline allowance if they would otherwise meet eligibility criteria.

¹⁰¹ June 9, 2020 Building Decarbonization: AB 3232- Fuel Substitution Scenario Analysis Tool (FSSAT) Commissioner Workshop 1 of 2, Slide 67. See: <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-DECARB-01>.

buildings.¹⁰² The CEC identifies building electrification as “practically, politically and economically feasible” over the relatively short timeframe between now and the start of the next decade.¹⁰³

This Staff Proposal advances three building electrification policies that will help achieve the AB 3232 building sector emissions reduction target. However, while the three policies proposed herein represent progress toward a portfolio of building decarbonization policies, Staff recognizes that this progress occurs in a time of great uncertainty for California and the rest of the world. The COVID-19 pandemic has forever changed the way in which Californians consume energy, with shelter-in-place orders and new telework arrangements leading to fewer office visits, more time spent at home, and changing load curves. Additionally, new wildfire mitigation costs, suppressed global demand for oil and natural gas, and the overarching state of the global economy will all have an impact on utility rates, building electrification economics, and broader building decarbonization policy decisions.

Despite the challenges ahead, the measures needed to achieve building decarbonization remain unchanged. This Staff Proposal would result in more efficient use of ratepayer dollars for appliance electrification through incentive layering, provide much needed financial support to further all-electric new construction after natural disasters, and ensure that ratepayers will benefit from the electrification of their water heating. When combined with the numerous other incentive programs approved and pending, Staff’s recommendations will help California achieve its climate goals and inform the future phases of R.19-01-011.

¹⁰² *ibid.*

¹⁰³ E3’s Deep Decarbonization in a High Renewables Future 2018 Report, p.68. See <https://www.ethree.com/wp-content/uploads/2018/06/Deep-Decarbonization-in-a-High-Renewables-Future-CEC-500-2018-012-1.pdf>.