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**SMUD Comments on Lead Commissioner Workshop Re 2022  
Energy Code Solar Photovoltaic and Heat Pump Baselines - 19-  
BSTD-03**

SMUD Comments on Lead Commissioner Workshop Re: 2022 Energy Code Solar  
Photovoltaic and Heat Pump Baselines - 19-BSTD-03

\*This document supersedes the document filed 12/23/2020.

*Additional submitted attachment is included below.*

**STATE OF CALIFORNIA  
BEFORE THE CALIFORNIA ENERGY COMMISSION**

<b>In the matter of:</b>	)	Docket No. 19-BSTD-03
	)	
<b><i>2022 Energy Code Pre-Rulemaking</i></b>	)	SMUD Comments on Lead
	)	Commissioner Workshop Re: 2022
	)	Energy Code Solar Photovoltaic
	)	and Heat Pump Baselines
	)	
	)	December 24, 2020

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**COMMENTS OF SACRAMENTO MUNICIPAL UTILITY DISTRICT  
ON LEAD COMMISSIONER WORKSHOP RE: PROPOSED 2022  
ENERGY CODE SOLAR PHOTOVOLTAIC AND HEAT PUMP  
BASELINES**

The Sacramento Municipal Utility District (“SMUD”) respectfully submits the following comments to the California Energy Commission (“CEC”) regarding the December 8, 2020 Workshop on 2022 Energy Code (“2022 Energy Code”).

SMUD appreciates the CEC’s leadership in prioritizing decarbonization in the 2022 Energy Code. There is a climate change crisis, and we encourage the swift implementation of known strategies that reduce greenhouse gas (GHG) emissions from fossil fuels and refrigerants. Electrification of most end uses of energy is the only known way for California to achieve its landmark 2030 and 2045 climate change goals. Building electrification combined with clean electricity is a critical component to meeting the state’s emissions and air pollution goals. Building electrification also has a lower first cost than gas construction and is cost-effective for consumers. As noted in our July 7, 2020 letter<sup>1</sup> submitted to this docket, SMUD strongly supports the CEC adopting an all-electric baseline for the 2022 Energy Code for residential and commercial buildings.

The inclusion of heat pump baselines and the option of community solar to meet proposed rooftop solar mandates are important elements in achieving building electrification. SMUD supports staff’s objectives as presented at the December 8 workshop and offers the following comments to assist staff in refining its proposals and working toward fair and effective regulatory structures.

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<sup>1</sup> <https://efiling.energy.ca.gov/GetDocument.aspx?tn=233801&DocumentContentId=66449>

## 1. Heat Pump Baselines

We appreciate the CEC's continued efforts to establish heat pump baselines that promote zero-emission electric construction. These efforts are critical to accelerating building decarbonization in alignment with California's broader emissions reduction goals. We also believe there are opportunities to further enhance the effectiveness of this effort, including the following:

- a. **The CEC should ensure the 2022 Energy Code does not hinder electrification in building types that have typically used central boilers for space heating.**

The CEC has not proposed heat pump baselines for large non-residential buildings that currently have a boiler system as the baseline space heating system type. Our understanding is that this is because heat pump boilers cannot yet be modeled accurately in the compliance software, and therefore the alternative baseline was found to increase Time Dependent Valuation (TDV).

However, continuing to set only a gas baseline in effect prevents the use of the performance path for these buildings, leaving the more costly and cumbersome prescriptive path for all electric buildings. This is currently a major challenge for builders wanting to implement advanced energy efficient electric solutions for these buildings, and an obstacle for local governments who are leading on building decarbonization through local codes.

We recommend the CEC further analyze alternative electric space heating baseline system types for medium and large office buildings to find a single all electric space heating baseline that meets cost-effectiveness criteria. While modeling capabilities for heat pump boilers need to be developed as soon as possible, in the meantime we recommend that the CEC consider a baseline of a variable air volume (VAV) system with electric reheat as the baseline system type for medium and large office buildings or a combination of measures that get to an appropriate TDV baseline.

Wherever a single electric baseline is not feasible, at a minimum we recommend that the CEC set dual electric and mixed fuel baseline. These independent baselines should, at a minimum, be fuel-neutral so as not to discourage efficient electrification.

- b. **We support staff's proposal to set electric baselines where feasible and cost-effective, and we recommend including additional building types that were not proposed in the December 8th workshop.**

Staff proposes to set heat pump baselines for small offices, mid- and high-rise multifamily buildings, small schools, and warehouses (office spaces only). We support moving these space heating baselines to all electric.

We also recommend that the CEC expand the proposed electric space heating baselines to all educational facilities and multifamily buildings. For multifamily buildings, the CEC's modeling has shown that electric space heating baselines are cost-effective for both mid- and high-rise multifamily. The CEC should set a single electric space heating baseline for all multifamily for consistency across this building type. Similarly, the CEC only presented results for small schools, for which the electric space heating baseline is cost-effective. We recommend that this electric space heating baseline be used for all educational facilities, given the predominance of all electric construction currently in this use type. For example, the University of California system requires all new buildings to be all electric.

**c. The CEC should strengthen the proposed electric space heating baselines to be based on a heat pump without gas supplemental heat in climate zones where it is cost-effective.**

The CEC has proposed to set the baseline as an electric heat pump with gas supplemental heat for many building types. This change is important, because without it all electric buildings will still have to adopt additional measures in order to beat the partially electrified baselines. The CEC's rationale for proposing heat pumps with gas supplemental heat as the baseline system type, as we understand it, is two-fold: 1) that electric supplemental heat will lead to increases in TDV (decreased efficiency) in some climate zones, and 2) that setting a fully electric heat pump baseline would result in a defacto gas ban due to the challenge for buildings, using gas, to meet the Time Dependent Source (TDS) energy metric. In other words, a building using gas will not be able to find enough efficiency measures to offset its increased carbon emissions.

In response to the first concern, we recommend that the CEC consider pairing the heat pump with electric supplemental heat baseline with complementary efficiency measures to address the climate zones with slight reductions in TDV (i.e., those with less than a 2% increase in TDV). For climate zones with larger increases in TDV (i.e., climate zone 16 for several building types), the CEC should separate the baseline system for just this climate zone.

In response to the second concern, we disagree that setting a fully electric space heating baseline would be an effective gas ban. This is because buildings could still comply via the prescriptive path which allows the use of gas for both space and water heating. The prescriptive path is used for many non-residential building projects today, and so setting a fully electrified space heating baseline would just limit those buildings wishing to make performance tradeoffs.

**d. The CEC should require buildings built with gas to be electrification ready.**

While some electrification-ready measures exist in the code today for water heating, they are limited and do not ensure that a building will have the needed infrastructure in place for future electrification. Given the need for almost all buildings to electrify to meet California's long-term emission reduction targets, new buildings today should

include the infrastructure that will enable drop-in electrification in the future. This will ensure that owners of buildings built with gas today won't be saddled with much higher retrofit costs later when those can be avoided for a fraction of the cost at the time of construction.

Key electrification-ready requirements should include:

- Require all in-unit multifamily gas equipment to incorporate an appropriately sized electrical circuit and dedicated slot(s) in the panel to power a direct replacement of the gas equipment. This should include cooking, space heating, clothes drying, fireplaces, and any in-unit water heating not captured in the current water heating readiness requirement.
- Expand current electrical readiness requirements to include a dedicated space for a storage heat pump water heater (HPWH) with plumbing connection stubs at the location. This is important because alternative gas water heaters are of the tankless type and are typically installed on an external wall or in a location that isn't suitable for a HPWH. Space and plumbing-ready requirements are critical to ensure full water heater electrification-readiness.

We recommend that staff review the memo sent to the California Department of Housing and Community Development on December 16, 2020 by the California Statewide Utility Codes and Standards Program team, attached for your reference. We feel this memo includes good recommendations for how to codify all-electric ready buildings in both low and high rise multifamily, single family and hotel/motel mixed fuel buildings.

## **2. Community Solar**

SMUD is committed to continuing to play a leadership role in the growth of renewable energy. For many years, we have provided vital assistance for the development and expansion of the rooftop solar industry. To date, over 210 megawatts (MW) of customer-owned rooftop solar have been installed in SMUD's service area and its energy portfolio currently includes over 170 MW of utility-scale solar. SMUD's recently adopted Integrated Resource Plan projects 550 MW of customer-owned rooftop solar by 2030 and more than 1,500 MW of utility-scale solar over the next 20 years, nearly 1,000 MW of which is to be built locally. Over the next two years, SMUD will add nearly 270 MW of new utility-scale solar and is currently exploring an additional 250 MW of local utility solar which could be online in 2024.

As part of its efforts to promote the use and availability of renewable energy within its service area, SMUD secured CEC approval on February 20, 2020 to administer the Neighborhood SolarShares (NSS) community solar program. Since then, SMUD staff has been working diligently to implement our NSS program.

Community solar provides housing developers with an alternative compliance method to meet the requirements of the 2019 Building Standards. There is no requirement that housing developers avail themselves of this compliance option. Instead, it just provides them with a choice.

SMUD expects that many developers will choose to install rooftop solar as a means to attract prospective homebuyers, and SMUD will continue to partner with those developers and rooftop solar installers to ensure an efficient interconnection process. That said, community solar supports the State's goal of encouraging the development of more affordable housing by providing a lower cost method of meeting the mandate while ensuring equivalent carbon reduction benefits.

At the December 8, 2020 workshop, CEC staff proposed several changes to the Community Solar program requirements. SMUD appreciates staff's collaborative approach to developing clarifying language for the community solar option in the 2022 Energy Code, and generally supports the staff proposals presented at the December 8, 2020 workshop. As the only CEC approved community solar administrator, we offer the following perspectives to assist with formulation of the proposed changes.

**a. Resource requirements**

**i. Location - distribution circuit serving the municipality or county**

SMUD is supportive of staff's interest in localizing the community solar systems to the communities such systems are intended to serve; however, utility service areas are not limited to local agency boundaries. Distinguishing locational requirements aligned with the utility service area rather than city or county boundaries will achieve staff's objective while recognizing the real-world utility system operation. We suggest proposed regulatory language that will align this approach with utility service areas. For example, SMUD's service territory encompasses most of Sacramento County but also includes portions of Placer and Yolo counties. While the distribution circuits serving our community solar customers may not always be contiguous with city or county boundaries, we believe a resource connected to distribution circuits within our service territory meets the proposed location requirements.

While SMUD commits to locating community solar resources for our NSS customers within our service territory, we do not believe that this constraint should necessarily be applied on a statewide basis. Other utility applicants may have smaller service territories making a service territory restriction too inflexible. Non-utility applicants may not have "service areas" in the same sense as a utility. It is also difficult to meet this location requirement in vast rural and densely populated urban areas.

**ii. Size – 20 MW or less**

SMUD also supports the proposed 20 MW or less size parameter for new community solar resources. 20 MW mirrors the maximum size limit for resources in the CPUC Green Tariff/Shared Renewables (GTSR) program and is consistent with the

parameters in the Coalition for Community Solar Access March 2019 publication “Community Solar Policy Decision Matrix”<sup>2</sup>, which recommends resources be within a utility service area and no more than 20 MW in size. We caution, however, that community solar program standards should be sufficiently flexible to allow projects sized to enable utilities to meet demand as it grows. SMUD will only retire RECs on behalf of the NSS program participants from **new** resources that are **20 MW or less**, unless there is program demand that cannot be met from these resources at a particular point in time.

**iii. New – developed for the community solar program; cover gaps with retired unbundled RECs**

SMUD likewise agrees that projects supporting community solar programs should be new projects, with gaps being covered with retired unbundled RECs. Although SMUD’s existing Feed-in-Tariff (FIT) resources are available to serve initial demand under the NSS program, SMUD’s new 13 MW Wildflower resource (commercial operation date (COD) is expected by the end of 2020) will replace the FIT resources and supply the NSS program until fully subscribed. Going forward, SMUD is committed to developing additional **new** resources, up to 20 MW each, to provide ongoing supply to the NSS program once Wildflower is fully subscribed.

**iv. New application if new resources are added (Executive Director review)**

SMUD supports the proposed Executive Director review and approval of amendments if resources are added to an existing community solar program. SMUD appreciates staff’s recognition that once a community solar program is approved by the CEC, a more streamlined process is appropriate to completing the review of additional resources serving the approved program. We believe such streamlined approach sufficiently addresses the need to confirm resource compliance with program standards while not adding unnecessary barriers to expanding the availability of solar energy for all. We encourage staff to work with utilities to ensure that the approval process is streamlined and aligns with the overall timeline of the new resource coming online.

**b. Program Requirements**

**i. Energy bill credit – clarify that benefits must exceed participation costs**

SMUD agrees that the benefit to community solar program customers should exceed the cost of participation. In making such assessment, it is critical that utility programs reflect the costs of providing services so that no one set of customers subsidizes another. This allows utilities to keep rates affordable for all of customers, including those that rent their homes, live in tree canopied neighborhoods, or cannot otherwise

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<sup>2</sup> <http://www.communitysolaraccess.org/wp-content/uploads/2019/04/2019CommunitySolarPolicyMatrix-2.pdf>, page 14



afford to install solar or purchase a new home. We note that publicly owned utilities like SMUD must also justify such program benefits as sufficiently cost-based to avoid the risk of violating the terms of Proposition 26.

**ii. Original Home Purchaser – option to install rooftop solar instead**

The community solar option adds choices for builders rather than restricting them, thereby increasing competition. SMUD agrees that community solar programs should allow builders who use this option for compliance to also offer the original home purchaser the option to install rooftop solar. Nothing in a community solar program should prevent the original home purchaser from installing on-site solar or on-site storage in the future.

**iii. Home Opt-out – anytime if Title 24 compliant rooftop system is installed at that time**

SMUD recognizes that there are restrictions on remaining sizing available to community solar customers for onsite solar to meet self-consumption needs. We believe there are cost effective approaches to address this issue in a way that allows for both community solar and on-site solar to co-exist. Any approach adopted should maximize the benefits of carbon reduction associated from the use of solar energy without creating additional regulatory burden. We look forward to continued dialog with staff on this issue.

In particular, SMUD requests that the CEC staff work with utilities to address the following underlying concerns:

**a. An opt-out option introduces uncertainty in a utility’s ability to plan for and execute contracts to supply a community solar program.**

While community solar administrators may have some flexibility in utilizing the solar resource(s) dedicated to support the program for other purposes, they are in fact procuring and constructing these systems specifically for the community solar program. Added to the current and proposed code requirements associated with the location, type, and size of community solar resources, an opt-out option introduces uncertainty in our ability to plan for and execute contracts to supply the NSS program as well as additional complexity to manage the accounting associated with the program.

**b. Community solar administrators as the providers of energy are not the entities responsible for code compliance.**

An opt out provision also creates compliance uncertainty. The nature and structure of the community solar option and program in fact ensures compliance and durability with the code over the full term of the 20-years. Rooftop solar does not and the community solar administrator cannot be substituted as the compliance manager for rooftop solar options. While a community solar administrator does require documentation to determine the capacity, size, and amount of solar energy required to meet Title 24

compliance for its program, it is not the agency that certifies compliance. This is typically the responsibility of the building department within each city or local jurisdiction where the residence is located. When an existing NSS customers wants to install rooftop solar, they need to acquire a permit from the local building department. That building department is best positioned to confirm Title 24 compliance. Simply allowing for an opt-out option for customers cannot ensure that a replacement rooftop system is compliant with code requirements.

**c. Replacement of solar energy to comply with the requirements of the code is not directly equivalent to on-site or rooftop system sizing, due to system generation efficiency differences.**

Should an Opt-Out requirement be adopted, it would trigger the need for updated modeling and new or updated documentation to track compliance with the solar requirements through onsite or rooftop PV. As stated above, community solar administrators are not the appropriate entities responsible for this process. The point of compliance is appropriately at the local jurisdiction or building department.

Additionally, it is unclear which version of Title 24 applies for customers that choose to opt-out at any time during the 20-year community solar program durability required by the code. Depending on the timing, the building codes would likely have been updated more than once. The CEC should clarify which version of the Energy Code would apply to a customer that opts out of a community solar program.

## **Conclusion**

SMUD strongly supports advancing the 2022 Energy Code by further prioritizing details that advance building decarbonization. Recognizing the urgency of climate change, we hope the CEC moves swiftly to head off the most critical impacts of this climate crisis. With the extensive data on climate, gas prices, electricity prices, and state policies in support of building decarbonization, updates to the 2022 Energy Code present a prime opportunity to keep pace with other statewide policies and climate goals.

As always, SMUD appreciates the opportunity to provide comments on the 2022 Energy Code. We look forward to working with the CEC to continue to advance efficient, all-electric construction and provide a community solar option as key elements in achieving the state's policy goals.

/s/

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cc: Corporate Files (LEG 2020-0192)

**To:** **California Department of Housing and Community Development**  
Brandon Estes  
Codes and Standards Administrator I

**From:** Chris Kuch, P.E.  
Codes and Standards Engineer – Title 24 & Reach Codes  
Southern California Edison  
on Behalf of California Statewide Utility Codes and Standards Program

**Date:** December 16, 2020

**Subject:** **Electric Infrastructure for Mixed-Fuel Buildings**

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## 1. Introduction

The Statewide Utility Codes and Standards (C&S) Program support achieving statewide energy and climate goals by advocating for new and revised appliance standards and building codes on the local, state, and national level. This includes recommending code changes for the California Green Building Standards Code (CALGreen or Title 24, Part 11). Three California Investor Owned Utilities (IOUs) – Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison – and two Publicly Owned Utilities – Los Angeles Department of Water and Power and Sacramento Municipal Utility District (herein referred to as the Statewide C&S Team) – sponsor this effort. The program goal is to prepare and submit proposals that would result in cost-effective enhancements to improve energy efficiency and energy performance in California buildings.

The Statewide C&S Team would like to thank the California Department of Housing and Community Development for the opportunity to present the following recommendation that mixed-fuel buildings be equipped with electric infrastructure, which will facilitate a change from gas or propane to electric equipment when the original equipment is replaced in the future. The Statewide C&S Team has supported many local jurisdictions as they have adopted similar language for reach code ordinances. Although many jurisdictions have opted to exclude natural gas entirely from many or all building types, including requirements to prepare for electrification reduces expected retrofit costs and allows the building owner or occupant to more easily make the switch in the future. In the 2022 California Energy Code (Title 24, Part 6), it has been proposed by the Energy

Commission to move towards an all-electric heating baseline, and electric-ready water heating requirements were added several code cycles ago. This proposal focuses on the remaining end uses likely to occur in a dwelling space. We look forward to working collaboratively with staff and other stakeholders to discuss this recommendation and refine the proposal as appropriate.

## 2. Recommended Express Terms

Express terms for the recommended code change are provided below with mark-up language provided as follows:

- Existing California amendments appear upright
- Amended or new California amendments appear underlined
- Repealed California language appears ~~upright and in-strikeout~~
- Ellipsis (...) indicate existing text remains unchanged

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### CHAPTER 2, DEFINITIONS

**MIXED-FUEL BUILDING** is a building that is plumbed for the use of natural gas or propane as fuel for space heating, water heating, cooking, clothes drying, or other building loads.

### CHAPTER 4, RESIDENTIAL MANDATORY MEASURES

#### DIVISION 4.1, PLANNING AND DESIGN

**Section 4.106.5 Electric Infrastructure for Mixed-Fuel Buildings.** Mixed-fuel buildings must comply with the following when gas or propane plumbing is installed for the specified end-use:

**4.106.5.1 Electric Infrastructure for Single Family Mixed-Fuel Buildings.**

**4.106.5.1.1 Electric Circuits for Space Heating.** A dedicated 240-volt, 30 amp or greater electrical circuit shall be provided that terminates within 3 feet from the heater or designated future location of an electric replacement heater with no obstructions into a listed cabinet, box, enclosure, or receptacle labelled “For Future Heat Pump Space Heater”. In the electrical panel the circuit shall be served by a dedicated double pole circuit breaker or a single pole circuit breaker with a reserved single pole circuit breaker space adjacent, and shall be labeled with the words “For Future Heat Pump Space Heater”; and

**4.106.5.1.2 Electric Circuits for Combined Cooktop/Oven, Stand-Alone Cooktop, and Stand-Alone Oven.** A dedicated 240-volt, 50 amp or greater circuit shall be provided that terminates within 3 feet of all combined or stand-alone cooking equipment with no obstructions into a listed cabinet, box, enclosure, or

receptacle labelled “For Future Electric Cooking”. Each circuit shall be served by a dedicated double pole circuit breaker in the electrical panel labeled with the words “For Future Electric Cooking”; and

**4.106.5.1.3 Electric Circuits for Clothes Dryer.** A dedicated 240-volt, 30 amp or greater electrical receptacle shall be provided within 3 feet of the clothes dryer location and accessible with no obstructions. The circuit shall be served by a double pole circuit breaker in the electrical panel labeled with the words “For Future Electric Clothes Dryer”.

#### **4.106.5.2 Electric Infrastructure for Multifamily and Hotel/Motel Mixed-Fuel Buildings.**

**4.106.5.2.1 Electric Circuit Capacity.** For the following end-uses where gas or propane plumbing is installed, mixed-fuel buildings shall have conductors or raceway installed with termination points at the main electrical panel (via subpanels panels, if applicable) into a listed cabinet, box or enclosure and at a location no more than 3 feet from each gas outlet or a designated location of future electric replacement equipment. Both ends of the conductors or raceway shall be labelled appropriately to indicate the type of future electric replacement equipment. The conductors or raceway and any intervening subpanels shall be sized to meet the future electric power requirements, as specified below, at the service voltage. The capacity requirements may be adjusted for demand factors in accordance with the California Electric Code, Title 24, Part 3, Article 220. Gas flow rates shall be determined in accordance with the California Plumbing Code, Title 24, Part 5, Section 1208.4.

**4.106.5.2.1.1 Domestic Hot Water Circuit Capacity.** Domestic hot water systems shall comply with the following:

1. For equipment serving multiple dwelling units, common areas, or nonresidential space:
  - a. 24 amps at 240 volts per dwelling unit, or
  - b. 1.2 kVA for each 10,000 Btus per hour of rated gas input or gas pipe capacity, or
  - c. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.1.2 Space Heating Circuit Capacity.** Space heating systems shall comply with either:

1. Equipment serving individual dwelling units shall have a dedicated 240 volt, 30 amp or greater electrical circuit for a future electric replacement heater.

2. For equipment serving multiple dwelling units, common areas, or nonresidential space:
  - a. 24 amps at 240 volts per dwelling unit, or
  - b. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**EXCEPTION to Section 4.106.2.1.2** If permanent space cooling equipment is installed for all of the affected conditioned space the conductors or raceway serving the cooling equipment may be increased in size to accommodate the future electric space heating equipment.

**4.106.5.2.1.3 Clothes Dryer.** Clothes dryer infrastructure shall comply with either:

1. For systems serving individual dwellings, a dedicated 240 volt, 30 amp or greater electrical receptacle shall be provided within 3 feet of the clothes dryer location and accessible with no obstructions.
2. For equipment serving multiple dwelling units or common areas
  - a. 24 amps at 240 volts per dwelling unit, or
  - b. 0.85 kVA for each 10,000 Btus per hour of rated gas input or gas pipe capacity for commercial dryers; or
  - c. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.1.4 Cooking Equipment.** Cooking equipment infrastructure in residential spaces shall comply with either:

1. For equipment serving individual dwelling units, a dedicated 240 volt, 50 amp or greater circuit and 50 amp or greater electrical receptacle shall be provided within 3 feet of the cooktop and oven and accessible with no obstructions, or
2. For equipment serving common space or nonresidential spaces, the electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.1.5 Pools and Spas** shall comply with either:

1. 0.75 kVA per 10,000 Btus per hour of rated gas input or gas pipe capacity, or

2. The electrical power required to provide equivalent functionality of the gas-powered equipment as calculated and documented by a licensed design professional associated with the project.

**4.106.5.2.2 Service Capacity.** Mixed-Fuel Buildings shall comply with the following:

**4.106.5.2.2.1 Overcurrent protection and bus bar capacity.** All newly installed electrical panels and subpanels in Mixed-fuel Buildings shall have physical space for overcurrent protective devices and bus bars of adequate capacity in the main electrical panel and any subpanels to meet all of the building's potential future electrical requirements as specified in Section 4.106.5.2.1.

**Exception to Section 4.106.5.2.2.1** If the electric load serving entity requires that the electric service be upgraded as a result of the requirements of Section 4.106.5.2.2.

**4.106.5.2.2.2 Raceway sizing.** All newly installed raceways in a Mixed-Fuel Building between the main electric panel and any subpanels, and the point at which the conductors serving the building connect to the common conductors of the utility distribution system, shall be sized for conductors adequate to serve all of the building's potential future electric loads as specified in Section 4.106.5.2.1.

**4.106.5.2.4 Condensate Drains.** The conductors or raceway required in Sections 4.106.5.2.1.1 and 4.106.5.2.1.2 shall terminate in areas that have condensate drains that are:

1. No less than ¾ inch in diameter;
2. Compliant with the California Plumbing Code, Title 24, Part 5, Section 814; and
3. No more than two inches higher than the floor.

**4.106.5.2.5 Water Heating Space for Equipment**

1. Individual Residential Units. The conductors or raceway required in Section 5.508.31.1 shall terminate in an area that is at least three (3) feet by three (3) feet by seven (7) feet high.
2. Multiple Residential Units. Construction documents shall indicate the physical space necessary and reserved for future heat pump water heating equipment, including future equipment footprint and a future pathway reserved for routing of ductwork from the outside to the heat pump evaporator. The footprint necessary for future heat pump water heating equipment may overlap with non-structural partitions.



### 3. Rationale

#### **Chapter 2, DEFINITIONS**

##### **ALL-ELECTRIC BUILDING**

Rationale: The purpose of this change is to define an all-electric building, as fuel type determines the appropriate Total EDR Target in Appendix A4.

##### **MIXED-FUEL BUILDING**

Rationale: The purpose of this change is to define a mixed-fuel building, as the proposed change for Chapter 4 adds requirements specifically for these buildings.

#### **Chapter 4, RESIDENTIAL MANDATORY MEASURES, DIVISION 4.1, PLANNING AND DESIGN**

##### **Electric Infrastructure for Mixed-Fuel Buildings.**

Rationale: The purpose of this change would require the installation of the necessary electric infrastructure during new construction to facilitate a change from gas or propane to electric equipment when the original equipment is replaced in the future. This code change complements revisions to Title 24, Part 6 that the California Energy Commission is considering a shift to electric baselines and encourage all-electric construction. This mandatory requirement is necessary to ensure that the proper infrastructure is in place at the time of equipment replacement. It will aid California in reducing statewide building related GHG emissions to a level at least 40 percent below 1990 levels by 2030, as directed by AB 3232.