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**California Public
Utilities Commission**

EE Natural Gas Incentive Phase Out Staff Proposal

ENERGY DIVISION STAFF

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Acronyms & Abbreviations

AB	Assembly Bill
ACC	Avoided Cost Calculator
AGIC	Avoided gas infrastructure cost
AR	Accelerated replacement
ASM	Assembly
BUILD	Building Initiative for Low-Emission Development
CalPA	Public Advocates Office
CARB	California Air Resources Board
CEC	California Energy Commission
CEDARS	California Energy Data and Reporting System
CEDMC	The California Efficiency + Demand Management Council
COP	Coefficient of performance
CPUC	California Public Utilities Commission
C&S	Codes and standards
CZ	Climate zone
dMo	Residential mobile home
ED	Energy Division
EE	Energy efficiency
eTRM	California Electronic Technical Reference Manual
EUL	Effective useful life
GHG	Greenhouse gas
HSPF	Heating seasonal performance factor
IOU	Investor-owned utility
IEPR	Integrated Energy Policy Report
NC	New construction
NMEC	Normalized metered energy consumption
NR	Normal replacement
NRDC	Natural Resource Defense Council
PA	Program administrator

PAC	Program administrator cost test
PG&E	Pacific Gas and Electric Company
PPP	Public Purpose Programs
SB	Senate Bill
SCE	Southern California Edison Company
SCG	Southern California Gas Company
SDG&E	San Diego Gas & Electric Company
SEER	Seasonal energy efficiency rating
TRC	Total resource cost
TSB	Total system benefit

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1 Summary and Introduction

1.1 Summary

This staff proposal suggests an orderly transition to phasing out ratepayer-funded energy efficiency (EE) incentives for most natural gas measures over the next 10 years. Section 2, Policy Rationale for Staff Proposal, details what led to this proposal, including the Sierra Club’s motion filed in January of 2022, as well as the general trends in EE codes and standards (C&S) and appliance standards. Section 3, Staff Proposal, goes into the details of the proposal, which includes separate timelines and policies for new construction (NC), retrofits, and custom projects. This section also explains what is meant by “viable electric alternative” and “exempt measures” in our proposal and how they relate to EE incentives for gas measures. The final parts of Section 3 discuss how cost effectiveness could be measured for the relevant steps of this proposal, as well as how the EE Potential and Goals Study will fit into the proposed policy. Section 4 discusses the affordability aspects of phasing out most natural gas EE incentives in favor of electrification, including its impact on customer utility bills and a discussion of ways to think about this. The section notes the implications of this proposal on the public purpose program (PPP) charges for investor-owned utility (IOU) customers and discusses expanding the effective useful life (EUL) of insulation and other measure that save but do not burn natural gas. Section 5 lists the areas of specific interest for CPUC staff to receive feedback from stakeholders in response to this staff proposal.

1.2 Introduction

California has set ambitious goals to mitigate the impacts of climate change, including goals to limit greenhouse gas (GHG) emissions and decarbonize the economy. Among other statutes, Assembly Bill (AB) 3232 (Pavley, 2016) brought about an assessment of California’s potential to reduce GHG emissions from the residential and commercial building stock to 40 percent below 1990 levels by 2030, and Senate Bill (SB) 100 (de Leon, 2018) establishes a target of serving Californians with 100 percent renewable and zero carbon electricity by 2045. To meet the state’s goals, bold action is needed to decarbonize the electric sector, and EE has an important role to play in that transition. It is with this in mind that the California Public Utilities Commission (CPUC) Energy Division (ED) proposes an orderly and gradual transition away from using IOU ratepayer funds to incentivize natural gas EE measures.

Specifically, this staff proposal responds to a motion from the Sierra Club, submitted to the CPUC in Rulemaking 13-11-005 on January 13, 2022. We split the proposed policy into four tracks, one for NC, for retrofits, one for custom projects, and one for normalized metered energy consumption (NMEC) programs.¹ NC has the fastest timeline, focusing first on non-cost effective natural gas appliances in all sectors and portfolio segments, then by program year (PY) 2028 expands to all non-exempt natural gas measures with a viable electric alternative. We define exempted gas measures as those, such as insulation and building weatherization, which produce gas savings but do not burn natural gas, and also support the state's decarbonization goals. For retrofits, the staff proposal starts by focusing on the resource acquisition segment of EE portfolios for gas appliances in the residential and commercial sectors that are not cost-effective. The policy would then expand incrementally through a total of four steps to include all gas measures in all portfolio segments and all sectors that have a viable electric alternative, and that have not been exempted. For custom projects, this policy would weight incentives to favor electrification, where possible. For NMEC programs, the policy is similar to custom projects in that it weights incentives in favor of electrification for gas components of NMEC program projects.² To assess whether a natural gas measure has a viable electric alternative, we use three questions that assess whether an electric measure exists for a specific end use, as well as the cost of the electric alternative. By taking an incremental approach to this policy, the CPUC will allow EE Program Administrators (PA) and implementers to ramp-down existing programs and re-structure portfolios accordingly and adapt to this new policy landscape.

¹ Retrofits are EE measures that are used in existing buildings. Custom projects are site-specific EE projects, such as those used for large industrial processes.

² NMEC program projects are energy efficiency projects that use an existing conditions baseline and leverage pre- and post-retrofit energy consumption data analysis to determine savings. NMEC program projects must adhere to the CPUC's NMEC Rulebook <https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/n/6442463694-nmec-rulebook2-0.pdf>

2 Policy Rationale for Staff Proposal

2.1 Sierra Club Proposal

On January 13, 2022, the Sierra Club filed a motion in R.13-11-005 requesting that the CPUC cease funding non-cost effective natural gas appliances. The motion stated that the majority of natural gas appliances that receive EE incentives are not cost effective, that providing incentives for these measures runs counter to the state's climate goals, and that providing these incentives is not aligned with the policy intent of allowing non-cost effective measures in PAs' EE portfolios. The Sierra Club also asserted that incentivizing these non-cost effective natural gas measures is locking in the emissions from those measures for years or decades to come, and that continuing to install those measures is merely postponing the inevitable as those measures would need to be replaced with electric alternatives eventually to meet the state's goals.

Seven parties filed comments on Sierra Club's motion, with three supporting (California Public Advocates Office (CalPA), Natural Resource Defense Council (NRDC), and Southern California Edison Company (SCE)), three opposing (The California Efficiency + Demand Management Council (CEDMEC), joint comments from San Diego Gas & Electric Company (SDG&E) and Southern California Gas Company (SCG), and joint comments from Bay Area Regional Energy Network (BayREN), Tri-County Regional Energy Network (3C-REN), and the County of Ventura), and Pacific Gas and Electric Company (PG&E) neither opposing nor supporting.

2.2 Proposed and Existing EE Portfolios

In analyzing Sierra Club's motion, CPUC staff reviewed existing and proposed EE portfolios to assess the parameters of natural gas measures receiving incentives. This review reveals that a significant percentage of funding for gas EE goes to measures that are not cost-effective. An examination of California Energy Data and Reporting System (CEDARS) 2020 filing budget and claims data shows that a significant portion (44 percent) of the gas EE filing budget across all PAs went to measures that are not cost-effective. It also shows that by far the largest categories of measures that are non-cost effective are appliances (19 percent of the 44 percent, or 8.4 percent of the gas EE budget). These measures are almost entirely centralized in the residential and commercial sectors, with these two sectors making up almost 90 percent of

the non-cost-effective gas measures filing budget. Most of these non-cost effective appliances are far from being cost-effective – the “plug load and appliance” program group, which is the largest appliance group, has a total resource cost (TRC) of 0.6. These same trends are reflected in the 2020 CEDARs claim data.

Additionally, there is stakeholder support to move towards a phase-out of EE incentives for natural gas measures. A number of PAs expressed support for phasing out natural gas EE incentives and for the state’s decarbonization and electrification goals in their EE applications proposed for the 2024-2027 program cycle, which were recently filed with the CPUC. For example, PG&E stated that it wants to remove financial support for natural gas from its portfolio, except where there are no viable alternatives.³ SCE echoed this sentiment in recommending “that the Commission not permit energy efficiency funds to be spent on gas appliance incentives if a similar electric measure is reasonably commercially available and can demonstrate a reduction in greenhouse gas emissions.”⁴ MCE also plans to focus on electric measures in its portfolio and “eventually phase out gas measures.”⁵ Because of the broad and strong support for phasing out gas EE incentives, the policy direction in this staff proposal is also in line with many stakeholders’ views on the future of EE funding.

2.3 Trends in California Building Code and Appliance Standards

The trend of California building codes and appliance standards supports the Sierra Club’s motion to deemphasize non-cost-effective natural gas incentives. In the 2021 Natural Gas Research and Development Program Staff Report, the California Energy Commission (CEC) stated that the role of natural gas in the energy system will need to be re-evaluated as California pursues emissions reduction targets. Natural gas is currently an important component of the energy system and will likely continue to be in the future, but CEC research priorities do not include pursuit of natural gas efficiency opportunities for short- and medium-term decarbonization, reflecting the observation that state goals and market trends do not support a prioritization of efficient natural gas appliances.

³ PG&E Application A.22-02. “Pacific Gas and Electric Company Energy Efficiency 2024 Business-Portfolio Plan: PG&E Energy Efficiency 2024-2031 Strategic Business Plan – Prepared Testimony - Exhibit 1.” February 15, 2022. Page 1-17.

⁴ SCE Application A.22-030-SCE-01. “Testimony in Support of Southern California Edison Company’s Application for Approval of its Energy Efficiency Business Plan for 2023-2031, Volume 1 – Business Plan.” March 4, 2022. Page 53.

⁵ MCE Application 22-03. “TESTIMONY REGARDING 2024-2031 BUSINESS & PORTFOLIO PLAN EXHIBIT 1 ENERGY EFFICIENCY BUSINESS PLAN 2024-2031.” March 4, 2022. Page 2-4.

Similarly, the CEC's 2021 Integrated Energy Policy Report (IEPR) acknowledged the diminishing returns of natural gas efficiency incentives. The CEC states that highly efficient gas appliances currently deliver returns of GHG savings compared to less-efficient alternatives. However, appliances like water heaters and HVAC systems operate for between 10 and 20 years. State goals intend to achieve deep carbon reductions in the first or second replacement of all existing equipment. This implies an increasing likelihood that new gas equipment will become stranded assets, removing the chance for electrification, and increasing the likelihood that the state will fail to reach its goals. Rather than focusing on incentivizing emitting appliances, the CEC recommends pursuing gas efficiency programs that focus on building insulation, duct work, and sealing.

In the 2022 Energy Code, the CEC included a greater focus on electrification readiness (CEC Resolution 21-0811-4b). For single-family homes, the CEC set the performance standard baseline for space and water heating based on the assumption that the home will use heat pumps. The CEC included heat pumps in the performance standard baseline for multi-family homes as well, in addition to some commercial buildings. Furthermore, all new single-family homes were required to have dedicated circuits and other upgrades that would facilitate a simpler transition to all-electric appliances. In instances where developers decide to include gas stoves, water heaters, or heating, ventilation, and air conditioning (HVAC) systems, developers are required to have 240-volt outlets available for future electric replacements. These code modifications show a clear trend towards all electric new construction in the residential space, and a prioritization of electric alternatives for retrofits.

3 Staff Proposal

The following section outlines a proposal to phase out EE incentives for natural gas over 10 years. The steps for each of the four EE categories are structured primarily around the CPUC's EE Business Plans Application process. However, using program year (PY) 2024 as the implementation date for the first step of these proposed policies also aligns with year chosen by the CEC for the potential phase out of EE natural gas measures in favor of higher levels of fuel substitution measures in its high electrification SB 350 scenarios last year.

3.1 New Construction

Constructing new buildings with gas appliances and equipment further expands the state's gas infrastructure and installs gas measures that will likely have to be replaced with electric alternatives in the future in order to meet the state's climate change goals. Research has also shown that some of the most promising near term-term cost savings for residential consumers are in all-electric new construction (NC).⁶ The CPUC has already signaled its preference for all electric NC with policies such as the Building Initiative for Low-Emission Development (BUILD) program⁷ and the avoided gas infrastructure cost (AGIC) for EE, which has now been expanded to all demand side resources in the 2022 Avoided Cost Calculator (ACC). This staff proposal seeks to further signal this priority by phasing out EE incentives for non-exempt gas measures with a viable electric alternative in NC by PY 2032, at the end of the second program cycle in the EE Business Plans Applications filed in February and March of 2022, pending CPUC disposition.

⁶ [E3 Residential Building Electrification in California April 2019.pdf \(ethree.com\)](#) (p8)

⁷ BUILD is a building decarbonization initiative established by Senate Bill (SB) 1477 (Stern, Chapter 378, Statutes of 2018) that will provide technical assistance and financial incentives for new, low-income residential building projects using near-zero-emission building technologies

Table 1 – Timeline for phasing out EE natural gas incentives for new construction

Step	Implementation Date	Sectors	Affected Measures	CE Threshold	Portfolio Segment(s)
1	PY 2024	Residential Commercial Industrial Agricultural	Non-CE gas appliances with a viable electric alternative	Measure = TRC < 1 Program = TRC < 1 if more than 80% of projected program energy savings from gas appliances.	Resource acquisition Equity Market Support
2	PY 2028	Residential Commercial Industrial Agricultural	All non-exempt gas measures with a viable electric alternative.		Resource acquisition Equity Market Support

Step 1 – Beginning with the current EE Business Plans Applications review process and implemented starting in program year (PY) 2024, the CPUC would no longer authorize NC EE programs that provide ratepayer funded EE incentives to non-cost effective gas measures that have a viable electric alternative for all sectors and all segments of a PA’s EE portfolio. Non-cost effectiveness for these purposes is defined as a measure that has a TRC of less than 1, or a program that has a TRC of less than 1 where 80 percent of the projected program energy savings come from gas appliance measures. Existing contracts that fund these measures or programs would be allowed to complete their current contract period but would not be renewed. No contracts that support non-cost effective gas appliance measures with a viable electric alternative in any portfolio segment would be allowed to extend past PY 2027. Appliances for this policy would be defined as any measure in the HVAC, water heating, or app plug technology type category in CEDARs, excluding smart thermostats, faucet aerators, and building envelope measures (for the purposes of this policy, these are considered exempt measures).

Step 2: Starting with the second program cycle in the upcoming business plan cycle, in PY 2028, this step would move beyond Step 1 into a policy of no longer allowing EE ratepayer incentives to be given for non-exempted gas NC measures that have a viable electric alternative. This means that for all sectors and segments of the EE portfolio, EE incentives would no longer be allowed for any gas measure, regardless of cost-effectiveness, that has a viable electric alternative and has not been exempted because of its alignments with the state’s decarbonization goals.

3.2 Retrofits

Staff proposes accomplishing an orderly transition away from EE incentives for natural gas retrofit measures over 10 years and across four steps, detailed below. At a high level, the steps will begin during this year’s EE Business Plans Applications review process and be implemented starting in 2024 with Step 1

largely reflecting the Sierra Club motion of not approving any new – or renewing any existing – EE programs that use ratepayer funds to incentivize non-cost-effective natural gas appliances for which there is a viable electric alternative. Step 2 would begin at the start of the second program cycle in the current EE Business Plans Applications, in PY 2028. This step would expand the prohibition on using ratepayer funds to all gas appliances in the residential and commercial sectors that have a viable electric alternative or are not exempt, whether or not they are cost effective. Step 3 would come into effect in 2030 and expand the restriction on funding non-cost-effective gas appliances to the agricultural and industrial sectors. Finally, Step 4 would prohibit EE incentives for use in all gas measures that have a viable electric alternative or are not exempt across all sectors, starting with the next Business Plan cycle in 2032.

Table 2 – Timeline for phasing out EE natural gas incentives for retrofits

Step	Implementation Date	Sectors	Affected Measures	CE Threshold	Portfolio Segment(s)
1	Summer 2022	Residential Commercial	Non-CE gas appliances with a viable electric alternative	Measure = TRC < 1 Program = TRC < 1 if more than 80% of projected program energy savings from gas appliances.	Resource acquisition
2	PY 2028	Residential Commercial	All gas appliance measures with a viable electric alternative		Resource acquisition Equity Market Support
3	PY 2030	Residential Commercial	All non-exempt gas measures with a viable electric alternative		Resource acquisition Equity Market Support
		Industrial Agricultural	Non-CE gas appliances with a viable electric alternative	Measure = TRC < 1 Program = TRC < 1 if more than 80% of projected program energy savings from gas appliances.	Resource acquisition
4	PY 2032	Residential Commercial Industrial Agricultural	All non-exempt gas measures with a viable electric alternative.		Resource acquisition Equity Market Support

Step 1 – Beginning with the current EE Business Plans Applications review process and implemented in PY 2024, the CPUC would no longer authorize new EE programs that provide ratepayer funded EE incentives to non-cost effective gas appliance measures in the residential or commercial sectors of the resource acquisition segment of a PA’s EE portfolio. Non-cost effectiveness for these purposes is defined as a measure that has a TRC of less than 1, or a program that has a TRC of less than 1 where 80 percent of the

projected program energy savings come from gas appliance measures. Existing contracts that fund these measures or programs would be allowed to complete their current contract period but would not be renewed. No contracts that support non-cost effective gas appliance measures with a viable electric alternative in any portfolio segment would be allowed to extend past program year 2027. Appliances for this policy would be defined as any measure in the HVAC, water heating, or app plug technology type category in CEDARs, excluding smart thermostats, faucet aerators, and building envelope measures (for the purposes of this policy, these are considered exempt measures).

Step 2 – The implementation of Step 2 would coincide with the beginning of the second portfolio period in this Business Plan cycle. Starting in program year 2028, this step would expand upon Step 1 to eliminate EE ratepayer incentives to all gas appliances with a viable electric alternative in the commercial and residential sectors of all segments of PAs’ EE portfolios, regardless of cost effectiveness. However, it would exempt measures, such as building envelope and weatherization measures, that align with the state’s decarbonization goals. Whereas Step 1 would only affect non-cost-effective residential and commercial gas appliance measures in the resource acquisition segment of PAs’ portfolios, Step 2 would expand to also include the equity and market support segments. Any ongoing contracts that included non-cost-effective gas appliance measures would have to be stopped before the start of program year 2028.

Step 3: Starting halfway through the second portfolio period of this Business Plan cycle, in 2030, Step 3 would build upon the previous steps by stopping EE ratepayer incentives for non-cost-effective gas appliances that have viable electric alternatives in the industrial and agricultural sectors in the resource acquisition segment of PAs’ portfolios. Non-cost effectiveness in this step will be defined the same way as in Step 1 – a measure that has a TRC of less than 1, or a program that has a TRC of less than 1 where 80 percent of the projected program energy savings come from gas appliance measures. This step would build on Step 2 for the residential and commercial sectors by expanding to include all gas measures with a viable electric alternative that have not been exempted because they align with the state’s decarbonization goals (insulation, weatherization, etc.).

Step 4: Starting with the initiation of the next business plan cycle, in 2032, this step would mark the end of EE ratepayer incentives for non-exempted gas measures that have a viable electric alternative. This means that for all sectors and segments of the EE portfolio, EE incentives would no longer be allowed for any gas measure, regardless of cost-effectiveness, that has a viable electric alternative and has not been exempted because of its alignments with the state’s decarbonization goals.

3.3 Custom Projects

This proposal suggests that the policy of working towards an orderly transition away from EE incentives for natural gas measures also apply to custom projects. While we recognize that custom projects can include specific processes that require heat or other properties that can only be realistically addressed using natural gas, we also recognize that achieving the state’s decarbonization goals means that electrification must occur across the entirety of EE portfolios, including in custom EE projects. Because of the unique nature of custom projects, the determination of which processes involved in a custom project may not have a viable electric alternative would need to be demonstrated on a case-by-case basis by the project developer and reviewed by the PA.

To avoid being overly prescriptive and to allow for innovation, this proposal suggests that the CPUC begin to phase in a policy of weighting incentives for electric savings more highly than those for gas savings for custom projects that are determined to be feasible for electrification. This will incentivize applicants and implementers to craft custom projects in ways that prioritize electrification, where possible. This weighted approach to custom incentives would follow the same timeline as the four-step incremental approach used for deemed measures, detailed above. The four steps in this process for custom measures are shown in the following table.

Table 3- Timeline for incentive weighting for custom projects with electrification potential

Step	Implementation Date	% Change of Electric Incentive	% Change of Gas Incentive
1	PY 2024	25%	-25%
2	PY 2028	50%	-50%
3	PY 2030	75%	-75%
4	PY 2032	100%	-100%

3.4 Normalized Metered Energy Consumption (NMEC) Programs

Staff proposes an orderly transition away from natural gas incentives for Normalized Metered Energy Consumption (NMEC) program projects. Specifically, staff proposes that the transition for NMEC projects would consist of two stages and only apply to the gas aspects of NMEC projects. In stage 1, gas measures with a viable electric alternative in NMEC projects would receive 50 percent of the incentives that they have

historically received. The incentive dollars being taken away from the gas measures would be redirected to bolster incentives for electrification measures, yielding an increase in NMEC incentives for electrification measures relative to historical levels. Stage 1 would begin in PY 2024. In stage 2, starting in PY 2026, incentives would no longer be given to gas measures in NMEC projects that have a viable electric alternative. The incentive dollars being taken away from the gas measures would be redirected to incentives for electrification measures. This two-stage approach is summarized in Table 4 below.

Table 4- Timeline for incentive weighting for NMEC projects with electrification potential

Step	Implementation Date	% Change of Electric Incentive	% Change of Gas Incentive
1	PY 2024	+50%	-50%
2	PY 2026	+100%	-100%

3.5 What is an “exempt measure?”

Exempt measures, for purposes of this policy, would be defined as measures that result in gas savings, but do not burn gas. Examples of these measures include, but are not limited to, building insulation, sealing, smart thermostats, faucet aerators, and building envelope measures such as windows.

3.6 What is a “viable electric alternative?”

The phasing out of EE ratepayer incentives for gas measures would only apply to those gas measures that have a viable electric alternative, or are not exempt. In other words, the CPUC would continue to incentivize gas measures that cannot reasonably be replaced with an electric alternative. Whether or not a gas measure has a viable electric alternative would be determined through a three-part test. Using these set criteria for determining whether or not specific gas measures have a viable electric alternative will allow PAs and implementers to plan their programs and adjust to the general phase out of natural gas EE incentives over time with a level of predictability and clarity. The three questions in this test would be as follows:

1. Is there an electric alternative to the gas measure that has the same end use in any eTRM measure package?⁸
2. Is the measure package for the electric alternative substituting either from a natural gas baseline to electric, or from a mixed-fuel (natural gas and electric) baseline to electric?
3. Is the sum of the labor and materials costs, as recorded in the eTRM permutations table, for the electric alternative no more than 116 percent greater than of the sum of the labor and materials costs for the baseline gas measure?

The answers to these questions would be required to be based on approved measure packages in eTRM. Any new measure packages for electric alternatives would follow the same review and approval process as all other measure packages.

If the answers to all three of these questions is “yes,” then that gas measure has a viable electric alternative. The first question is designed to assess if the electric alternative can fulfill the same purpose to the customer as the gas measure that it is replacing. The second question builds on the first and seeks to further ensure that the alternative is a viable electrification replacement for the gas measure. The third question’s aim is to ensure that the electric alternative will not be prohibitively expensive for the customer. CPUC staff calculated the 116 percent threshold based on the existing fuel substitution measure packages in the eTRM. We completed this calculation by comparing labor and material costs for all measure application types of existing fuel substitution measures with those same costs for the baseline gas measures. Our analysis found that a cost increase of 116 percent over the gas baseline covered all existing fuel substitution measures within 1 standard deviation of the mean; put another way, 84.1 percent of all existing measure application types for fuel substitution measures would be considered viable electric alternatives. Staff believe that an increase of 116 percent over the baseline gas measure costs represents a reasonable cost gap for customers, particularly in light of the fuel substitution potential forecast in the 2021 EE Potential and Goals Study.

There is not currently an easy and transparent way to assess the exact number of non-fuel-substitution existing measures in eTRM that qualify as viable electric alternatives. The reasons for this include that the metric for cost data can differ between gas and electrification measures, and that gas and electrification measures may not be complete equivalents. Because of this, staff recommends creating a stakeholder working group to examine existing measure packages to assess which measures are viable electric alternatives. The stakeholder working group would produce a list of recommended viable electric

⁸ The California electronic Technical Reference Manual (eTRM) is an online application that serves as the repository for all statewide deemed measures in California.

alternative measures, within a specified timeframe, that will be informed by the three questions in this section, and will be subject to review and approval by the CPUC staff in charge of deemed measures. Going forward, the deemed team would examine the best approach to ensure that new measures and measure updates contain the necessary data to easily assess whether or not a measure is a viable electric alternative.

In the future, staff would recommend adding a fourth question to the assessment of what constitutes a viable electric alternative that will assess the impact of switching from a natural gas measure to an electrification measure on customers' utility bills. While the impact of electrification on customers' bills is also important – and further discussed below – to staff's knowledge there does not currently exist a readily useable statewide tool to assess the impact of switching from gas to electric measures in different areas and climate zones. Staff recommend creating a tool to fill this gap. This topic is further discussed in Section 4.2.

3.7 Cost Effectiveness Metric

CPUC staff agree with the Sierra Club's proposal that natural gas appliance measures should be considered non-cost-effective if they score less than 1.0 on the total resource cost (TRC) test, and therefore disallowed from the EE portfolio. Using the TRC as the assessment metric allows for a clear and predictable phasing out of gas incentives, as outlined in the Retrofit and New Construction sections above. Sierra Club proposed that programs with incentives for non-cost-effective gas appliances complete their current cycle, but that no new incentives would be approved for non-cost-effective gas appliances. The TRC is the primary test used in cost effectiveness evaluations, but other options for assessing the benefits of gas incentives exist as well, including Total System Benefit (TSB). This section assesses the options for assessing the reasonableness of gas incentives for continued inclusion in the EE portfolio. Staff considered the following alternatives: TRC and TSB.

The TRC is the primary test used in EE assessments at the CPUC. It is the metric used to assess if the Resource Acquisition segment of the energy efficiency portfolios meets the CPUC's cost effectiveness requirements. Additionally, the TRC is the test used in the Potential and Goals study to assess energy efficiency potential. The Potential and Goals Study is a critical input used to determine EE goals. For these reasons, using the TRC to assess the inclusion of gas incentives is sensible.

However, further consideration is necessary to understand the impact of removing gas appliances from available measures. First, Decision 21-05-031 changed cost effectiveness requirements so that only the

Resource Acquisition segment of the portfolio is required to be cost effective (i.e., have a TRC of at least 1.0). The other segments do not have cost effectiveness requirements, so it is also important to consider if non-cost-effective gas appliances meet the requirements of the market support or equity segments.

Given the state’s focus on decarbonization of the residential building space, commercially available gas-powered appliances are unlikely to support the future of the residential energy market. These technologies are commonplace already, with most California homes still using gas powered water and space heaters. For the equity segment, gas efficiency incentives can lower customer bills in the short run. However, installing new long-lived appliances may lock low-income customers into long term gas consumption, which may burden them with poor indoor air quality and rising gas costs.

If the TRC is used as the cost effectiveness metric, consideration should be given to the appropriate threshold. Though the resource acquisition segment of the portfolio must be cost effective at a threshold of 1.0, potential and goals studies often use different thresholds, like 0.85. Regardless of the threshold chosen, a benefit of using the TRC as a threshold test is that it does not require a direct comparison to other technologies, like the electric alternative. This would facilitate a clearer and more transparent process for determining if the gas measure is permitted in the portfolio.

The other logical alternative cost effectiveness metric is the total system benefit metric. The total system benefit metric assesses the benefits a measure provides to the electrical and natural gas grids, like capacity, energy, transmission, distribution, ancillary services, and GHG reduction. Assessing the appropriateness of a measure for inclusion in the portfolio is more challenging using TSB, as using it as an approval metric would require a comparison to another metric, or a determination of minimum acceptable system benefits. At this stage, staff does not have data to support a minimum allowable TSB. Furthermore, comparing the TSB of a gas measure to an electric measure could result in cost effective gas measures being disallowed, while allowing non-cost-effective measures depending on the performance of the comparison measure. For this reason, and to ensure predictability in the incentive phase out process, staff recommends using the TRC as the assessment metric.

3.8 EE Potential and Goals Studies

As one of the CPUC’s primary tools to send policy signals to the market about the future direction of EE, the 2023 EE Potential and Goals study and future cycles will take into account any changes made to natural gas incentives in its modeling and the goals set for utilities.

4 Affordability and Cost Effectiveness

4.1 Affordability Examples Using Existing Measures

For specific examples of the cost differences between gas baseline measures and electrification measures we look at three existing fuel substitution measures: a residential ductless HVAC heat pump, a large commercial and multifamily heat pump water heater, and a residential induction cook top.

- Residential ductless HVAC heat pump (Ductless mini-split heat pump (SEER 15, HSPF 8.7), dMo, CZ01, NR)— The gas baseline measure this heat pump would replace is a standard efficiency wall furnace and window AC, which have a labor cost of \$280.60 and a materials cost of \$1,082.83 (total \$1,363.43). By comparison, normal replacement with a ductless HVAC heat pump has a labor cost of \$533.17 and a materials cost of \$1,185.23 (total \$1,718.40), making its total costs 26 percent more expensive than the gas baseline. Under staff’s proposed policy the ductless heat pump would be a viable electric alternative.
- Large commercial and multifamily heat pump water heater (Commercial heat pump water heater, ≥ 100 gal, COP = 4.2, Asm, CZ01, AR)— The gas baseline measure this heat pump water heater would replace is a 100 gallon storage natural gas water heater, which has a labor cost of \$91.81 and a materials cost of \$76.52 (total \$168.33). By comparison, accelerated replacement with a heat pump water heater with more than 100-gallon capacity has a labor cost of \$82.16 and a materials cost of \$615.03 (total \$697.19), making its total costs 314 percent more expensive than the gas baseline. Under staff’s proposed policy this heat pump water heater would not be a viable electric alternative.
- Residential induction cooktop – The gas baseline measure this cooktop would replace is a natural gas cooktop with no oven, which has a labor cost of \$135.10 and a materials cost of \$1,191.79 (total \$1,326.89). By comparison, normal replacement with an induction cooktop has a labor cost of \$135.10 and a materials cost of \$1,635.56 (total \$1,770.66), making its total costs 33 percent more expensive than the gas baseline. Under staff’s proposed policy this induction cooktop would be a viable electric alternative.

The total costs used for these measures are those used in eTRM, which are made up of labor cost and materials costs and are in normalized units. For materials costs this includes all equipment costs and non-equipment materials costs that are required to install the measure. The labor cost is the labor costs required to install the measure, usually in the form of an hourly rate and quantity of hours.⁹ These costs do not include the costs of any additional infrastructure needed for electrification, such as panel upgrades.

⁹ [White Paper: Cost Analysis Guidance for the California Statewide Deemed Energy Efficiency Measures](#). CalTF, September 4, 2020. Page 21.

4.2 Electrification Impact on Customer Utility Bill Affordability

Though installing electric appliances like heat pump water heater and HVAC equipment can have positive environmental benefits compared to gas alternatives, the impact to customer energy bills is variable. Electric rate affordability is relevant to the discussion of gas appliance incentives because they influence customer decision-making related to the viability of electric appliance alternatives. If electric and gas appliances serving comparable end-uses have comparable purchase and installation costs, but the operational costs of the electric appliance are significantly higher, then customers may not consider the electric appliance to be a viable alternative to gas. In this instance, ending incentives for high efficiency gas appliances may result in more customers choosing to install low efficiency options rather than electrify, even when offered incentives for electric appliances.

D.21-11-002 ordered the utilities to consider the bill impact to customers replacing a gas water heater with an electric heat pump water heater (HPWH). Heat pump water heaters are common fuel substitution measures, along with heat pump HVAC systems. D.21-11-002 stated that, if the utilities discovered that heat pump water heaters were likely to result in a bill increase to customers, the utilities were to propose a rate adjustment for residential customers who install heat pump water heaters in a new Rate Design Window Application.

According to PG&E, an average customer who replaces a gas water heater with a HPWH will see net bill savings with a PG&E electrification rate schedule. PG&E notes that part of the bill savings stems from heat pump water heaters operating more efficiently than most gas alternatives. California Alternative Rates for Energy (CARE) customers are likely to see larger bill savings than non-CARE customers because the electric CARE savings are higher than gas CARE savings (Advice 4571-G/6497-E).

However, SDG&E reported more variability in the bill impact of replacing a gas water heater with a heat pump water heater. The impact depended on factors such as type of customer, climate zone, and usage levels. Generally, CARE customers are expected to see decreases in their bills while non-CARE customers are expected to see a bill increase. On TOU-DR 1 rate schedule, CARE customers across various climate zones were expected to see between a \$38 and \$100 decrease in their bills. Non-CARE customers were expected to see between a \$4 decrease and a \$311 increase. Lowering the average temperature of the water tank resulted in more customer classes receiving bill savings, and lowered the highest expected annual bill increase to \$98. SDG&E proposed an electric rate schedule that would result in all classes of customers being expected to receive a bill decrease after installing a HPWH.

More information is necessary to understand the bill impact of electrification. Consideration should also be given to customer perceptions, as some customers may be concerned about high electric bills, even after rate reform takes place. These impacts could be improved or mitigated by rate reform, but that process is ongoing. Assessment of rate reform based on the utility proposals is scheduled for 2023.

4.3 Use of Phased Out Gas Incentives and Fostering of Electrification Market

Removing incentives for non-cost-effective gas appliances in the short term, with long-term goals of reducing gas incentives more globally, creates a need to consider the future of the IOU ratepayer funds collected historically for these programs. While there are many options for managing these funds, including lowering collections, one option is to redirect those funds towards exempt gas measures and programs, which reduce natural gas consumption without contributing to the installation of appliances that lock customers into a decade or more of gas utilization. Examples of such measures include windows, doors, smart thermostats, insulation, and whole building measures.

It is important to ensure that the modeling assumptions associated with these measures and programs are accurate, especially if the CPUC considers increasing funding levels. Historically, windows and doors with high energy efficiency ratings have not been included in the energy efficiency portfolio. Some factors that may contribute to these measures being excluded from the portfolio include high costs associated with replacements, lack of direct energy savings, and a lack of customer understanding regarding the role windows and doors play in reducing energy bills.

Insulation and whole building measures are included in the energy efficiency portfolio more prominently. In 2021, the CPUC conducted studies on the effective useful life (EUL) of residential insulation and whole building measures. A key finding from the residential insulation measure EUL study was that the existing EUL value of 20 years was too low, and that 32 years is a more accurate assessment of the EUL. However, the CPUC currently has a 20-year cap on the EUL of energy efficiency measures. This cap means that not all of the benefits of insulation measures are being considered during measure evaluations, which reduces the assessment of both total system benefit and cost effectiveness. As insulation is a critical component of whole building measures, the lower EUL value for insulation also impacted the whole building measure EUL, total system benefit, and cost effectiveness.

Expanding the EUL cap on long-lived measures from 20 years to at least 30 is an important consideration for this process. Non-emitting gas measures (windows, doors, insulation & whole building measures) tend to be long-lived, and the current EUL cap impacts these measures more than other types of portfolio measures. Staff recommends that the CPUC and stakeholders consider how these types of measures are currently evaluated in the portfolio and making necessary assessment changes prior to considering other options for public purpose funding that would have gone to natural gas incentives, such as decreasing collections.

(END OF ATTACHMENT 1)