BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking Concerning Energy Efficiency Rolling Portfolios, Policies, Programs, Evaluation, and Related Issues.	Rulemaking 13-11-005 (Filed November 14, 2013)

SIERRA CLUB MOTION TO PROHIBIT ENERGY EFFICIENCY FUNDING FOR NON-COST-EFFECTIVE GAS APPLIANCE INCENTIVE MEASURES

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On Behalf of Sierra Club

Dated: January 13, 2022

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Pursuant to California Public Utilities Commission ("Commission") Rule 11.1, Sierra Club hereby files this Motion to Prohibit Energy Efficiency Funding for Non-Cost-Effective Gas Appliance Incentive Measures.

I. INTRODUCTION

Each new gas appliance installed today locks in continued fossil fuel dependency, creating an additional obstacle to California achieving its decarbonization and air quality objectives. As the California Energy Commission ("CEC") observed in its most recent draft Integrated Energy Policy Report ("IEPR"), because "[w]ater heaters are expected to operate for 10-15 years and HVAC equipment for even longer…gas equipment efficiency investments have a growing likelihood over time of becoming stranded assets, a liability for carbon offsets, or cause the state to miss its goals."[1] Yet Commission energy efficiency ("EE") programs continue to incentivize deployment of gas appliances, out of step with the clear state direction to advance decarbonization. Indeed, while California has ramped up electric heat pump incentives, Southern California Gas Company ("SoCalGas") has responded in kind by drastically increasing rebate spending on gas space- and water-heating alternatives over the past three years.[2] By allowing EE funds to support these non-cost-effective gas appliance rebate programs, the Commission enables SoCalGas' weaponization of EE program funds to obstruct the state's progress toward decarbonizing its building stock. This practice need not, and should not, continue.

[1] CEC, *Draft 2021 Integrated Energy Policy Report, Volume I*, at 16 (Dec. 2021) ("2021 Draft IEPR"), https://efiling.energy.ca.gov/GetDocument.aspx?tn=240864.

[2] *See infra* at 12, Table 1 (SoCalGas spending over six times more on gas water heating rebates in 2020 compared to 2018 even as measure cost-effectiveness lowered).

While the Commission is required to identify all cost-effective natural gas efficiency savings, most gas appliance incentive measures currently offered through EE programs are not cost-effective.[3] Instead, these non-cost-effective measures are being grouped with measures that are cost-effective to achieve portfolio-level cost-effectiveness. The Commission's portfolio approach to energy efficiency is intended to enable funding of programs and measures that may not yet be individually cost-effective, but that are necessary for specific policy goals. For instance, the Commission has authorized non-cost-effective measures to facilitate innovation and promote "commercialization of promising new energy efficiency technologies" that "enable us to meet our aggressive longer-term energy efficiency goals."[4] In contrast, gas appliances such as gas furnaces and water heaters are established technologies that do not provide substantial energy and cost savings to customers and also undermine California's long-term carbon reduction and equity goals.

Accordingly, Sierra Club respectfully requests the Commission end the growing misalignment between California's appliance efficiency programs and decarbonization policies by clarifying that energy efficiency funds may not be used for non-cost-effective gas appliance incentive measures. As evidenced by utility responses to data requests, space and water heating as well as laundry equipment are the types of gas appliances for which utilities currently offer non-cost-effective incentives[5] For purposes of this motion, the Commission should consider measures to be non-cost-effective if they score less than 1.0 on the total resource ("TRC") cost test.[6]

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[3] The specific appliance measures addressed in this motion are for space heating equipment, water heaters, and laundry equipment. The gas utilities' data shows that their efficiency portfolios include non-cost-effective incentives for these appliances.

[4] Decision ("D.") 05-01-055, *Interim Opinion on the Administrative Structure for Energy Efficiency: Threshold Issues*, at 135 (Jan. 27, 2005), https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/43628.PDF; *see also* D.05-04-051, *Interim Opinion: Updated Policy Rules for Post-2005 Energy Efficiency and Threshold Issues Related to Evaluation, Measurement, and Verification of Energy Efficiency Programs*, at 43 (Apr. 21, 2005), https://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/45783.PDF.

[5] Gas appliance incentive measures are rebates for purchasing and/or installing gas appliances, measures that cover the direct labor and/or materials installation costs of gas appliances, and any other incentives that offset the costs of purchasing and/or installing gas appliances.

[6] The TRC test measures the net costs of a demand-side management program as a resource option based on the total costs of the program, including both the participants' and the utility's costs. CPUC, *California Standard Practice Manual: Economic Analysis of Demand-Side Programs and Projects*, at 18 (Oct. 2001), https://www.cpuc.ca.gov/-/media/cpuc-

To implement the prohibition on EE funding for non-cost-effective gas appliance measures, existing programs that are already approved should be allowed to complete their current cycle, but should be ineligible for continuation thereafter without a showing of measure-level cost-effectiveness. In addition, no new programs authorizing non-cost-effective gas appliance measures should be approved while the Commission resolves this motion. To ensure utilities have the opportunity to meet all approved Commission savings goals, the Commission should allow utilities to shift funds from previously planned non-cost-effective gas appliance incentive measures to other activities and can evaluate whether savings goals may need to be adjusted.

II. PROCEDURAL BACKGROUND

This proceeding is the proper venue for parties to ask the Commission to update its energy efficiency policy to prevent utilities from spending ratepayer funds on non-cost-effective measures that undermine state policy. In D.18-05-041, the Commission approved energy efficiency business plans, sector strategies, and associated approved budgets for activities running between 2018 and 2025.[7] In that decision, the Commission directed parties that believe "a specific cost-effectiveness policy warrants modification" to "file a motion with cites to specific evaluation studies and/or program data supporting their proposal in R.13-11-005 or its successor proceeding."[8] In the most recent scoping memo for this proceeding, Commissioner Shiroma and Administrative Law Judges Fitch and Kao confirmed that this proceeding "may consider whether and how to modify energy efficiency policy to better align with broader decarbonization objectives," as part of the Commission's continued movement "towards greater decarbonization of buildings and the economy."[9]

III. DISCUSSION

A. State Subsidies for New Gas Appliances Are Inconsistent with California's Climate and Public Health Objectives.

California agencies have repeatedly found that widespread electrification of gas

website/files/uploadedfiles/cpuc_public_website/content/utilities_and_industries/energy_-_electricity_and_natural_gas/cpuc-standard-practice-manual.pdf.

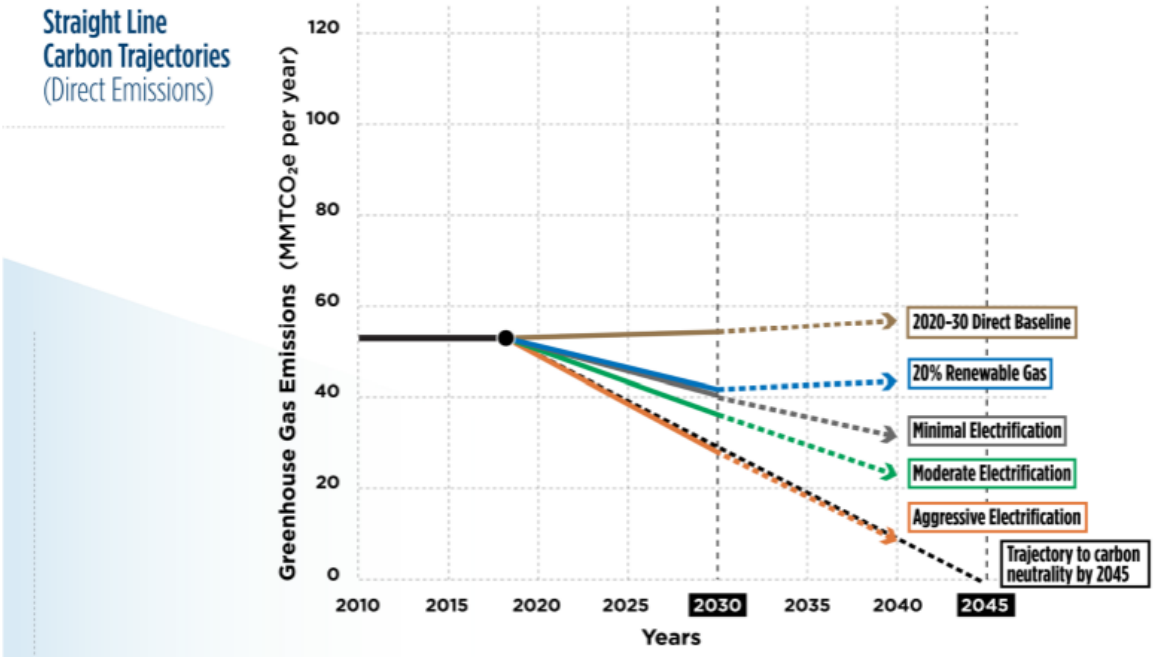
[7] D.18-05-041, *Decision Addressing Energy Efficiency Business Plans*, at 2 (May 31, 2018), https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M215/K706/215706139.PDF.

[8] *Id.* at 75.

[9] R.13-11-005, *Assigned Commissioner and Administrative Law Judges' Amended Scoping Ruling*, at 4 (Dec. 23, 2021), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M434/K617/434617504.PDF.

appliances is necessary to achieve the state's climate and public health objectives. Last year, the California Air Resources Board ("CARB") adopted Resolution 20-32, which determined that "100 percent electrification of natural gas appliances in California would result in significant health benefits and reduction of greenhouse gas (GHG) emissions from natural gas combustion in residential buildings."[10] In its Building Decarbonization Assessment, the CEC found that "aggressive electrification," which assumes 100 percent electrification in new construction, 90 percent replacement on burnout and 70 percent early retirement, is necessary to reduce the direct emissions from buildings in line with California's 2045 carbon-neutrality goal.[11] Under a moderate scenario, half of all gas appliances would be replaced by electric alternatives.[12]

Figure ES-7: Direct Straight-Line Building Emission Trajectories of Scenarios Compared to 2045 Carbon Neutrality



Key conclusions from the Building Decarbonization Assessment were that "[r]educing direct emissions – which are largely due to onsite use of fossil gas – will require large-scale deployment of electric heat pumps" and that *"[t]he CPUC may wish to review the role incentives*

[10] CARB, Res. 20-32 at 2–3 (Nov. 19, 2020), https://ww3.arb.ca.gov/board/res/2020/res20-32.pdf.
[11] CEC, *Final Commission Report: California Building Decarbonization Assessment*, at 14–15, 45–46 (Aug. 13, 2021) ("AB 3232 Report") https://www.energy.ca.gov/publications/2021/california-building-decarbonization-assessment.
[12] *Id.* at 45.

play in adding new gas infrastructure for buildings."[13] While "[h]ighly efficient electric appliances are essential to building decarbonization…gas efficiency investments may be left unrecouped by new electrification investments."[14] Indeed, "[t]he overall cost of investing in upgrading the efficiency of a gas appliance to achieve 2030 goals, and then later upgrading that gas appliance to a high-efficiency electric one later, is greater than the cost of upgrading to a high-efficiency electric appliance in the first place."[15]

The CEC has reaffirmed the conclusions of the Building Decarbonization Assessment in the 2021 Draft IEPR, further cautioning against new gas appliances. With regard to gas EE investments, the 2021 Draft IEPR properly observes that while "improvements to building insulation, duct work, and sealing" will maintain their value as the state progresses toward its decarbonization goals, installation of new gas appliances "have a growing likelihood over time of becoming stranded assets, a liability for carbon offsets, or cause the state to miss its goals." [16] Similarly, the Commission's staff proposal in the Building Decarbonization proceeding identified gas line extension allowances as a "barriers to building decarbonization and, by extension, [an obstacle] to GHG reductions in California's building sector" and has recommended that the Commission eliminate these allowances to facilitate the ongoing transition to all-electric construction.[17] Staff noted that "California must accelerate its efforts to reduce gas usage in homes and offices if it is to succeed in meeting its ambitious climate goals," and urged the Commission to "use its broad regulatory authority to act decisively in support of building decarbonization."[18] At CARB, staff recently proposed a statewide zero GHG emission standard for residential and commercial space and water heating starting in 2030.[19] California's climate policy is clear, and incentivizing new gas appliance installations is not aligned with it.

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[13] *Id.* at 15 (emphasis added).
[14] *Id.* at 19.
[15] *Id.* at 35.
[16] 2021 Draft IEPR at 15–16.
[17] R.19-01-011, *Assigned Commissioner's Amended Scoping Memo and Ruling, Appendix A: R.19-01-011 Phase III Staff Proposal*, at 17 (Nov. 16, 2021), https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M423/K516/423516230.PDF.
[18] *Id.* at 46.
[19] CARB, *2022 State Strategy for the State Implementation Plan: Draft Measures*, at 54–55 (Oct. 26, 2021), https://ww2.arb.ca.gov/sites/default/files/2021-10/2022_SSS_Draft_Measures.pdf.

B. Requiring Gas Appliance Measures to Be Cost-Effective on a Measure Level Basis is Consistent with Commission EE Law and Policy.

The Commission has no obligation to provide EE funding for non-cost-effective gas appliance measures or programs. Public Utilities Code § 454.56 only requires the Commission to "identify all potentially achievable *cost-effective* natural gas efficiency savings and establish efficiency targets" for gas utilities.[20] The Commission can meet this statutory requirement for gas utilities while rejecting the inclusion non-cost-effective measures that would result in installation of new gas appliances and instead focus on therms savings from fuel-switching to efficient electric appliances and from building envelope or ducting improvements. The Commission also recently expressed its "intent for the program administrators to aggressively pursue all potentially achievable cost-effective energy savings opportunities, particularly from fuel substitution measures that have thus far gone untapped, including [heat pump water heating]."[21] These fuel-switching or appliance-neutral building upgrades are better pathways for gas utilities to reach the Commission's identified gas efficiency targets, and are more likely to be cost-effective, particularly in the long-term.[22]

While the Commission employs a portfolio-level assessment to its cost-effectiveness review, the basis for this approach is to allow for innovative programs that can transform the market to include high-efficiency technology that advances the state's long-term energy or equity goals.[23] Where a program is not cost-effective and does not align with the state's policy, the Commission is not obligated to approve it simply because it has been included in a portfolio that is cost-effective on an overall basis. As an example, when it first established the portfolio approach, the Commission required that solar water heating installations be "cost-effective on a

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[20] Cal. Pub. Util. Code § 454.56 (emphasis added). *See also* D.15-10-028, *Decision Re Energy Efficiency Goals for 2016 and Beyond and Energy Efficiency Rolling Portfolio Mechanics*, at 121, Conclusion of Law No. 1 (Oct. 22, 2015) (citing Cal. Pub. Util. Code § 454.55–454.56) https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M155/K511/155511942.pdf; CPUC, *Energy Efficiency Policy Manual Version 6*, at 9 (Apr. 2020) (citing Pub. Util. Code § 454.5(b)(9)(C) for the requirement that IOUs first meet their "unmet energy resource needs through all available energy efficiency and demand reduction resources that are cost effective, reliable, and feasible.") https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/e/6442465683-eepolicymanualrevised-march-20-2020-b.pdf.

[21] D.21-09-037, *Decision Adopting Energy Efficiency Goals for 2022–2032*, at 16 (Sept. 23, 2021) https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M411/K177/411177185.PDF.

[22] *See* International Energy Agency, *Is Cooling the Future of Heating?*, (Dec. 13, 2020), https://www.iea.org/commentaries/is-cooling-the-future-of-heating.

[23] *See* D.05-04-051 at 53–54.

stand-alone basis to be eligible for funding."[24] Specifically, the Commission stated that "energy efficiency funding should not be used to encourage the deployment of non-cost-effective solar water heating technologies (i.e., by bundling them with cost-effective energy efficiency measures)."[25] The Commission can reach a similar determination here and require a demonstration that measures to incentivize gas appliance adoption are cost-effective on a stand-alone basis before allocating any EE funding to them.

In contrast, allocation to innovative electrification measures that may not be currently cost-effective is justified under the portfolio approach. As noted by the CEC, "[s]pecific to electrification, some technologies available today have premium prices due to the associated smaller market share. Thus, market transformation activities that can lower technology prices are critical."[26] Heat pumps and other emerging technologies are precisely the type of technology that the Commission contemplated in its decisions establishing the portfolio approach—not lower-efficiency, mature fossil-fueled technologies whose adoption slows the state's progress toward carbon neutrality, whose installation presents health and safety hazards to its users, and whose installation strands assets with remaining gas customers.

The Commission has long relied on portfolio-level cost-effectiveness evaluations to encourage innovation, but non-cost-effective gas appliance incentives do not promote this goal. In D.94-10-059, the Commission recognized that "under a portfolio approach, the utility is more likely to pursue creative changes to programs or pursue new programs that have the potential for increasing net benefits."[27] The Commission adopted this policy to encourage utilities to

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[24] *Id.* at 30.
[25] *Id.*
[26] AB 3232 Report at 82. The importance of EE policy to support market transformation is not a new concept at California's agencies. The Commission itself has stressed market transformation in support of long-term goals for over a decade in its EE policy documents. *See* CPUC, *Energy Efficiency Strategic Plan: January 2011 Update*, at 4–5 (Jan. 2011) ("This plan seeks to move utilities, the CPUC, and other stakeholders beyond a focus on short-term energy efficiency activities into a more sustained long-term, market transformation strategic focus . . . Transformation is an evolutionary process, as markets for a given end-use are not transformed just once, but continuously. Understanding when a technology promoted in utility programs has become established within the mainstream market or incorporated into codes and standards will help target when new programs are needed to encourage the next generation of energy efficiency technologies.") https://www.cpuc.ca.gov/-/media/cpuc-website/files/legacyfiles/c/5303-caenergyefficiencystrategicplan-jan2011.pdf. The 2011 update to the Energy Efficiency Strategic Plan also detailed the Commission's "Big Bold Energy Efficiency Strategies," including all new residential construction in California being zero net energy by 2020. *Id.* at 6.
[27] D.94-10-059, *Interim Opinion on DSM Shareholder Incentives: Implementation Phase*, at 72 (Oct. 28,

diversify their programs, rather than sticking solely to "tried and true" programs.[28] Thus, the Commission approves programs that might not be cost-effective on their own to give the utilities space to innovate and lay the groundwork for programs that could be cost-effective either initially or in future iterations. This rationale does not apply to funding non-cost-effective gas appliance incentives. Appliance rebate and installation programs for mature gas technologies are the epitome of a "tried and true" approach. Granting this motion would allow utilities to continue these programs with measures that are cost-effective, benefiting from the utilities' decades of experience with this type of program.

The Commission should end non-cost-effective gas appliance incentives because these measures also threaten the market transformation that is necessary to unlock the next generation of efficient technologies. For instance, SoCalGas offers an array of incentives for gas water heaters that are not cost-effective measures.[29] These incentives encourage customers to achieve marginal energy savings by installing mature gas appliances with efficiencies as low as 0.81 rather than an electric heat pump water heater with an efficiency of more than 3.45.[30] Ending non-cost-effective gas appliance measures will promote market transformation of these ultra-efficient appliances, instead of enabling gas incentives to be offered that compete with and undermine innovative programs and lock customers into increasingly obsolete gas appliances.

Similarly, in D.05-04-051, the Commission explained that calculating cost-effectiveness on a portfolio-level provides the opportunity to develop programs for new, less-understood technologies:

This provides the IOUs with needed flexibility to consider new designs and

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1994) (also reasoning that (1) the portfolio-level approach allows utilities the flexibility to shift money between programs and maximize the cost-effective energy efficiency that would be recognized in a post-hoc evaluation; and (2) that the portfolio approach advances the Commission's least-cost procurement objectives), https://www.sdge.com/sites/default/files/D94_10_059_1_0.pdf.

[28] *Id.*

[29] Attach. A to this motion includes SoCalGas' data request response Sierra Club/NRDC-SCG-01-A and the Data Dictionary and Pivot tabs of the Excel file SoCalGas attached to its response, Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx. Sierra Club is also including courtesy copies of all Excel files the utilities produced with the discovery cited in with its service emails for this motion.

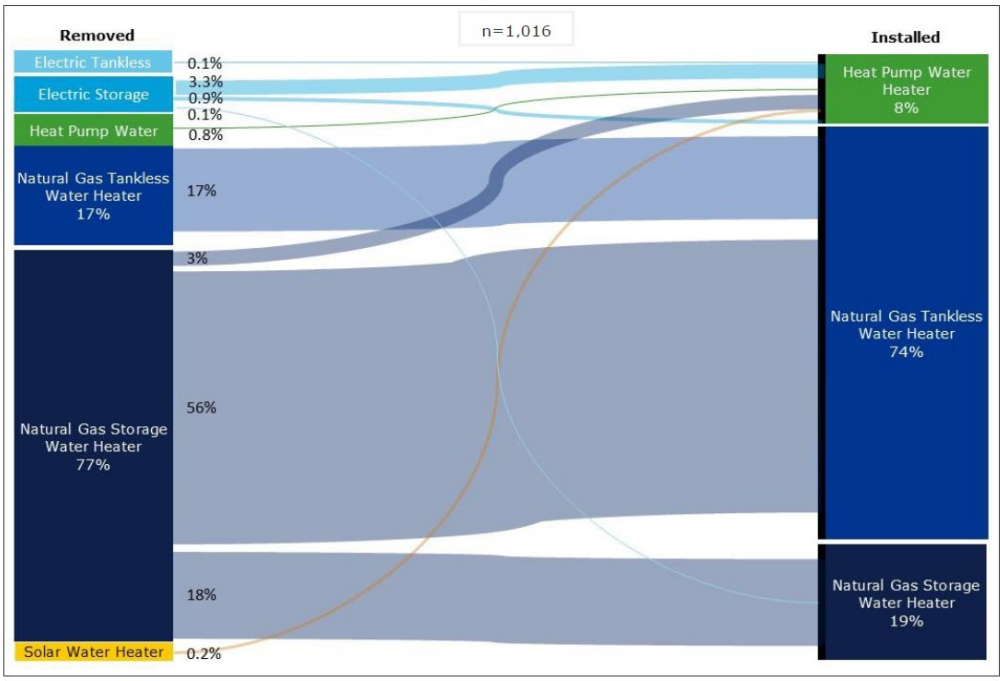
[30] For instance, eligible heat pump water heaters in the Commission-authorized TECH program have energy efficiency ratings between 3.45 and 4. TECH Clean California, *Incentives* https://energy-solution.com/tech-incentives/ (providing the qualifying products list for single-family customers for download). The Data_Response tab of the spreadsheet SoCalGas produced in discovery includes non-cost-effective measures for residential customers with the description "Small Tankless Water Heater, Tier 1 (UEF>=0.81), Medium Draw."

> technologies (whose savings may be less certain) along with standard programs in assembling a portfolio that will achieve or exceed the Commission's savings goals. We have also adopted policy rules to address emerging technologies, in order to encourage innovation from promising new technologies over the longer-term.[31]

Thus, the Commission has properly modified its cost-effectiveness requirements to allow utilities to invest ratepayer funds in promising emerging technologies with the potential to deliver cost-effective long-term energy savings. It would be inappropriate to continue non-cost-effective gas appliances measures in "standard programs" that offset the costs of technologies that are already established in the market, when achieving California's climate goals will require a widespread transition from gas appliances to newer efficient electric heat pump technologies.

The market for water heaters for single-family residences illustrates the folly of funding non-cost-effective incentives for gas appliances. Tankless water heaters—the most efficient kind of gas water heating equipment—are already dominant in California's owner-occupied homes, as shown in the following figure:[32]

Figure 4-1. Water heater replacements for occupant decision-makers



[31] D.05-04-051 at 54.

[32] CPUC, *Impact Evaluation of Water Heating Measures - Residential Sector - Program Year 2019*, at 22 (June 16, 2021) http://www.calmac.org/publications/CPUC_Group_A_Report_Water_Heating_PY_2019_Final_CALMAC.pdf.

The Commission's most recent evaluation of residential water heating programs explains that these long-lived appliances represent a lost opportunity to transition to more efficient electric heat pumps: "Notably, tankless water heaters have a 20-year expected useful life versus the 11 years for storage water heaters. If participants continue to install tankless water heaters and remove storage water heaters, the average effective useful life of water heaters in California will increase. As a result, opportunities for fuel substitution may be delayed as there will be fewer equipment failures annually."[33] Ultimately, incentives for gas water heaters and other gas appliances do not just lack the hallmarks of the new and innovative programs that the Commission has modified its cost-effectiveness requirements to accommodate—these programs threaten to crowd out the cutting-edge efficient electric technologies that California needs to meet its climate and equity goals.

C. The Investor-Owned Utilities' Gas Appliance EE Measures are not Cost-Effective.

Current programs that offer installations of gas appliances are not cost-effective, and are not appropriate investments to achieve the state's longer-term goals even if they provide some incremental therms savings over the older, less efficient gas appliances they would replace. Even if a gas appliance installation measure appeared to be cost-effective under modeling circumstances, it cannot be qualitatively assessed as a good investment in the context of California's policy trajectory.

Further, many gas appliance incentive measures are not cost-effective, based on recent program data. For instance, SoCalGas produced data on its 2018, 2019, and 2020 incentives for new gas-powered appliances in discovery, which shows that the great preponderance of these measures are not cost-effective. SoCalGas' gas appliance incentive measures offset the costs of four categories of equipment: residential water heating; residential space heating; non-residential water heating; and non-residential space heating.[34] SoCalGas produced a spreadsheet with the

[33] *Id.* at 8.

[34] Attach. A (Response to Sierra Club/NRDC-SCG-01-A Data Request (Nov. 16, 2021)). SoCalGas provided data for residential water heating and space heating in response to question 1.a.i–ii and stated that there were "none reported" in response to question 1.a.iii's request for information about incentives for "[a]ll other new gas technologies for residential customers" other than water heating and space heating. Similarly, SoCalGas provided data for non-residential water heating and space heating in response question 1.a.iv–v and stated that there were "none reported" in response to question 1.a.vii's request for information about incentives for other non-residential gas appliances.

TRC ratios of 17,723 specific gas appliance incentive measures that its efficiency programs funded in 2018, 2019, and 2020.[35] According to SoCalGas' own data, 16,785 measures (i.e., 94.7% of the measures with TRC data) have a TRC ratio less than 1.0.[36] The vast majority of measures do not even come close to achieving cost-effectiveness; 16,612 measures (i.e., 93.7% of the measures with TRC data) have a TRC ratio of less than 0.85.[37] This is a remarkable failure to achieve cost-effectiveness in traditional resource acquisition programs because these kinds of programs are well-understood and capable of delivering cost-effective savings. The Commission recently observed that resource acquisition programs have the "primary purpose of, and a short-term ability to, deliver cost-effective avoided cost benefits to the electricity and natural gas systems."[38]

In aggregate, these measures represent a significant investment in measures that are not cost-effective. The sum of TRC_Cost values is $23,500,688.80.[39] Meanwhile, the sum of all the measures' benefits is $9,802,229.85.[40] Thus, taken as a whole, the TRC ratio of SoCalGas' gas appliance incentive measures is slightly less than 0.42.[41] Moreover, SoCalGas' appliance incentive measures are not cost-effective when evaluated using the Program Administrator Cost ("PAC") test. The aggregate PAC ratio for these measures is 0.81.

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[35] Sierra Club is attaching a courtesy copy of this file, Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx, within Attach. A of this motion to provide all parties access to the raw data it received from SoCalGas. Sierra Club tabulated the number of non-cost-effective measures by sorting all measures listed in the "Data_Response" tab by the TRC_Ratio column. Note that the spreadsheet includes some information on a total of 17,758 measures, but only includes TRC_Cost and TRC_Ratio data for 17,723 of these. Of the 35 measures that lack TRC_Cost data, 32 measures have benefits data and ***all*** 32 of these building design incentives and downstream custom incentives have ***negative*** benefits, which means that they could not have a positive TRC ratio even if SoCalGas implemented them at zero cost.

[36] *Id.*

[37] *Id.*

[38] D.21-05-031, *Assessment of Energy Efficiency Potential and Goals and Modification of Portfolio Approval and Oversight Process*, at 14 (May 20, 2021) ("D.21-05-031"), https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M385/K864/385864616.PDF.

[39] Sierra Club used the AutoSum function to calculate the sum of the Benefits and TRC_Cost columns in the "Data_Response" tab of the Excel file, Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx, it received from SoCalGas.

[40] *Id*.

[41] Note that SoCalGas' Pivot tab lists a TRC_Rollup of 1.11 as "Grand Total," which it derived by adding together the weighted average TRC ratios for its appliance incentive measures for the commercial sector (0.74) and residential sector (0.37). This spreadsheet entry is misleading because a reviewer without access to the embedded formula would likely assume that 1.11 is the weighted average TRC ratio for all the appliance measures SoCalGas provided data on. In reality, the weighted average of these measures is 0.417.

SoCalGas' non-cost-effective appliance measures span its residential and non-residential offerings and both its water heating and space heating efforts. Tables 1 and 2 list the incentives provided through various types of SoCalGas appliance programs in recent years and the cost-effectiveness of each category of program for residential and non-residential customers, respectively:

Table 1: Residential SoCalGas Gas Appliance Incentives and Utility Costs[42]

Program/Appliance Type	**Year**	**Utility Costs[43]**	**Incentives[44]**	**TRC Ratio**
Space Heating				
	2018	$61,199.95	$56,950.00	0.82
	2019	$227,582.08	$163,700.00	0.81
	2020	$297,760.00	$223,925.00	0.60
Water Heating				
	2018	$648,932.61	$577,350.00	0.43
	2019	$2,874,871.91	$2,233,825.00	0.30
	2020	$4,760,612.94	$3,669,725.00	0.29
WBldgImpArea (includes both space and water heating measures)				
	2018	$393,634.78	$156,267.44	1.16
	2019	$192,720.20	$5,228.98	0.72
	2020	$167,570.71	$139,253.15	0.96

[42] All data in this table is pulled directly from the "Pivot" tab of the spreadsheet SoCalGas produced in discovery, which is included in Attach. A.

[43] SoCalGas includes these costs in the "Sum of PAC_Cost" column and its Data Dictionary defines PAC_COST as "CEDARS PAC Cost Total." PACs include both incentives and any other program and measure related spending, such as money spent on marketing, internal administrative work, and payments to consultants.

[44] SoCalGas' Data Dictionary defines Incentive as "Total Incentives Paid - Sum of CEDARS fields for End User Rebate, Incentive to Others, Direct Install Labor, and Direct Install Materials."

Table 2: Non-Residential SoCalGas Gas Appliance Incentives and Utility Costs[45]

Program/Appliance Type	Year	Utility Costs	Incentives	TRC Ratio
Space Heating				
	2018	$760,305.88	$182,390.00	1.13
	2019	$166,329.09	$22,013.20	0.55
	2020	$282,463.37	$2,202.00	0.04
Water Heating				
	2020	$61,187.57	$477.00	0.04
WBldgImpArea (includes both space and water heating measures)				
	2018	$107,156.19	$22,022.24	1.07
	2019	$1,110,097.48	$149,054.54	0.62

As these tables show, the failure of SoCalGas' appliance measures to achieve cost-effectiveness is a pervasive problem that affects both residential and non-residential customers and multiple kinds of appliances.

The poor performance of SoCalGas' appliance incentives on the TRC is not an outlier. California's other major gas utilities have also incentivized the installation of thousands of gas appliances in recent years through non-cost-effective measures. Table 3 summarizes the data San Diego Gas & Electric ("SDG&E") provided on all of its residential gas appliance incentives. Not a single one of SDG&E's residential gas appliance incentive programs is cost-effective. Note that this motion's summary tables are in a slightly different format for each utility because the utilities produced data in discovery in different formats:

Table 3: SDG&E Residential Gas Appliance Incentives and Total Resource Costs[46]

Name of Program	Year	Appliance Type	Number of Units	Total Resource Cost	Incentives	TRC Ratio

[45] All data in this table is pulled directly from the "Pivot" tab of the spreadsheet SoCalGas produced in discovery, which is included in Attach. A.

[46] All data in this table is pulled directly from the Excel spreadsheet SDG&E produced in discovery, which is attached to this motion as Attach. B, except for the TOTALs, which Sierra Club tabulated by simple addition.

3P-Res-Comprehensive Manufactured-Mobile Home	2018	Space Heating – 96% AFUE Furnace	485	$3,292	$1,040	0.35
RES Upstream HVAC Incentive Program	2018	Space Heating – 96% AFUE Furnace	2,560	$69,077	$8,855	0.13
3P-Res-Comprehensive Manufactured-Mobile Home	2018	Water Heating – at least .87 UEF Tankless	5	$6,538	$1,582	0.31
SW-CALS-Plug Load and Appliances-HEER	2018	Water Heating - .64 UEF Storage	67	$34,392	$6,700	0.27
SW-CALS-Plug Load and Appliances-POS Rebates	2018	Water Heating - .64 UEF Storage	1,107	$244,242	$178,796	0.64
HOPPs - Multi Family	2018	Water Heating – 90% Thermal Efficiency Boiler	27,661	$1,368,574	$1,217,914	0.57
SW-CALS-Plug Load and Appliances-POS Rebates	2018	Water Heating - .64 UEF Storage	4	$943	$823	0.54
RES Upstream HVAC Incentive Program	2019	Space Heating – 96% AFUE Furnace	4,893	$180,593	$22,812	0.09
SW-CALS-Plug Load and Appliances-HEER	2019	Water Heating - .68 UEF Storage	78	$45,914	$7,800	0.23
SW-CALS-Plug Load and Appliances-POS Rebates	2019	Water Heating - .68 UEF Storage	1,237	$414,836	$229,489	0.46
SW-CALS-Plug Load and Appliances-POS Rebates	2020	Water Heating - .68 UEF Storage	1,250	$397,244	$138,750	0.54
TOTAL			**39,347**	**$2,765,645**	**$1,814,560**	

Not only do these programs funnel ratepayer funds to non-cost-effective measures, but they spend ratepayer funds on measures that marginally improve water heater efficiency, such as water heaters with efficiencies of 0.64 or 0.68. It is no surprise that these measures are not cost-effective: the incremental efficiency gains are minimal and do not justify ratepayer investment.

The efficiency of these gas appliances is less than one-fifth the efficiency of an electric heat pump water heater,[47] further illustrating the importance of shifting investments away from non-cost-effective marginally efficient gas technologies to innovate efficient electric options. Note that this issue also arises in SDG&E's commercial offerings, which include a mix of cost-effective and non-cost-effective measures.[48]

Similarly, the average cost-effectiveness is far below 1.0 on the TRC for all categories of Pacific Gas & Electric Company's ("PG&E") residential gas appliance incentives. PG&E produced data for its residential gas appliance incentives in 2018 in three categories: water heating, space heating, and "other," which includes incentives for laundry equipment. Table 4 summarizes the key data on these incentives:

Table 4: PG&E Residential Gas Appliance Incentives and Utility Costs [49]

Appliance Type	**Utility Costs**	**Incentives**	**TRC Ratio**
Water Heating	$85,993	$60,375	0.56
Space Heating	$93,151	$25,366	0.45
Other (laundry equipment)	$445,562	$356,250	0.26
TOTAL	$624,706	$441,991	

Each of these categories of residential appliance incentives also fail the PAC test.[50] PG&E's non-residential gas appliance incentives also include some non-cost-effective measures.[51] Taken together, all three of California's major gas utilities are using ratepayer funds to incentivize the deployment of gas appliances through energy efficiency measures that are not cost-effective.

The alarmingly low TRC scores for the gas utilities' recent appliance incentives are precisely the type of program-specific data that the Commission has stated would enable

[47] As discussed above, the lowest-efficiency electric heat pump water heater that qualifies for a rebate in TECH's single-family program is 3.45 UEF, which is more than five times the efficiency of a gas storage heater with an efficiency of 0.68 UEF.
[48] In 2018, SDGE's non-residential space heating gas boiler measures had a TRC ratio of 0.51 and its gas water heating program for non-residential pools had a TRC ratio of 0.36. *See* Attach. B.
[49] All data in this table is pulled directly from the "Pivot Table" tab of the spreadsheet PG&E produced in discovery, which is included in Attach. C, except for the TOTALs that Sierra Club tabulated by simple addition. Note that PG&E only provided data for 2018 for these categories of incentives.
[50] PG&E's pivot table lists PAC ratios of 0.88, 0.57, and 0.64 for its residential gas water heating, space heating and "other" programs, respectively.
[51] *Id.* For instance, the TRC ratio for PG&E's gas space heating appliance measures in 2018 was 0.47.

improvements to its cost-effectiveness policies. In approving most recent energy efficiency business plans, the Commission acknowledged that modifications to cost-effectiveness policies "may prove to have merit," but that parties would need to justify their positions with program data and present the concrete data in a motion in this proceeding.[52] The data presented in this motion are the benefits and costs of measures that the utilities actually funded through efficiency programs in 2018, 2019, and 2020.[53] Moreover, this data is reliable because it is based on resource acquisition programs, which the Commission has identified as the "most straightforward" kinds of programs to assess for cost-effectiveness: "The costs and energy system benefits of the resource acquisition programs should be readily identifiable using existing tools."[54] Therefore, the Commission now has the information it needs to avoid additional authorizations of non-cost-effective measures that will lock in years of emissions from gas appliances.

IV. CONCLUSION

For the reasons set forth above, Sierra Club respectfully requests that the Commission no longer approve non-cost-effective EE measures that result in the installation of gas-fueled appliances. The Commission is empowered and entrusted to advance the state's policy goals through its governance of utilities' EE portfolios. Ratepayer funds for EE programs should no longer be allocated to measures that run counter to the state's climate and energy objectives and present hazards to human health. Accordingly, the Commission should not authorize any additional gas appliance incentive measures in energy efficiency programs that fail to meet a cost-effectiveness threshold of 1.0 in the TRC.

To implement the prohibition on EE funding for non-cost-effective gas appliance measures, existing programs that are already under contract should be allowed to complete their current cycle, but should be ineligible for continuation thereafter without a showing of measure-level cost-effectiveness. In addition, no new programs authorizing non-cost-effective gas appliance measures should be approved while the Commission resolves this motion. To ensure utilities have the opportunity to meet all approved Commission savings goals, the Commission

[52] D.18-05-041 at 75.
[53] Attachs. A–C (requesting and receiving such data from SoCalGas, PG&E and SDG&E). The "Data Dictionary" tabs of the Excel files SoCalGas and PG&E produced explain that the Benefits provided are the CEDARS Benefits Total and the TRC_Cost provided are the CEDARS TRC Cost Total.
[54] D.21-05-031 at 21.

should allow utilities to shift funds from previously planned non-cost-effective gas appliance incentive measures to other activities and can consider whether existing goals need to be revisited.

Dated: January 13, 2022.

Respectfully submitted,

/s/ *Sara Gersen*
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On Behalf of Sierra Club

Docket No: R.13-11-005

Sierra Club

Attachment A

SoCalGas' Response to
Sierra Club/NRDC-SCG-01-A Data Request

SOUTHERN CALIFORNIA GAS COMPANY

SIERRA CLUB/NRDC-SCG-01-A DATA REQUEST
RECEIVED: NOVEMBER 7, 2021
SUBMITTED: NOVEMBER 16, 2021

QUESTION 1:

For 2018, 2019, and 2020, please provide the following information:

a. The total dollar amount spent under SoCalGas efficiency programs on incentives (upstream, midstream and downstream) for new gas-powered technologies for each of the following
    i. Residential water heating. Where data is available, please separate between incentives to single and multi-family homes.
    ii. Residential single-family space heating. Where data is available, please separate between incentives to single and multi-family homes.
    iii. All other new gas technologies for residential customers not included in *i and ii* above
    iv. Non-residential water heating
    v. Non-residential space heating in each category
        1. Gas boiler
        2. Rooftop unit
        3. Other
    vi. Non-residential pool heating
    vii. Other non-residential gas appliances
b. For each of the appliance categories identified above, the program name incentivizing the appliance, the average cost effectiveness, and the total quantity of appliances incentivized.

SCG RESPONSE

SoCalGas objects to the undefined term "new gas-powered technologies" as vague and ambiguous. SoCalGas further objects to the use of the term "other" is subparts iii, v.3, and vii. of this question as vague and ambiguous. In responding to this request, SoCalGas data queried measures from the "Residential New Construction (CAHP)," "Energy Efficient New Homes," and "Savings by Design" programs.

SoCalGas also objects to subpart b.'s request for "average cost effectiveness" for each appliance category identified to the extent the request imposes upon SoCalGas an obligation to generate or create records or data which do not exist, and which have not been generated or created in its regular course of business, which requirement exceeds the requirements provided by the CPUC's Discovery Custom and Practice Guidelines and the California Code of Civil Procedure Section 2031.230 (proper response stating inability to comply with discovery requested includes a statement that "the particular item or category [of records] has never existed."). *See also* A.05-04-020, *In the Matter of the Joint Application of Verizon Communications Inc. and MCI, Inc.*, Administrative Law Judge's Ruling Addressing Motion of Qwest to Compel Responses, Aug. 5, 2005,

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at p. 7 (regarding motion to compel, emphasizing that "Verizon is not required to create new documents responsive to the data request") (also available at 2005 WL 1866062); A.05-02-027, *In the Matter of the Joint Application of SBC Communications Inc. and AT&T Corp.*, Administrative Law Judge's Ruling Regarding ORA's Second Motion to Compel, June 8, 2005, at p.23 (on motion to compel, stressing that SBC Communications "shall not be required to produce new studies specifically in response to this DR") (also available at 2005 WL 1660395). Subject to and without waiving these objections, SoCalGas responds as follows:

With regard to the request for "average cost effectiveness", after the submittal of SoCalGas's original response, Sierra Club/NRDC provided SoCalGas with the template and data provided to them by Pacific Gas and Electric Company and requested that SoCalGas provide similar information. SoCalGas has revised its response to include the dollar values of the Total Resource Cost benefits and costs and the TRC ratio.

a.

i. Please see file Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx –
   1. Year – Column M
   2. Delivery Type – Column P
   3. Incentive – Column W
   4. Category – Column J (Water Heating)
   5. SF/MF – Column L

ii. Please see file Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx –
   1. Year – Column M
   2. Delivery Type – Column P
   3. Incentive – Column W
   4. Category – Column J (Space Heating)
   5. SF/MF – Column L

iii. None reported.

iv. Please see file Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx –
   1. Year – Column M
   2. Delivery Type – Column P
   3. Incentive – Column W
   4. Category – Column C (Water Heating)

v. Please see Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx –
   1. Year – Column M
   2. Delivery Type – Column P
   3. Incentive – Column W
   4. Category – Column C (Space Heating)
      a. Gas boiler – N/A
      b. Rooftop unit – N/A
      c. Other – N/A

vi. None reported.
vii. None reported.

b. SoCalGas does not keep track of or report measure-level average cost effectiveness.

Program name:
Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx – Column O

Total Quantity (where available):
Sierra Club-NRDC-SCG-01-A Residential_Non-Residential.xlsx – Column R

Field Name	Description
FUEL_TYPE	Fuel Source Type: Gas, Electric, Mixed, or Zero Considered 'Gas' if Therms savings are > 0 and kWh savings are <= 0 Considered 'Electric' if kWh savings are > 0 and Therms savings are <= 0 Considered 'Mixed' if both kWh and Therms savings are > 0 Considered 'Zero' if no savings were recorded for a claim.
Primary_Sector	'Residential' if CEDARS Primary Sector is Residential, otherwise 'Non-Residential'
Category	Claims categorized into Types according to data request
MEASURE_CODE	CEDARS Measure Code for these claims
MEASURE_DESCRIPTION	CEDARS Measure Description for these claims
MEASURE_TECHNOLOGY_ID	CEDARS Measure Technology ID
TECHNOLOGY_GROUP	CEDARS Technology Group
TECHNOLOGY_TYPE	CEDARS Technology Type
USE_CATEGORY	CEDARS Use Category
USE_SUBCATEGORY	CEDARS Use Sub-Category
PREEXISTING_TECHNOLOGY_DESCRIPTION	CEDARS Pre-Existing Technology Description
STANDARD_TECHNOLOGY_DESCRIPTION	CEDARS Standard Technology Description
BUILDING_TYPE	CEDARS Building Type
YEAR	CEDARS Claim Year
PROGRAM_ID	CEDARS Program ID
PROGRAM_NAME	CEDARS Program Name
DELIVERY_TYPE	CEDARS Delivery Type
NORMALIZING_UNIT	CEDARS Normalizing Unit
NUMBER_OF_UNITS	CEDARS Number of Units
FIRST_YEAR_GROSS_KWH	CEDARS First Year Gross kWh Savings
FIRST_YEAR_GROSS_THERM	CEDARS First Year Gross Therm Savings
FIRST_YEAR_NET_KWH	CEDARS First Year Net kWh Savings
FIRST_YEAR_NET_THERM	CEDARS First Year Net Therm Savings
Incentive	Total Incentives Paid - Sum of CEDARS fields for End User Rebate, Incentive to Others, Direct Install Labor, and Direct Install Materials
BENEFITS	CEDARS Benefits total
TRC_COST	CEDARS TRC Cost Total
PAC_COST	CEDARS PAC Cost Total
TRC_RATIO	TRC Ratio = Benefits / TRC_Cost
PAC_RATIO	PAC Ratio = Benefits / PAC_Cost

Row Labels	Values Sum of First_Year_Gross_kWh	Sum of First_Year_Gross_Therm	Sum of First_Year_Net_kWh	Sum of First_Year_Net_Therm	Sum of Incentive	Sum of Benefits	Sum of TRC_Cost	Sum of PAC_Cost	TRC_Rollup	PAC_Rollup
Commercial	**-**	**347,350.10**	**-**	**195,913.72**	**$ 378,177.88**	**$ 2,199,284.23**	**$ 2,960,650.56**	**$ 2,487,682.40**	**0.74**	**0.88**
Gas	**-**	**347,350.10**	**-**	**195,913.72**	**$ 378,177.88**	**$ 2,199,284.23**	**$ 2,960,650.56**	**$ 2,487,682.40**	0.74	0.88
Other	-	17.01	-	9.36	$ 18.90	$ 100.90	$ 160.12	$ 142.82	0.63	0.71
2019	-	17.01	-	9.36	$ 18.90	$ 100.90	$ 160.12	$ 142.82	0.63	0.71
Space Heating	-	185,944.68	-	103,072.19	$ 206,605.20	$ 1,249,031.56	$ 1,489,440.24	$ 1,209,098.34	0.84	1.03
2018	-	164,151.00	-	91,085.67	$ 182,390.00	$ 1,119,934.80	$ 990,776.63	$ 760,305.88	1.13	1.47
2019	-	19,811.88	-	10,896.53	$ 22,013.20	$ 117,495.82	$ 214,097.22	$ 166,329.09	0.55	0.71
2020	-	1,981.80	-	1,089.99	$ 2,202.00	$ 11,600.94	$ 284,566.39	$ 282,463.37	0.04	0.04
Water Heating	-	429.30	-	236.12	$ 477.00	$ 2,513.01	$ 61,545.35	$ 61,187.57	0.04	0.04
2020	-	429.30	-	236.12	$ 477.00	$ 2,513.01	$ 61,545.35	$ 61,187.57	0.04	0.04
WBldgImpAre	-	160,959.11	-	92,596.05	$ 171,076.78	$ 947,638.76	$ 1,409,504.84	$ 1,217,253.67	0.67	0.78
2018	-	26,462.21	-	14,554.22	$ 22,022.24	$ 164,971.24	$ 154,790.84	$ 107,156.19	1.07	1.54
2019	-	134,496.90	-	78,041.84	$ 149,054.54	$ 782,667.52	$ 1,254,714.00	$ 1,110,097.48	0.62	0.71
Residential	**(15,724.30)**	**957,207.53**	**(9,434.58)**	**574,324.52**	**$ 7,226,224.57**	**$ 7,602,945.62**	**$ 20,540,038.20**	**$ 9,624,885.17**	**0.37**	**0.79**
Gas	**(45,989.45)**	**943,019.04**	**(27,593.67)**	**565,811.43**	**$ 7,002,299.57**	**$ 7,425,510.12**	**$ 20,242,754.70**	**$ 9,327,125.17**	0.37	0.80
GasFurnace	-	32,643.50	-	19,586.10	$ 220,650.00	$ 281,802.81	$ 347,361.53	$ 288,782.02	0.81	0.98
2018	-	8,655.30	-	5,193.18	$ 56,950.00	$ 81,880.73	$ 99,667.97	$ 61,199.95	0.82	1.34
2019	-	23,988.20	-	14,392.92	$ 163,700.00	$ 199,922.08	$ 247,693.56	$ 227,582.08	0.81	0.88
Instant_EF	(9,099.38)	142,458.80	(5,459.63)	85,475.28	$ 577,350.00	$ 1,226,381.57	$ 2,869,176.43	$ 648,932.61	0.43	1.89
2018	(9,099.38)	142,458.80	(5,459.63)	85,475.28	$ 577,350.00	$ 1,226,381.57	$ 2,869,176.43	$ 648,932.61	0.43	1.89
Instant_UEF	(36,890.07)	597,804.90	(22,134.04)	358,682.94	$ 5,903,550.00	$ 4,647,814.72	$ 15,773,302.09	$ 7,635,484.84	0.29	0.61
2019	(16,685.23)	276,556.10	(10,011.14)	165,933.66	$ 2,233,825.00	$ 2,083,436.48	$ 6,968,155.36	$ 2,874,871.91	0.30	0.72
2020	(20,204.84)	321,248.80	(12,122.90)	192,749.28	$ 3,669,725.00	$ 2,564,378.23	$ 8,805,146.73	$ 4,760,612.94	0.29	0.54
WBldgImpSite	-	170,111.84	-	102,067.11	$ 300,749.57	$ 1,269,511.03	$ 1,252,914.65	$ 753,925.70	1.01	1.68
2018	-	109,672.48	-	65,803.49	$ 156,267.44	$ 851,195.43	$ 736,010.27	$ 393,634.78	1.16	2.16
2019	-	34,196.62	-	20,517.98	$ 5,228.98	$ 232,002.47	$ 321,907.30	$ 192,720.20	0.72	1.20
2020	-	26,242.74	-	15,745.64	$ 139,253.15	$ 186,313.12	$ 194,997.09	$ 167,570.71	0.96	1.11
Mixed	**30,265.15**	**14,188.49**	**18,159.09**	**8,513.09**	**$ 223,925.00**	**$ 177,435.49**	**$ 297,283.49**	**$ 297,760.00**	0.60	0.60
GasFurnace	30,265.15	14,188.49	18,159.09	8,513.09	$ 223,925.00	$ 177,435.49	$ 297,283.49	$ 297,760.00	0.60	0.60
2020	30,265.15	14,188.49	18,159.09	8,513.09	$ 223,925.00	$ 177,435.49	$ 297,283.49	$ 297,760.00	0.60	0.60
Zero	**-**	**-**	**-**	**-**	**$ -**	**$ -**	**$ -**	**$ -**		
Instant_UEF	-	-	-	-	$ -	$ -	$ -	$ -		
2019	-	-	-	-	$ -	$ -	$ -	$ -		
2020	-	-	-	-	$ -	$ -	$ -	$ -		
Grand Total	**(15,724.30)**	**1,304,557.63**	**(9,434.58)**	**770,238.24**	**$ 7,604,402.45**	**$ 9,802,229.85**	**$ 23,500,688.75**	**$ 12,112,567.57**	**1.11**	**1.67**

Docket No: R.13-11-005

Sierra Club

Attachment B

SDG&E's Response to
Sierra Club/NRDC Data Request Sierra Club/NRDC-SDGE-01

SDG&E Response
Data Request Dated November 8, 2021
Sierra Club/NRDC Data Request Sierra Club/NRDC-SDGE-01
Requestor: Matt Vespa
Date Submitted: November 23, 2021

PRELIMINARY STATEMENT

1. SDG&E will produce responses only to the extent that such response is based upon personal knowledge or documents in the possession, custody, or control of SDG&E. SDG&E's possession, custody, or control does not include any constructive possession that may be conferred by SDG&E's right or power to compel the production of documents or information from third parties or to request their production from other divisions of the Commission.

2. SDG&E expressly reserves the right to supplement, clarify, revise, or correct any or all of the responses herein, and to assert additional objections or privileges, in one or more subsequent supplemental response(s).

3. Unless otherwise indicated, publicly available information and documents including, but not limited to, newspaper clippings, court papers, and materials available on the Internet, will not be produced.

4. With respect to the data request "Instructions," SDG&E objects to those seeking information or action beyond what is required by general discovery custom practice and applicable discovery rules and laws, including Rule 10.1 of the Rules of Practice and Procedure of the California Public Utilities Commission.

SDG&E RESPONSE:

SDG&E objects to this request insofar as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined. Without waiving these objections, SDG&E provides the following response:

1. For 2018, 2019, and 2020, please provide the following information

   a. The total dollar amount spent under SDG&E efficiency programs on incentives (upstream, midstream and downstream) for new gas-powered technologies for each of the following

      i. Residential water heating. Where data is available, please separate between incentives to single and multi-family homes.

      ii. Residential single-family space heating. Where data is available, please separate between incentives to single and multi-family homes.

SDG&E Response: For response to 1(a)(i) and (ii) please refer to the attached Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx". SDG&E data queried measures from the "3P-Res-Comprehensive Manufactured-Mobile Home", "RES Upstream HVAC Incentive Program", "SW-CALS-Plug Load and Appliances-HEER", "SW-CALS-Plug Load and Appliances-POS Rebates", and "HOPPs - Multi Family" programs.

iii. All other new gas technologies for residential customers not included in *i and ii* above

SDG&E Response: SDG&E objects to this request insofar as it as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined. The request contains several terms that are not defined including "new" and "technologies". For this reason, SDG&E is unable to provide a response to this subpart.

iv. Non-residential water heating

SDG&E Response: Please refer to Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx" for response. SDG&E data queried measures from the "SW-COM-Calculated Incentives-Calculated, "SW-COM-Calculated Incentives-Savings by Design", "SW-COM-Deemed Incentives-Commercial Rebates", and "SW-COM Direct Install" programs.

v. Non-residential space heating in each category

1. Gas boiler

2. Rooftop unit

3. Other

SDG&E Response: SDG&E objects to this request insofar as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined such as "rooftop unit" and "other". Without waiving these objections, SDG&E provides the following response: Please refer to Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx" for response regarding Gas Boilers. SDG&E has not provided incentives for other types of non-residential space heating other than gas boilers for the time period requested. SDG&E data queried measures from the "SW-COM-Calculated Incentives-Calculated" and "SW-IND-Calculated Incentives-Calculated" programs.

vi. Non-residential pool heating

SDG&E Response: SDG&E objects to this request insofar as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined. Without waiving these objections, SDG&E provides the following response: Please refer to Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx" for response regarding non-residential pool heating. SDG&E data queried measures from the "SW-COM-Calculated Incentives-Calculated" program.

vii. Other non-residential gas appliances

SDG&E Response: SDG&E objects to this request insofar as it as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined. For this reason, SDG&E is unable to provide a response to this subpart.

b. The total dollar amount spent under SDG&E efficiency programs on incentives (upstream, midstream and downstream) for new electric-powered technologies for each of the following:

i. Residential water heating. Where data is available, please separate between incentives to single and multi-family homes.

ii. Residential single-family space heating. Where data is available, please separate between incentives to single and multi-family homes.

SDG&E Response: For response to 1(b)(i) and (ii) please refer to the attached Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx" for response. SDG&E data queried measures from the "3P-Res-Comprehensive Manufactured-Mobile Home", "RES Upstream HVAC Incentive Program", "SW-CALS-Plug Load and Appliances-HEER", and "SW-CALS-Plug Load and Appliances-POS Rebates" programs.

iii. All other new electric technologies for residential customers not included in *i and ii* above

SDG&E Response: SDG&E objects to this request insofar as it as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined. The request contains several terms that are not defined including "new" and "technologies". For this reason, SDG&E is unable to provide a response to this subpart.

iv. Non-residential water heating

SDG&E Response: Please refer to Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx" for response. SDG&E data queried measures from the "SW-COM-Calculated Incentives-Savings by Design" program.

v. Non-residential space heating

SDG&E Response: Please refer to Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx" for response. SDG&E data queried measures from the "SW-COM-Deemed Incentives-HVAC Commercial" and "SW-COM-Calculated Incentives-Calculated" programs.

vi. Non-residential pool heating

SDG&E Response: SDG&E has not provided an incentive for non-residential pool heating during the years requested.

vii. Other non-residential electric appliances

SDG&E Response: SDG&E objects to this request insofar as it as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined. For this reason, SDG&E is unable to provide a response to this subpart.

c. For each of the appliance categories identified above, the program name incentivizing the appliance, the average cost effectiveness, and the total quantity of appliances incentivized

SDG&E Response: SDG&E objects to this request insofar as it as it is overbroad, vague, and ambiguous to the extent that it relies on terminology that is not defined. In this request, "average cost effectiveness" has not been defined. In addition, to the extent the request imposes an obligation on SDG&E to generate or create records or data which do not exist, and which have not been generated or created in its regular course of business, which requirement exceeds the requirements provided by the CPUC's Discovery Custom and Practice Guidelines and the California Code of Civil Procedure Section 2031.230 (proper response stating inability to comply with discovery requested includes a statement that "the particular item or category [of records] has never existed."). *See also* A.05-04-020, *In the Matter of the Joint Application of Verizon Communications Inc. and MCI, Inc.*, Administrative Law Judge's Ruling Addressing Motion of Qwest to Compel Responses, Aug. 5, 2005, at p. 7 (regarding motion to compel, emphasizing that "Verizon is not required to create new documents responsive to the data request") (also available at 2005 WL 1866062); A.05-02-027, *In the Matter of the Joint Application of SBC Communications Inc. and AT&T Corp.*, Administrative Law Judge's Ruling Regarding ORA's Second Motion to Compel, June 8, 2005, at p.23 (on motion to compel, stressing that SBC Communications "shall not be required to produce new studies specifically in response to this DR") (also available at 2005 WL 1660395).

Without waiving these objections, SDG&E provides the following response: Please refer to Excel spreadsheet entitled "NRDC-SDGE-01(Response_11-23-2021_v1).xlsx" for response. SDG&E has included the dollar values of the Total Resource Cost benefits and costs and the TRC ratio.

Fuel	ImplementSectorCode	Multi_Family	EndUse	Technology	NumUnits	NormUnit
B = Both Electric and Gas	N = Nonresidential	N = No	Concatenation of DEER fields:	Technology categories listed in data request determined by EndUse field.	Quantity installed	Quantity unit definition
E = Electric Only	R = Residential	Y = Yes	UseCategory, UseSubCat, TechGroup, TechType			
G = Gas Only						

AnnualReportYear	Fuel	ImplementSectorCode	Multi_Family	EndUse	PrgID	ProgramName	ImplementationID	ImplementDesc	Technology	NumUnits	NormUnit	TotalIncentive	TRCBenefit	TRCCost	TRC
2018	E	N	N	HVAC-HeatCool-dxHP_equip-pkgSEER	SDGE3224	SW-COM-Deemed Incentives-HVAC Commercial	463734	Pkg HP <55k SEER = 16.0-Rebate	Space Heating	54	Cap-Tons	$ 3,618	$ 12,654	$ 29,300	0.43
2018	E	N	N	HVAC-HeatCool-dxHP_equip-spltSEER	SDGE3224	SW-COM-Deemed Incentives-HVAC Commercial	463746	Split HP < 55k SEER = 17.0	Space Heating	9	Cap-Tons	$ 672	$ 1,892	$ 8,266	0.23
2018	E	N	N	HVAC-SpaceHeat-Motor_Spd-ASD	SDGE3220	SW-COM-Calculated Incentives-Calculated	463148	HVAC - Space Heating - VSD/VFD Hot Water Pumps - REA	Space Heating	2	Building	$ 40	$ 193	$ 1,347	0.14
2018	E	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3203	SW-CALS-Plug Load and Appliances-HEER	465952	Efficient water heater: 50 to 55 gallon HP Elec (UEF=3.31) replaces =35 gallon Electric water heater (UEF = 0.92)	Water Heating	23	Each	$ 7,650	$ 21,265	$ 62,527	0.34
2018	E	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465951	Efficient water heater: 50 to 55 gallon HP Elec (UEF=3.09) replaces =35 gallon Electric water heater (UEF = 0.92)	Water Heating	128	Each	$ 72,342	$ 84,265	$ 96,425	0.87
2018	G	N	N	HVAC-HeatCool-SteamHtg_eq-Boiler_Et	SDGE3220	SW-COM-Calculated Incentives-Calculated	463150	HVAC - HeatingCooling - HVAC Boiler - ROB	Space Heating - Gas Boiler	7	Building	$ 541	$ 111,668	$ 219,354	0.51
2018	G	N	N	Recreate-Pool-PoolSpa_eq-PoolHeater	SDGE3220	SW-COM-Calculated Incentives-Calculated	464072	Recreation - Pool/Spa - WaterHeater - Gas - ROB	Pool Heating	1	Cap-kBTUh	$ 5,653	$ 18,843	$ 51,969	0.36
2018	G	N	N	SHW-Distribute-WaterHtg_eq-Boiler_Et	SDGE3220	SW-COM-Calculated Incentives-Calculated	463237	Service & Domestic Water - Boiler - ROB	Water Heating	1	Building	$ 11,036	$ 162,013	$ 85,344	1.90
2018	G	N	N	WhlBldg-WBUpgrade-WhlBldg-WBldgImpSite	SDGE3222	SW-COM-Calculated Incentives-Savings by Design	463605	Systems - Natural Gas Water Heating	Water Heating	2	kWh	$ 5,026	$ 38,547	$ 21,317	1.81
2018	G	R	N	HVAC-SpaceHeat-SpaceHtg_eq-GasFurnace	SDGE3279	3P-Res-Comprehensive Manufactured-Mobile Home	462514	Furnace - Energy Star Central Gas (AFUE=96%)	Space Heating	485	Cap-kBTUh	$ 1,040	$ 1,142	$ 3,292	0.35
2018	G	R	N	HVAC-SpaceHeat-SpaceHtg_eq-GasFurnace	SDGE3302	RES Upstream HVAC Incentive Program	462819	Furnance 96% AFUE Furnace	Space Heating	2,560	Cap-kBTUh	$ 8,855	$ 9,091	$ 69,077	0.13
2018	G	R	N	SHW-Heating-WaterHtg_eq-Instant_EF	SDGE3279	3P-Res-Comprehensive Manufactured-Mobile Home	465972	Small Tankless Water Heater, Tier 2 (UEF>=0.87), Low Draw	Water Heating	5	Each	$ 1,582	$ 2,012	$ 6,538	0.31
2018	G	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3203	SW-CALS-Plug Load and Appliances-HEER	465945	Natural Gas W/H 50 Gal UEF (0.64)	Water Heating	67	Each	$ 6,700	$ 9,400	$ 34,392	0.27
2018	G	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465945	Natural Gas W/H 50 Gal UEF (0.64)	Water Heating	1,107	Each	$ 178,796	$ 156,613	$ 244,242	0.64
2018	G	R	Y	SHW-Heating-WaterHtg_eq-Boiler_Et	SDGE3318	HOPPs - Multi Family	464043	Domestic Hot Water Boiler TE = 90% and input rating > 75MBtuh	Water Heating	27,661	Cap-kBTUh	$ 1,217,914	$ 783,458	$ 1,368,574	0.57
2018	G	R	Y	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465945	Natural Gas W/H 50 Gal UEF (0.64)	Water Heating	4	Each	$ 823	$ 505	$ 943	0.54
2019	E	N	N	HVAC-HeatCool-dxHP_equip-pkgSEER	SDGE3224	SW-COM-Deemed Incentives-HVAC Commercial	463670	Pkg HP <55k SEER = 16.0-UP Stream (SWHC014V)	Space Heating	330	Cap-Tons	$ 41,456	$ 90,177	$ 249,880	0.36
2019	E	N	N	HVAC-HeatCool-dxHP_equip-spltSEER	SDGE3224	SW-COM-Deemed Incentives-HVAC Commercial	463747	Split HP < 55k SEER = 18.0	Space Heating	53	Cap-Tons	$ 9,066	$ 13,903	$ 82,240	0.17
2019	E	R	N	HVAC-HeatCool-dxHP_equip-spltSEER	SDGE3302	RES Upstream HVAC Incentive Program	463763	Heat Pumps Split System, SEER = 17 (EER = 13.3), HSPF = 9.4 (COP = 3.74)	Space Heating	183	Cap-Tons	$ 51,483	$ 3,150	$ 180,466	0.02
2019	E	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3203	SW-CALS-Plug Load and Appliances-HEER	465952	Efficient water heater, 45 to 55 gal HP Elec (UEF=3.31) replaces =35 gal Electric WH (UEF = 0.92), (SWWH014B)	Water Heating	33	Each	$ 11,550	$ 31,142	$ 113,692	0.27
2019	E	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465952	Efficient water heater, 45 to 55 gal HP Elec (UEF=3.31) replaces =35 gal Electric WH (UEF = 0.92), (SWWH014B)	Water Heating	170	Each	$ 110,523	$ 129,531	$ 238,126	0.54
2019	E	R	Y	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465952	Efficient water heater, 45 to 55 gal HP Elec (UEF=3.31) replaces =35 gal Electric WH (UEF = 0.92), (SWWH014B)	Water Heating	4	Each	$ 2,428	$ 3,379	$ 5,844	0.58
2019	G	N	N	WhlBldg-WBUpgrade-WhlBldg-WBldgImpSite	SDGE3222	SW-COM-Calculated Incentives-Savings by Design	463605	Systems - Natural Gas Water Heating	Water Heating	5	kWh	$ 16,796	$ 97,133	$ 62,364	1.56
2019	G	R	N	HVAC-SpaceHeat-SpaceHtg_eq-GasFurnace	SDGE3302	RES Upstream HVAC Incentive Program	462819	Furnance 96% AFUE Furnace	Space Heating	4,893	Cap-kBTUh	$ 22,812	$ 15,499	$ 180,593	0.09
2019	G	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3203	SW-CALS-Plug Load and Appliances-HEER	465946	Natural Gas W/H 50 Gal UEF (0.68) (SWWH012I)	Water Heating	78	Each	$ 7,800	$ 10,778	$ 45,914	0.23
2019	G	R	N	SHW-Heating-WaterHtg_eq-Stor_EF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465946	Natural Gas W/H 50 Gal UEF (0.68) (SWWH012I)	Water Heating	1,237	Each	$ 229,489	$ 192,422	$ 414,836	0.46
2020	B	N	N	HVAC-HeatCool-SteamHtg_eq-Boiler_Et	SDGE3231	SW-IND-Calculated Incentives-Calculated	463150	HVAC - HeatingCooling - HVAC Boiler - NR	Space Heating - Gas Boiler	1	Building	$ 3,684	$ 23,069	$ 8,128	2.84
2020	E	N	N	HVAC-SpaceHeat-Motor_Spd-ASD	SDGE3220	SW-COM-Calculated Incentives-Calculated	463148	HVAC - Space Heating - VSD/VFD Hot Water Pumps - AOE	Space Heating	1	Building	$ 1,976	$ 5,741	$ 12,086	0.48
2020	E	N	N	WhlBldg-WBUpgrade-WhlBldg-WBldgImpSite	SDGE3222	SW-COM-Calculated Incentives-Savings by Design	463605	Systems - Natural Gas Water Heating	Water Heating	1	kWh	$ 440	$ 1,449	$ 23,830	0.06
2020	E	R	N	SHW-Heating-WaterHtg_eq-HP_UEF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465960	Efficient water heater, 45 to 55 gal HP Elec (UEF=3.31) replaces at and below 35 gal Electric WH, UEF 0.92, (SWWH014B)	Water Heating	240	Each	$ 100,100	$ 215,392	$ 336,090	0.64
2020	G	N	N	SHW-Heating-WaterHtg_eq-Stor_Et	SDGE3223	SW-COM-Deemed Incentives-Commercial Rebates	463333	Water Heating - Lg Storage Water Heater TE>=0.90 (SWWH007H)	Water Heating	597	Cap-kBTUh	$ 1,194	$ 7,558	$ 7,196	1.05
2020	G	N	N	SHW-Heating-WaterHtg_eq-Stor_UEF	SDGE3226	SW-COM Direct Install	465438	Water Heating - Storage Water Heater UEF >=0.64, 30 gallon MedDraw (SWWH007B)	Water Heating	29	Cap-kBTUh	$ 58	$ 77	$ 134	0.58
2020	G	N	N	WhlBldg-WBUpgrade-WhlBldg-WBldgImpSite	SDGE3222	SW-COM-Calculated Incentives-Savings by Design	463605	Systems - Natural Gas Water Heating	Water Heating	1	kWh	$ 626	$ 3,836	$ 1,928	1.99
2020	G	R	N	SHW-Heating-WaterHtg_eq-Stor_UEF	SDGE3204	SW-CALS-Plug Load and Appliances-POS Rebates	465950	Natural Gas W/H 50 Gal UEF (0.68) (SWWH012I)	Water Heating	1,250	Each	$ 138,750	$ 213,790	$ 397,244	0.54

Docket No: R.13-11-005

Sierra Club

Attachment C

PG&E's Response to Data Request
Sierra Club/NRDC-PG&E-01

PACIFIC GAS AND ELECTRIC COMPANY
Energy Efficiency 2015 and Beyond Rolling Portfolios
Rulemaking 13-11-005
Data Response

PG&E Data Request No.:	NRDC-SierraClub_001-Q01		
PG&E File Name:	EnergyEfficiency2015-BeyondRollingPortfolios_DR_NRDC-SierraClub_001-Q01		
Request Date:	November 3, 2021	Requester DR No.:	Sierra Club/NRDC-PG&E-01
Date Sent:	November 17, 2021	Requesting Party:	Natural Resources Defense Council/Sierra Club
PG&E Witness:	Jake Richardson	Requester:	Matt Vespa

QUESTION 01

For 2018, 2019, and 2020, please provide the following information:

a. The total dollar amount spent under PG&E efficiency programs on incentives (upstream, midstream and downstream) for new gas-powered technologies for each of the following
   i. Residential water heating. Where data is available, please separate between incentives to single and multi-family homes.
   ii. Residential single-family space heating. Where data is available, please separate between incentives to single and multi-family homes.
   iii. All other new gas technologies for residential customers not included in i and ii above
   iv. Non-residential water heating
   v. Non-residential space heating in each category
      1. Gas boiler
      2. Rooftop unit
      3. Other
   vi. Non-residential pool heating
   vii. Other non-residential gas appliances
b. The total dollar amount spent under PG&E efficiency programs on incentives (upstream, midstream and downstream) for new electric-powered technologies for each of the following:
   i. Residential water heating. Where data is available, please separate between incentives to single and multi-family homes.
   ii. Residential single-family space heating. Where data is available, please separate between incentives to single and multi-family homes.
   iii. All other new electric technologies for residential customers not included in i and ii above
   iv. Non-residential water heating

v. Non-residential space heating

vi. Non-residential pool heating

vii. Other non-residential electric appliances

c. For each of the appliance categories identified above, the program name incentivizing the appliance, the average cost effectiveness, and the total quantity of appliances incentivized.

ANSWER 01

PG&E respectfully supplies the requested data and supporting documentation in the attached files, in excel, comma-delimited, and R format.

File Name	Contents	Confidential Data?	Size (full, uncompressed)
DR_NRDC-SierraClub_001-Q01Atch01.xlsx	Requested Data and Data Dictionary	NO	2,526 KB
DR_NRDC-SierraClub_001-Q01Atch02.zip	Data analysis code and supporting documents	NO	4 KB

Please note the following things in relation to the data response:

- The data used in the analysis is public and was retrieved from the California Energy Data and Reporting System (CEDARS), record level claim data, found at the following URL: https://cedars.sound-data.com/reports/record-level/
- Only data with PG&E listed as the PA associated with the claim was analyzed.
- The following program categories were excluded:
  - Codes and Standards (C&S)
  - Workforce Education and Training (WE&T)
  - Energy Savings Performance Incentive (ESPI)
  - Evaluation Measurement and Verification (EM&V)
  - Energy Savings Assistance (ESA)
- Claims were categorized into the requested types manually, using the measure code field as the primary identifier.
- Claims were categorized into the following fuel types:
  - 'Gas' if Therms savings are > 0 and kWh savings are <= 0
  - 'Electric' if kWh savings are > 0 and Therms savings are <= 0
  - 'Mixed' if both kWh and Therms savings are > 0
  - 'Zero' if no savings were recorded for a claim. These claims typically just have costs assigned, and were difficult to categorize.
- Claims were split into Residential and Non-Residential based on the CEDARS Primary Sector field
- Claims were split into Upstream / Downstream based on the CEDARS Measure Upstream Flag field.

- Data was aggregated based on the supplied fields to provide the most compact data response possible, while leaving enough granularity for any analysis.

If there are any questions on the data response, please reach out the Jake Richardson at Jake.Richardson@pge.com.

Field Name	Description
FUEL_TYPE	Fuel Source Type: Gas, Electric, Mixed, or Zero Considered 'Gas' if Therms savings are > 0 and kWh savings are <= 0 Considered 'Electric' if kWh savings are > 0 and Therms savings are <= 0 Considered 'Mixed' if both kWh and Therms savings are > 0 Considered 'Zero' if no savings were recorded for a claim.
SECTOR	'Residential' if CEDARS Primary Sector is Residential, otherwise 'Non-Residential'
TYPE	Claims categorized into Types according to data request
MEASURE_CODE	CEDARS Measure Code for these claims
MEASURE_DESCRIPTION	CEDARS Measure Description for these claims
MEASURE_TECHNOLOGY_ID	CEDARS Measure Technology ID
TECHNOLOGY_GROUP	CEDARS Technology Group
TECHNOLOGY_TYPE	CEDARS Technology Type
USE_CATEGORY	CEDARS Use Category
USE_SUBCATEGORY	CEDARS Use Sub-Category
PREEXISTING_TECHNOLOGY_DESCRIPTION	CEDARS Pre-Existing Technology Description
STANDARD_TECHNOLOGY_DESCRIPTION	CEDARS Standard Technology Description
BUILDING_TYPE	CEDARS Building Type
YEAR	CEDARS Claim Year
PROGRAM_ID	CEDARS Program ID
PROGRAM_NAME	CEDARS Program Name
DELIVERY_TYPE	CEDARS Delivery Type
NORMALIZING_UNIT	CEDARS Normalizing Unit
NUMBER_OF_UNITS	CEDARS Number of Units
FIRST_YEAR_GROSS_KWH	CEDARS First Year Gross kWh Savings
FIRST_YEAR_GROSS_THERM	CEDARS First Year Gross Therm Savings
FIRST_YEAR_NET_KWH	CEDARS First Year Net kWh Savings
FIRST_YEAR_NET_THERM	CEDARS First Year Net Therm Savings
TOTAL_INCENTIVES	Total Incentives Paid - Sum of CEDARS fields for End User Rebate, Incentive to Others, Direct Install Labor, and Direct Install Materials
BENEFITS	CEDARS Benefits total
TRC_COST	CEDARS TRC Cost Total
PAC_COST	CEDARS PAC Cost Total
TRC_RATIO	TRC Ratio = Benefits / TRC_Cost
PAC_RATIO	PAC Ratio = Benefits / PAC_Cost

Row Labels	Sum of FIRST_YEAR_GROSS_KWH	Sum of FIRST_YEAR_GROSS_THERM	Sum of FIRST_YEAR_NET_KWH	Sum of FIRST_YEAR_NET_THERM	Sum of TOTAL_INCENTIVES	Sum of BENEFITS	Sum of TRC_COST	Sum of PAC_COST	Sum of Rollup TRC Ratio	Sum of Rollup PAC Ratio
RESIDENTIAL	**193,741,164**	**-3,146,477**	**173,083,819**	**-3,094,776**	**$34,128,990**	**$161,145,165**	**$70,350,764**	**$39,584,118**	**2.29**	**4.07**
Electric	**187,418,960**	**-3,464,059**	**170,807,826**	**-3,213,950**	**$32,203,815**	**$157,858,966**	**$64,540,336**	**$36,510,284**	**2.45**	**4.32**
Water Heati	2,111,556	0	1,267,929	0	$473,045	$864,745	-$407,377	-$615,298	-2.12	-1.41
2018	426,516	0	255,909	0	$74,400	$170,924	$188,249	$132,564	0.91	1.29
2019	899,760	0	539,856	0	$189,578	$325,515	$804,227	$693,632	0.40	0.47
2020	785,280	0	472,164	0	$209,067	$368,305	-$1,399,854	-$1,441,493	-0.26	-0.26
Space Heatir	748,879	-893	318,920	-714	$507,260	$341,333	$773,246	$660,635	0.44	0.52
2018	748,879	-893	318,920	-714	$507,260	$341,333	$773,246	$660,635	0.44	0.52
Other	184,558,525	-3,463,167	169,220,976	-3,213,236	$31,223,510	$156,652,887	$64,174,468	$36,464,947	2.44	4.30
2018	73,179,842	-1,325,625	62,297,548	-1,161,197	$12,608,178	$56,397,476	$35,357,234	$16,070,342	1.60	3.51
2019	111,378,683	-2,137,542	106,923,428	-2,052,038	$18,615,332	$100,255,411	$28,817,234	$20,394,604	3.48	4.92
Gas	**0**	**97,913**	**0**	**40,093**	**$441,991**	**$412,083**	**$1,347,543**	**$624,705**	**0.31**	**0.66**
Water Heati	0	12,833	0	7,700	$60,375	$75,308	$135,483	$85,993	0.56	0.88
2018	0	12,833	0	7,700	$60,375	$75,308	$135,483	$85,993	0.56	0.88
Space Heatir	0	4,010	0	3,208	$25,366	$52,946	$117,648	$93,151	0.45	0.57
2018	0	4,010	0	3,208	$25,366	$52,946	$117,648	$93,151	0.45	0.57
Other	0	81,070	0	29,185	$356,250	$283,829	$1,094,413	$445,562	0.26	0.64
2018	0	81,070	0	29,185	$356,250	$283,829	$1,094,413	$445,562	0.26	0.64
Mixed	**6,322,204**	**219,670**	**2,275,993**	**79,081**	**$1,071,560**	**$2,874,116**	**$4,386,968**	**$2,055,032**	**0.66**	**1.40**
Other	6,322,204	219,670	2,275,993	79,081	$1,071,560	$2,874,116	$4,386,968	$2,055,032	0.66	1.40
2018	6,322,204	219,670	2,275,993	79,081	$1,071,560	$2,874,116	$4,386,968	$2,055,032	0.66	1.40
Zero	**0**	**0**	**0**	**0**	**$411,624**	**$0**	**$75,917**	**$394,097**	**0.00**	**0.00**
Water Heati	0	0	0	0	$61,752	$0	$62,311	$59,344	0.00	0.00
2019	0	0	0	0	$22,486	$0	$22,617	$21,540	0.00	0.00
2020	0	0	0	0	$39,266	$0	$39,694	$37,804	0.00	0.00
Space Heatir	0	0	0	0	$13,072	$0	$13,606	$12,649	0.00	0.00
2018	0	0	0	0	$13,072	$0	$13,606	$12,649	0.00	0.00
Other	0	0	0	0	$336,800	$0	$0	$322,104	#DIV/0!	0.00
2018	0	0	0	0	$336,800	$0	$0	$322,104	#DIV/0!	0.00
NON-RESIDENTIAL	**439,034,334**	**22,871,231**	**353,980,558**	**14,395,710**	**$122,861,872**	**$424,788,201**	**$480,087,095**	**$288,165,060**	**0.88**	**1.47**
Electric	**400,310,011**	**-2,033,425**	**328,418,293**	**-1,676,718**	**$81,452,853**	**$208,157,562**	**$325,416,451**	**$198,484,870**	**0.64**	**1.05**
Water Heati	35,528	0	19,540	0	$4,082	$17,964	$86,297	$17,085	0.21	1.05
2019	35,528	0	19,540	0	$4,082	$17,964	$86,297	$17,085	0.21	1.05
Space Heatir	25,714,606	-133,586	20,289,420	-106,592	$16,488,476	$20,248,644	$40,730,628	$30,828,379	0.50	0.66
2018	11,246,100	-52,085	8,977,054	-41,668	$7,600,191	$9,023,126	$18,836,020	$14,279,186	0.48	0.63
2019	11,391,275	-65,137	9,030,272	-52,110	$6,916,712	$9,295,215	$16,506,946	$12,200,442	0.56	0.76
2020	3,077,231	-16,365	2,282,094	-12,814	$1,971,573	$1,930,304	$5,387,662	$4,348,751	0.36	0.44
Other	374,559,877	-1,899,839	308,109,333	-1,570,126	$64,960,296	$187,890,955	$284,599,526	$167,639,406	0.66	1.12
2018	136,324,091	-645,276	98,557,795	-456,546	$27,208,558	$68,430,157	$99,157,133	$64,055,184	0.69	1.07
2019	149,164,080	-840,396	126,281,600	-725,769	$26,210,432	$84,074,333	$133,775,320	$70,865,037	0.63	1.19
2020	89,071,706	-414,166	83,269,938	-387,812	$11,541,305	$35,386,465	$51,667,073	$32,719,184	0.68	1.08
Gas	**-427,752**	**21,313,521**	**-275,297**	**13,694,177**	**$27,017,542**	**$165,873,485**	**$104,881,822**	**$58,304,555**	**1.58**	**2.84**
Water Heati	-427,752	17,749,373	-275,297	11,285,825	$22,099,835	$145,473,729	$92,882,958	$48,970,943	1.57	2.97
2018	-378,060	8,066,697	-245,739	5,068,047	$8,978,242	$69,845,370	$42,030,252	$19,995,723	1.66	3.49
2019	0	5,843,179	0	3,723,664	$7,539,585	$44,929,033	$33,933,536	$17,657,520	1.32	2.54
2020	-49,692	3,839,497	-29,558	2,494,113	$5,582,008	$30,699,326	$16,919,171	$11,317,700	1.81	2.71
Space Heatir	0	3,418	0	2,222	$21,760	$31,126	$65,871	$52,629	0.47	0.59
2018	0	1,959	0	1,274	$5,850	$18,722	$39,982	$34,217	0.47	0.55
2019	0	1,459	0	948	$15,910	$12,404	$25,889	$18,412	0.48	0.67
Pool Heating	0	550,567	0	435,883	$494,851	$1,828,582	$1,520,818	$1,250,309	1.20	1.46
2018	0	238,507	0	155,030	$212,133	$658,106	$654,417	$640,864	1.01	1.03
2019	0	173,607	0	156,247	$158,987	$628,210	$277,593	$284,390	2.26	2.21
2020	0	138,452	0	124,607	$123,732	$542,266	$588,808	$325,056	0.92	1.67
Other	0	3,010,164	0	1,970,247	$4,401,096	$18,540,049	$10,412,175	$8,030,674	1.78	2.31
2018	0	1,257,937	0	817,659	$1,704,878	$8,049,903	$3,736,515	$2,965,855	2.15	2.71
2019	0	1,034,304	0	679,106	$1,401,822	$6,029,712	$3,814,015	$2,778,784	1.58	2.17
2020	0	717,923	0	473,482	$1,294,396	$4,460,433	$2,861,644	$2,286,035	1.56	1.95
Mixed	**39,152,075**	**3,591,134**	**25,837,562**	**2,378,251**	**$7,797,179**	**$50,757,154**	**$43,046,523**	**$25,102,760**	**1.18**	**2.02**
Water Heati	1,525,250	1,934,678	1,007,570	1,279,414	$4,012,395	$20,704,777	$20,368,537	$7,902,306	1.02	2.62
2018	14,027	30,072	9,118	19,547	$22,740	$295,211	$152,164	$69,646	1.94	4.24
2019	1,640	4,033	1,066	2,621	$3,590	$35,029	$25,830	$11,333	1.36	3.09
2020	1,509,583	1,900,573	997,386	1,257,245	$3,986,064	$20,374,537	$20,190,543	$7,821,327	1.01	2.60
Space Heatir	3,608,740	84,526	2,563,895	59,275	$1,395,982	$2,893,947	$5,471,938	$4,617,219	0.53	0.63
2018	147,571	4,038	116,344	2,789	$80,406	$163,903	$271,774	$239,299	0.60	0.68
2019	115,362	648	92,289	518	$48,800	$99,588	$131,564	$102,881	0.76	0.97
2020	3,345,807	79,840	2,355,262	55,967	$1,266,776	$2,630,456	$5,068,600	$4,275,039	0.52	0.62
Other	34,018,085	1,571,930	22,266,097	1,039,562	$2,388,803	$27,158,429	$17,206,047	$12,583,234	1.58	2.16
2018	26,786,728	1,112,823	17,467,216	730,211	$1,759,502	$20,906,504	$12,322,447	$8,798,644	1.70	2.38
2019	6,022,271	315,473	3,991,854	215,490	$450,224	$4,745,206	$3,384,320	$2,596,635	1.40	1.83
2020	1,209,086	143,634	807,027	93,862	$179,077	$1,506,719	$1,499,281	$1,187,956	1.00	1.27
Zero	**0**	**0**	**0**	**0**	**$6,594,297**	**$0**	**$6,742,299**	**$6,272,875**	**0.00**	**0.00**

Water Heati	0	0	0	0	$4,799	$0	$6,213	$4,620	0.00	0.00
2018	0	0	0	0	$4,799	$0	$6,213	$4,620	0.00	0.00
Other	0	0	0	0	$6,589,498	$0	$6,736,087	$6,268,255	0.00	0.00
2018	0	0	0	0	$6,328,746	$0	$6,471,715	$6,014,686	0.00	0.00
2019	0	0	0	0	$260,743	$0	$264,354	$253,561	0.00	0.00
2020	0	0	0	0	$10	$0	$18	$9	0.00	0.00
Grand Total	**632,775,498**	**19,724,755**	**527,064,377**	**11,300,934**	**$156,990,861**	**$585,933,365**	**$550,437,859**	**$327,749,178**	**1.06**	**1.79**