

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



Pacific Gas & Electric Company
ELC (Corp ID 39)
Status of Advice Letter 4571G/6497E
As of January 23, 2023

Subject: Net Electric and Gas Bill Impact Study for Residential Customers Who Switch from Natural Gas Water Heater to Heat Pump Water Heater in Compliance with D.21-11-002

Division Assigned: Energy

Date Filed: 02-07-2022

Date to Calendar: 02-09-2022

Authorizing Documents: D2111002

Disposition:	Signed
Effective Date:	12-01-2022

Resolution Required: Yes

Resolution Number: E-5233

Commission Meeting Date: 12-01-2022

CPUC Contact Information:

edtariffunit@cpuc.ca.gov

AL Certificate Contact Information:

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415-973-8794

PGETariffs@pge.com

PUBLIC UTILITIES COMMISSION
505 Van Ness Avenue
San Francisco CA 94102-3298



To: Energy Company Filing Advice Letter

From: Energy Division PAL Coordinator

Subject: Your Advice Letter Filing

The Energy Division of the California Public Utilities Commission has processed your recent Advice Letter (AL) filing and is returning an AL status certificate for your records.

The AL status certificate indicates:

- Advice Letter Number
- Name of Filer
- CPUC Corporate ID number of Filer
- Subject of Filing
- Date Filed
- Disposition of Filing (Accepted, Rejected, Withdrawn, etc.)
- Effective Date of Filing
- Other Miscellaneous Information (e.g., Resolution, if applicable, etc.)

The Energy Division has made no changes to your copy of the Advice Letter Filing; please review your Advice Letter Filing with the information contained in the AL status certificate, and update your Advice Letter and tariff records accordingly.

All inquiries to the California Public Utilities Commission on the status of your Advice Letter Filing will be answered by Energy Division staff based on the information contained in the Energy Division's PAL database from which the AL status certificate is generated. If you have any questions on this matter please contact the:

Energy Division's Tariff Unit by e-mail to
edtariffunit@cpuc.ca.gov



Sidney Bob Dietz II
Director
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May 6, 2022

Advice 4571-G-A/6497-E-A
(Pacific Gas and Electric Company ID U 39 M)

Public Utilities Commission of the State of California

Subject: Supplemental: Net Electric and Gas Bill Impact Study for Residential Customers Who Switch from Natural Gas Water Heater to Electric Heat Pump Water Heater in Compliance with D.21-11-002

Purpose

The purpose of this supplemental advice letter is to present the results of Pacific Gas and Electric's (PG&E) Supplemental Study to provide additional information requested by Energy Division on March 29, 2022. Specifically, Energy Division requested analysis of the net electric and gas bill impacts resulting from customers with average electric and gas usage switching from a natural gas water heater to an electric heat pump water heater (HPWH), assuming they were initially on PG&E's non-TOU rate (Schedule E-1) and remained on that rate after installing their electric HPWH. This supplement also provides the net bill impact results by baseline territory for all territories in which PG&E provides natural gas service.

Background

Pursuant to D.21-11-002, on February 7, 2022, PG&E submitted Advice 4571-G/6497-E, which presented the results of a study (PG&E Study or Study) of the electric and gas net bill impacts resulting from residential customers with average electric and gas usage switching from a natural gas water heater to an electric HPWH. That Study assumed that customers were initially taking service on PG&E's default time-of-use (TOU) rate, Schedule E-TOU-C, when they replaced their gas water heater with the HPWH. They were then assumed to either (a) switch to PG&E's recently-approved pro-electrification rate with a \$15 fixed charge (Schedule E-ELEC), or (b) remain on Schedule E-TOU-C, depending on which rate option yielded the lowest annual electric bill. In this supplemental advice letter, PG&E provides additional information requested by Energy Division staff in the attached supplemental net bill impact study, titled "Pacific Gas and Electric's Supplemental Study of Net Bill Impacts for Residential Customers Who Switch from a Natural Gas Water Heater to an Electric Heat Pump Water Heater Based on Non-TOU Rates" (PG&E Supplemental Study or Supplemental Study), shown in Attachment 1.

In this Supplemental Study, per Energy Division staff's request on March 29, PG&E has modified its analysis in two ways. First, PG&E has assumed that, prior to installing the HPWH, the average customers were taking service on PG&E's tiered rate plan, Schedule E-1 (rather than on Schedule E-TOU-C, as PG&E's Study assumed). Second, PG&E has assumed that, post-installation, customers remained on Schedule E-1 (rather than assuming they would select a TOU rate option even though it might have resulted in a lower electric bill). By precluding customers from taking advantage of potential opportunities for lower electric bills by selecting a TOU rate, this analysis attempts to model a situation where customers might be so "TOU-averse" due to bill uncertainty concerns from the need to manage the time pattern of their loads, that they remain on E-1 even if they could have obtained a lower electric bill on a TOU rate. PG&E also provides the results from a related additional analysis (not requested by Energy Division staff) that relaxes the assumption that all the average customers would remain on Schedule E-1 post-installation, and also updates the gas and electric rates to better reflect PG&E's current rates.¹

Conclusion

PG&E's Supplemental Study shows that, on average, customers who switch from a gas water heater to a typical industry-prevalent HPWH are likely to see a net bill savings by taking service on PG&E's new pro-electrification rate, Schedule E-ELEC. Even if an E-1 customer were so TOU-averse as to choose to remain on the tiered Schedule E-1 rate after switching to a HPWH, an average E-1 customer can still achieve net bill savings by adopting a more efficient HPWH model and set it to operate at a lower tank temperature. The only exception to this conclusion is for the average customer in Territory Y, where the population is less than one percent of total PG&E's customer population. In addition, in the long run the net bill savings from moving to an HPWH in PG&E's service territory are expected to grow over time, especially as higher efficiency HPWH models become more dominant in this emerging market and as increases in gas rates continue to outpace electric rates as electrification progresses.

Protests

Anyone wishing to protest this submittal may do so by letter sent electronically via E-mail, no later than May 26, 2022, which is 20 days after the date of this submittal. Protests must be submitted to:

CPUC Energy Division
ED Tariff Unit
E-mail: EDTariffUnit@cpuc.ca.gov

¹ PG&E's initial Study utilized rates from 2020.

The protest shall also be electronically sent to PG&E via E-mail at the address shown below on the same date it is electronically delivered to the Commission:

Sidney Bob Dietz II
Director, Regulatory Relations
c/o Megan Lawson
E-mail: PGETariffs@pge.com

Any person (including individuals, groups, or organizations) may protest or respond to an advice letter (General Order 96-B, Section 7.4). The protest shall contain the following information: specification of the advice letter protested; grounds for the protest; supporting factual information or legal argument; name and e-mail address of the protestant; and statement that the protest was sent to the utility no later than the day on which the protest was submitted to the reviewing Industry Division (General Order 96-B, Section 3.11).

Effective Date

Pursuant to General Order (GO) 96-B, Rule 5.3, and OP 4 of D.21.11.002, this advice letter is submitted with a Tier 3 designation. PG&E requests that this Tier 3 advice submittal become effective upon Commission approval.

Notice

In accordance with General Order 96-B, Section IV, a copy of this advice letter is being sent electronically to parties shown on the attached list and the parties on the service list for R-19.01.011. Address changes to the General Order 96-B service list should be directed to PG&E at email address PGETariffs@pge.com. For changes to any other service list, please contact the Commission's Process Office at (415) 703-2021 or at Process_Office@cpuc.ca.gov. Send all electronic approvals to PGETariffs@pge.com. Advice letter submittals can also be accessed electronically at: <http://www.pge.com/tariffs/>.

/S/

Sidney Bob Dietz II
Director, Regulatory Relations

Attachments

cc: Service List R-19.01.011



ADVICE LETTER SUMMARY

ENERGY UTILITY



MUST BE COMPLETED BY UTILITY (Attach additional pages as needed)

Company name/CPUC Utility No.: Pacific Gas and Electric Company (ID U39 M)

Utility type:

ELC GAS WATER
 PLC HEAT

Contact Person: Annie Ho
Phone #: (415) 973-8794
E-mail: PGETariffs@pge.com
E-mail Disposition Notice to: AMHP@pge.com

EXPLANATION OF UTILITY TYPE

ELC = Electric GAS = Gas WATER = Water
PLC = Pipeline HEAT = Heat

(Date Submitted / Received Stamp by CPUC)

Advice Letter (AL) #: 4571-G-A/6497-E-A

Tier Designation: 3

Subject of AL: Supplemental: Net Electric and Gas Bill Impact Study for Residential Customers Who Switch from Natural Gas Water Heater to Heat Pump Water Heater in Compliance with D.21-11-002

Keywords (choose from CPUC listing): Compliance

AL Type: Monthly Quarterly Annual One-Time Other:

If AL submitted in compliance with a Commission order, indicate relevant Decision/Resolution #: D.21-11-002

Does AL replace a withdrawn or rejected AL? If so, identify the prior AL:

Summarize differences between the AL and the prior withdrawn or rejected AL:

Confidential treatment requested? Yes No

If yes, specification of confidential information:

Confidential information will be made available to appropriate parties who execute a nondisclosure agreement. Name and contact information to request nondisclosure agreement/ access to confidential information:

Resolution required? Yes No

Requested effective date:

No. of tariff sheets: N/A

Estimated system annual revenue effect (%): N/A

Estimated system average rate effect (%): N/A

When rates are affected by AL, include attachment in AL showing average rate effects on customer classes (residential, small commercial, large C/I, agricultural, lighting).

Tariff schedules affected: N/A

Service affected and changes proposed¹: N/A

Pending advice letters that revise the same tariff sheets: N/A

¹Discuss in AL if more space is needed.

Protests and correspondence regarding this AL are to be sent via email and are due no later than 20 days after the date of this submittal, unless otherwise authorized by the Commission, and shall be sent to:

California Public Utilities Commission
Energy Division Tariff Unit Email:
EDTariffUnit@cpuc.ca.gov

Contact Name: Sidnev Bob Dietz II. c/o Megan Lawson
Title: Director, Regulatory Relations
Utility/Entity Name: Pacific Gas and Electric Company

Telephone (xxx) xxx-xxxx: (415)973-2093
Facsimile (xxx) xxx-xxxx: (415)973-3582
Email: PGETariffs@pge.com

Contact Name:
Title:
Utility/Entity Name:

Telephone (xxx) xxx-xxxx:
Facsimile (xxx) xxx-xxxx:
Email:

CPUC
Energy Division Tariff Unit
505 Van Ness Avenue
San Francisco, CA 94102

Clear Form

Attachment 1

Pacific Gas and Electric's Supplemental Study of Net Bill Impacts for Residential Customers Who Switch from a Natural Gas Water Heater to an Electric Heat Pump Water Heater Based on Non-TOU Rates

1. Introduction

In its submitted Advice 4571-G/6497-E, PG&E presented the results of a study (PG&E Study or Study) of the electric and gas net bill impacts resulting from residential customers with average electric and gas usage switching from a natural gas water heater to an electric heat pump water heater (HPWH). That Study assumed that customers were initially taking service on PG&E's default time-of-use (TOU) rate, Schedule E-TOU-C, when they replaced their gas water heater with the HPWH. They were then assumed to either (a) switch to PG&E's recently-approved pro-electrification rate with a \$15 fixed charge, Schedule E-ELEC, or (b) remain on Schedule E-TOU-C, depending on which rate option yielded the lowest annual electric bill.

In this Supplemental Study, per Energy Division staff's request on March 29, PG&E has modified its analysis in two ways. First, PG&E has assumed that, prior to installing the HPWH, the average customers were taking service on PG&E's tiered rate plan, Schedule E-1 (rather than on Schedule E-TOU-C, as PG&E's Study assumed). Second, PG&E has assumed that, post-installation, customers remained on Schedule E-1 (rather than assuming they would select a TOU rate option even though it might have resulted in a lower electric bill). By precluding customers from taking advantage of potential opportunities for lower electric bills by selecting a TOU rate, this analysis attempts to model a situation where customers might be so "TOU-averse" due to bill uncertainty concerns from the need to manage the time pattern of their loads, that they remain on E-1 even if they could have obtained a lower electric bill on a TOU rate. PG&E also provides the results from a related additional analysis (not requested by Energy Division staff) that relaxes the assumption that all the average customers would remain on Schedule E-1 post-installation, and also updates the gas and electric rates to better reflect PG&E's current (2022) rates.¹

Other than introducing the non-TOU rate to the net bill impact analysis, the Supplemental Study used the same method to calculate net bill impacts as well as consistent usage profiles² as those used in PG&E's initial Study. Once a customer switches from a gas water heater to a HPWH, the savings on their gas bill could offset their electric bill increase and the net bill impact is the resulting change in the total gas and electric bill amount. Additionally, per another Energy Division staff request made on March 29, 2022, the Supplemental Study provides more detailed net bill impact results for all PG&E baseline territories in which PG&E also provides gas service³ (rather than for just the three representative baseline territories shown in the initial Study).

¹ PG&E's initial Study utilized rates from 2020.

² Some master-metered customers kWh usage was included in the filed Advice Letter in February 2022. The result in this Supplemental Study excluded those usage. The average kwh usage by baseline territory has immaterial changes. The direction of the overall results shown in the filed Advice Letter stay the same.

³ Among PG&E's 10 Baseline Territories, Territory Z does not have PG&E's gas services, and thus was excluded from this Supplemental Study.

2. Net Bill Impact for Basic Use Customers Based on Schedule E-1

In this section, PG&E presents the requested net bill impacts for Basic Use (Basic) customers. Basic customers are those who have both gas and electric services, and their permanent space heating source is gas. The majority of PG&E's residential customers are Basic customers, with the remainder being All-Electric Use (All-Electric) customers.

On the electric side, the Schedule E-1 rate was applied to both the initial electric household usage *without* a HPWH and the electric household usage *with* a HPWH. Since the new assumptions used in this Supplemental Study only affect the electric bill calculations, the gas bill reductions are the same as presented in PG&E's initial Study. This section covers the following scenarios:

1. The net bill impact after switching from an average 50-gallon gas water heater to an average 50-gallon HPWH (Table 2-1)
2. The net bill impact after switching from an average 50-gallon gas water heater to an average 80-gallon HPWH (Table 2-2)
3. By baseline territory, the non-CARE net bill impact after switching from an average 50-gallon gas water heater to a 50-gallon HPWH, with 3.70 UEF and 120°F Tank Temperature. (Table 2-3)
4. By baseline territory, the CARE net bill impact after switching from an average 50-gallon gas water heater to a 50-gallon HPWH, with 3.55 UEF and 125°F Tank Temperature. (Table 2-4)

Although the switch to an average HPWH⁴ (with a UEF of slightly lower than 3.5) and operating it at an average temperature (around 130°F Tank Temperature⁵) may result in a net bill increase under the E-1 rates as indicated in Table 2-1 and Table 2-2 below, such E-1 customers can still achieve net bill savings by adopting a more efficient HPWH model and setting it to operate at a slightly lower Tank Temperature of 125°F or 120°F, as shown in Table 2-3 and Table 2-4.

Table 2-1 shows the results for the average non-CARE and CARE Basic customers switching from a 50-gallon gas water heater to a 50-gallon HPWH. The customers with average usage are estimated to see *annual net bill increase* on their combined gas and electric bills when they switch from gas water heater to HPWH.

⁴ As noted in the filed Study, for each HPWH tank size, there are electric usage profiles for each of: (1) the nine CEC climate zones, (2) the five tank temperature settings (120°F, 125°F, 130°F, 135°F and 140°F), and (3) the three available UEF values. Permutations of each of these three variables result in 135 (9 times 5 times 3) usage profiles. PG&E combined these 135 usage profiles into a single average usage profile by: (a) first averaging the profiles over the 15 temperature/UEF combinations, and then (b) taking a weighted average over the nine CEC climate zones (using the number of customers in each zone as weights).

⁵ The average tank temperature of about 130°F is comparable to the 2019 California Residential Appliance Saturation Study (RASS) result. The survey contains a question (D3) asking about current water heater temperature with 3 choices: Low (below 130°F), Medium (130°F -150°F), and High (over 150°F). The result shows that the majority (74%) responded with MEDIUM (130 -150°F).

Table 2-1

**Basic Use Customers' Net Bill Impact Based on E-1
Switching from 50-Gallon Gas Water Heater to 50-Gallon HPWH**

Gas	Non-CARE	CARE
Gas Rate Schedule	G1	G1L
Gas Annual Usage	462	394
Gas Bill	\$761	\$495
Gas Water Heater Usage Saved	175	175
Gas Bill (w/o Water Heater)	\$443	\$264
Gas Bill Saving	\$318	\$231
Electric	Non-CARE	CARE
Electric Rate Schedule (Before)	E-1	E-1-L
Electric Rate Schedule (After)	E-1	E-1-L
Electric Annual Usage (Before)	6130	6546
Electric Bill (Before)	\$1,640	\$1,134
HPWH Usage	1320	1320
Electric Bill (add HPWH)	\$2,045	\$1,397
Electric Bill Increase	\$405	\$263
Annual Net Bill Impact	\$87	\$32

As mentioned in the prior PG&E Study filed in February, customers who would like to match the first hour rating (FHR) of their previous water heater, may choose a larger 80-gallon tank size HPWH (if they have the space to do so).⁶ Based on the DEER Water Heater Calculator, an 80-gallon HPWH uses slightly *less* energy than would a 50-gallon HPWH, therefore the annual electric bill increase is slightly less than the 50-gallon to 50-gallon switch. See Table 2-2.

⁶ As noted in the filed Study, an HPWH generally needs more time to heat up cold water than an equivalent-sized gas water heater, the First Hour Rating (FHR) for the HPWH will likely be lower than the customer was accustomed to experiencing with the gas water heater being replaced. Thus, to adhere to California Plumbing Code Section 501, such customers would most likely need to upsize their HPWH to meet the minimum FHR and match that of their previous water heater. Such a customer may choose a *larger 80-gallon* HPWH (if they have the space to do so), to achieve a similar First Hour Rating (FHR) when they replace their existing *50-gallon* gas water heater. Also, per the DEER Water Heater Calculator, an 80-gallon HPWH uses slightly *less* energy than would a 50-gallon HPWH (likely due to the lower number of times the larger unit uses its backup electric resistance heater, as compared with higher number of times the back-up electric resistance heater is used by a smaller, 50-gallon tank HPWH).

Table 2-2

**Basic Use Customers' Net Bill Impact Based on E-1
Switching from 50-Gallon Gas Water Heater to 80-Gallon HPWH**

Gas	Non-CARE	CARE
Gas Rate Schedule	G1	G1L
Gas Annual Usage	462	394
Gas Bill	\$761	\$495
Gas Water Heater Usage Saved	175	175
Gas Bill (w/o Water Heater)	\$443	\$264
Gas Bill Saving	\$318	\$231
Electric	Non-CARE	CARE
Starting Electric Rate Schedule	E-1	E-1-L
Electric Rate Schedule (After)	E-1	E-1-L
Annual Usage (Before)	6130	6546
Electric Bill (Before)	\$1,640	\$1,134
HPWH Usage	1298	1298
Electric Bill (add HPWH)	\$2,038	\$1,393
Electric Bill Increase	\$398	\$259
Annual Net Bill Impact	\$80	\$28

Since the 80-gallon scenario has better net bill impact result than the 50-gallon HPWH scenario due to less electric usage by HPWH, the rest of the Supplemental Study focuses more on the 50-gallon HPWH. So long as the 50-gallon HPWH scenario reaches net bill savings, the 80-gallon scenario will reach net bill savings too, holding other factors constant.

Tables 2-3 and Table 2-4 present the net bill savings for non-CARE and CARE customers by baseline territory, as requested by Energy Division. To ensure most of the baseline territories have average customers with net bill savings, the HPWH adopted needs to be more efficient and the tank temperature setting needs to be set lower than the average 130°F.

Table 2-3 shows that, except for Territory Y, non-CARE customers in all other baseline territories with average usage would expect to see net bill savings when they switch from a gas water heater to a HPWH with 3.7 UEF and a tank temperature setting of 120°F.⁷

⁷ The 120°F tank temperature is the recommended setting by the Department of Energy's Energy Saver website. The 120°F was also found to be the temperature setting at which the HPWH is shipped, in several HPWH manufacturer's installation guides. The manufacturers provide instructions on how to change the temperature once it's installed along with information about the dangers of setting it higher.

Table 2-3

**Basic Use Non-CARE Customers' Net Bill Impact Based on E-1
Switching to 50-Gallon HPWH with 3.7 UEF and 120°F Tank Temperature**

<i>Basic Use</i>	P	Q	R	S	T	V	W	X	Y
Gas	Non-CARE	Non-CARE							
Gas Rate Schedule	G1	G1							
Gas Annual Usage	555	579	427	437	457	492	396	490	639
Gas Bill	\$938	\$981	\$714	\$723	\$744	\$807	\$654	\$807	\$1,050
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$607	\$639	\$411	\$412	\$421	\$451	\$361	\$487	\$687
Gas Bill Saving	\$330	\$342	\$303	\$312	\$323	\$356	\$293	\$320	\$363
Electric	Non-CARE	Non-CARE							
Starting Electric Rate Schedule	E-1	E-1							
Electric Rate Schedule (After)	E-1	E-1							
Annual Usage (Before)	7139	6410	7989	7884	4215	5475	8063	6306	5436
Electric Bill (Before)	\$1,897	\$1,703	\$2,135	\$2,127	\$1,115	\$1,487	\$2,154	\$1,694	\$1,398
HPWH Usage	871	949	807	871	949	1117	807	893	1375
Electric Bill (add HPWH)	\$2,164	\$1,994	\$2,382	\$2,394	\$1,406	\$1,830	\$2,402	\$1,968	\$1,820
Electric Bill Increase	\$267	\$291	\$247	\$267	\$291	\$343	\$247	\$274	\$422
Annual Net Bill Impact	-\$63	-\$51	-\$55	-\$45	-\$32	-\$13	-\$45	-\$46	\$59

CARE customers in general find it easier than non-CARE customers to achieve net bill savings because the CARE discount on gas rates is 20% whereas CARE discount on electric rates is significantly greater, at about 35%. Table 2-4 shows the results for average CARE customers in all baseline territories in which PG&E provides gas service. By switching to a slightly more efficient HPWH (3.55 UEF or above), with a 125°F tank temperature setting, the average CARE customer would expect to see a net bill decrease in all baseline territories except Territory Y (which contains about 4,400 CARE customers, just 0.4% of the total CARE customer population).

**Table 2-4
Basic Use CARE Customers' Net Bill Impact Based on E-1
Switching to 50-Gallon HPWH with 3.55 UEF and 125°F Tank Temperature**

<i>Basic</i>	P	Q	R	S	T	V	W	X	Y
Gas	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Gas Rate Schedule	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L
Gas Annual Usage	433	543	380	397	393	457	384	396	553
Gas Bill	\$544	\$713	\$485	\$504	\$489	\$577	\$494	\$493	\$691
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$320	\$447	\$264	\$274	\$251	\$309	\$267	\$267	\$432
Gas Bill Saving	\$224	\$266	\$221	\$230	\$238	\$267	\$227	\$226	\$259
Electric	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Starting Electric Rate Schedule	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L
Electric Rate Schedule (After)	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L	E-1-L
Annual Usage (Before)	7552	6418	7999	7705	4147	4828	8029	5671	6879
Electric Bill (Before)	\$1,316	\$1,110	\$1,390	\$1,348	\$712	\$838	\$1,394	\$975	\$1,197
HPWH Usage	1051	1140	977	1051	1140	1334	977	1075	1591
Electric Bill (add HPWH)	\$1,526	\$1,337	\$1,585	\$1,558	\$939	\$1,104	\$1,589	\$1,190	\$1,514
Electric Bill Increase	\$210	\$228	\$195	\$210	\$228	\$266	\$195	\$214	\$317
Annual Net Bill Impact	-\$14	-\$38	-\$26	-\$20	-\$10	-\$1	-\$32	-\$12	\$58

3. Net Bill Impact for All-Electric Baseline Customers Based on Schedule E-1

As noted in PG&E's initial Study, when evaluating the results for All-Electric⁸ customers, it is appropriate to look only at the subset of All-Electric customers who also take PG&E's natural gas service, because only those customers would have a gas water heater from which to switch to HPWH. This group is composed of about 150,000 customers. By applying the Schedule E-1 rate to both household usage before and after the switch, a customer with average usage would be expected to see net bill increase, as shown in Table 3-1.

⁸ All-electric baseline quantities are applicable to service to customers with permanently installed electric heating as the primary heat source.

Table 3-1

All-Electric Use Customers' Net Bill Impact Based on E-1 Switching from 50-Gallon Gas Water Heater to 50-Gallon HPWH

Gas	Non-CARE	CARE
Gas Rate Schedule	G1	G1L
Gas Annual Usage	340	312
Gas Bill	\$534	\$386
Gas Water Heater Usage Saved	175	175
Gas Bill (w/o Water Heater)	\$253	\$164
Gas Bill Saving	\$281	\$221
Electric	Non-CARE	CARE
Starting Electric Rate Schedule	E-1	E-1-L
Electric Rate Schedule (After)	E-1	E-1-L
Annual Usage (Before)	6284	7344
Electric Bill (Before)	\$1,596	\$1,209
HPWH Usage	1320	1320
Electric Bill (add HPWH)	\$1,990	\$1,461
Electric Bill Increase	\$394	\$252
Annual Net Bill Impact	\$113	\$30

However, if these customers can adopt a more efficient HPWH model (3.70 UEF or above) and set it to operate at a 120°F tank temperature setting, even this subset of All-Electric customers can see net bill savings, as shown in Table 3-2.

Table 3-2

All-Electric Use Customers' Net Bill Impact Based on E-1 Switching to 50-Gallon HPWH with 3.70 UEF and 120°F Tank Temperature

Gas	Non-CARE	CARE
Gas Rate Schedule	G1	G1L
Gas Annual Usage	340	312
Gas Bill	\$534	\$386
Gas Water Heater Usage Saved	175	175
Gas Bill (w/o Water Heater)	\$253	\$164
Gas Bill Saving	\$281	\$221
Electric	Non-CARE	CARE
Starting Electric Rate Schedule	E-1	E-1-L
Electric Rate Schedule (After)	E-1	E-1-L
Annual Usage (Before)	6284	7344
Electric Bill (Before)	\$1,596	\$1,209
HPWH Usage	903	903
Electric Bill (add HPWH)	\$1,862	\$1,380

Electric Bill Increase	\$266	\$170
Annual Net Bill Impact	-\$15	-\$51

PG&E also tested the UEF and the tank temperature setting needed for most of the baseline territories' non-CARE All-Electric customers to achieve bill savings. Table 3-3 shows the result of net bill impact by baseline territory for these customers with average usage given a HPWH with 3.70 UEF and 120°F tank temperature.

Table 3-3

All-Electric Non-CARE Customers' Net Bill Impact Based on E-1 Switching to 50-Gallon HPWH with 3.70 UEF and 120°F Tank Temperature

<i>All-Electric</i>	P	Q	R	S	T	V	W	X	Y
Gas	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Gas Rate Schedule	G1	G1	G1	G1	G1	G1	G1	G1	G1
Gas Annual Usage	536	553	349	343	352	529	349	314	664
Gas Bill	\$898	\$927	\$557	\$541	\$547	\$882	\$560	\$488	\$1,104
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$572	\$588	\$290	\$265	\$259	\$512	\$287	\$213	\$737
Gas Bill Saving	\$326	\$339	\$267	\$276	\$288	\$371	\$273	\$276	\$367
Electric	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Starting Electric Rate Schedule	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1
Electric Rate Schedule (After)	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1
Annual Usage (Before)	6875	6882	7869	7304	4150	7230	8268	5668	8397
Electric Bill (Before)	\$1,718	\$1,735	\$1,982	\$1,832	\$1,031	\$1,875	\$2,096	\$1,445	\$2,136
HPWH Usage	871	949	807	871	949	1117	807	893	1375
Electric Bill (add HPWH)	\$1,943	\$1,983	\$2,189	\$2,057	\$1,303	\$2,218	\$2,314	\$1,708	\$2,521
Electric Bill Increase	\$225	\$247	\$207	\$225	\$272	\$343	\$218	\$264	\$384
Annual Net Bill Impact	-\$101	-\$92	-\$60	-\$51	-\$16	-\$28	-\$55	-\$12	\$17

Table 3-4 shows the net bill impacts for CARE All-Electric customers, assuming, a HPWH with a 3.70 UEF and 125°F tank temperature.⁹ As both tables show, net bill savings can be achieved by customers with average usage in all territories except for Territory Y (where there is a small net bill increase).

⁹ As noted in Section 3, CARE customers find it easier than non-CARE customers to achieve net bill savings due to the higher electric (vs. gas) CARE discounts. Thus, unlike the average non-CARE customer, the average CARE customer installing a HPWH with a UEF of 3.70 does not need to set its tank temperature at 120°F to achieve net bill savings.

Table 3-4

All-Electric CARE Customers' Net Bill Impact Based on E-1 Switching to 50-Gallon HPWH with 3.70 UEF and 125°F Tank Temperature

<i>All-Electric</i>	P	Q	R	S	T	V	W	X	Y
Gas	CARE	CARE							
Gas Rate Schedule	G1L	G1L							
Gas Annual Usage	492	565	315	286	325	481	363	288	626
Gas Bill	\$636	\$751	\$394	\$354	\$396	\$616	\$462	\$352	\$805
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$394	\$484	\$186	\$139	\$169	\$340	\$241	\$135	\$525
Gas Bill Saving	\$242	\$267	\$208	\$215	\$227	\$277	\$221	\$217	\$280
Electric	CARE	CARE							
Starting Electric Rate Schedule	E-1-L	E-1-L							
Electric Rate Schedule (After)	E-1-L	E-1-L							
Annual Usage (Before)	7405	6500	7838	7113	4153	6669	9147	5452	8206
Electric Bill (Before)	\$1,206	\$1,059	\$1,285	\$1,159	\$672	\$1,108	\$1,530	\$900	\$1,353
HPWH Usage	1006	1092	936	1006	1092	1277	936	1029	1541
Electric Bill (add HPWH)	\$1,375	\$1,244	\$1,441	\$1,328	\$876	\$1,363	\$1,699	\$1,095	\$1,636
Electric Bill Increase	\$169	\$186	\$156	\$169	\$204	\$255	\$168	\$195	\$283
Annual Net Bill Impact	-\$73	-\$81	-\$52	-\$46	-\$23	-\$22	-\$52	-\$22	\$3

4. Adding Schedule E-ELEC as a Customer Option and Updating Gas and Electric Rates to Current Levels

In both Sections 2 and 3, the analyses assume, consistent with Energy Division staff's request, that customers who are currently on the Schedule E-1 rate remain on Schedule E-1 after they replace their gas water heater with a HPWH. However, once a customer installs a HPWH, she now will have the option to choose PG&E's new electrification rate, Schedule E-ELEC electrification rate, which would likely provide lower electric bills than if they remain on Schedule E-1.¹⁰ So PG&E conducted an additional analysis to see how net bill impacts changed if customers were assumed to choose E-ELEC instead of E-1 if doing so provided them with a lower bill.

In addition, the net bill impacts presented in Sections 2 and 3 are based on 2020 rates, so that the results are on a comparable basis to the ones in PG&E's initial February 2022 Study. Since 2020, though, there have been several major changes in PG&E's rates that would influence the net bill impacts. First, natural gas prices have gone up significantly since the fourth quarter of 2021 and have continued into 2022.¹¹ While

¹⁰ They would also have the option to select Schedule EV2, which was initially designed primarily for customers with electric vehicle charging but will soon be open to customers with HPWH units.

¹¹ In April 2022, PG&E posted its most recent gas rate forecast on its website at <https://www.pge.com/tariffs/Residential.pdf>

residential electric rates have also increased significantly since 2020, their percentage increase has been lower than that of gas rates, so the economics of replacing gas water heaters with HPWH units have become more attractive. Second, on March 18, 2022, the Commission issued a final decision regarding the marginal generation capacity cost (MGCC) tax adder calculation provided by PG&E as part of its 2020 GRC Phase II proceeding, which has the effect of making the summer and winter E-ELEC rates further apart -- with winter rates becoming lower and summer rates higher. Because HPWHs generally use more kWh in winter, this change has the effect of making E-ELEC even more attractive for customers replacing their gas water heaters with a HPWH.

To reflect these rate changes, in this section, PG&E presents updated net bill comparisons based on current 2022 rates¹² and assuming that customers who replace their gas water heater with a HPWH would also switch from E-1 to E-ELEC if doing so reduces their electric bills. Table 4-1 shows the results for Basic non-CARE customers who start with the non-TOU rate Schedule E-1 and select the electrification rate Schedule E-ELEC after adopting HPWH. For all Baseline Territories except Territory Y, the net bill impact is negative, when customers adopt a moderately efficient HPWH (3.5 UEF or above) with a tank temperature of 125°F. Similar results are displayed in Table 4-2 for All-Electric non-CARE average customers in all baseline territories, when customers adopt a slightly more efficient HPWH (3.55 UEF or above) with a tank temperature of 125°F. Since CARE customers in general find it easier than non-CARE customers to achieve net bill savings, given the same UEF and tank temperature settings, they are expected to see net bill savings as well.

¹² The 2022 gas rates include 4-month actual rates and a forecast of procurement cost and certain proceedings that are anticipated to be implemented in the rest of 2022 after a final decision is issued.

Table 4-1

**Basic Use Non-CARE Customers Net Bill Impact Based on 2022 Rates
Switching to 50-Gallon HPWH with 3.50 UEF & 125°F Tank Temperature**

<i>Basic</i>	P	Q	R	S	T	V	W	X	Y
Gas	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Gas Rate Schedule	G1	G1	G1	G1	G1	G1	G1	G1	G1
Gas Annual Usage	555	579	427	437	457	492	396	490	639
Gas Bill	\$1,247	\$1,302	\$953	\$969	\$998	\$1,080	\$876	\$1,080	\$1,408
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$832	\$869	\$569	\$570	\$581	\$623	\$500	\$672	\$945
Gas Bill Saving	\$415	\$433	\$384	\$399	\$417	\$457	\$376	\$409	\$463
Electric	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Starting Electric Rate Schedule	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1
Electric Rate (After, Optimal)	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC
Annual Usage (Before)	7139	6410	7989	7884	4215	5475	8063	6306	5436
Electric Bill (Before)	\$2,445	\$2,196	\$2,751	\$2,741	\$1,437	\$1,916	\$2,777	\$2,184	\$1,803
HPWH Usage	1067	1158	992	1067	1158	1354	992	1091	1608
Electric Bill (add HPWH)	\$2,736	\$2,427	\$3,059	\$3,031	\$1,782	\$2,199	\$3,114	\$2,450	\$2,295
Electric Bill Increase	\$291	\$232	\$308	\$290	\$344	\$283	\$337	\$266	\$492
Annual Net Bill Impact	-\$124	-\$201	-\$77	-\$109	-\$73	-\$175	-\$38	-\$142	\$29

Table 4-2

All-Electric Non-CARE Customers' Net Bill Impact Based on 2022 Rates Switching to 50-Gallon HPWH with 3.55 UEF & 125°F Tank Temperature

<i>All-Electric</i>	P	Q	R	S	T	V	W	X	Y
Gas	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Gas Rate Schedule	G1	G1	G1	G1	G1	G1	G1	G1	G1
Gas Annual Usage	536	553	349	343	352	529	349	314	664
Gas Bill	\$1,197	\$1,234	\$756	\$737	\$744	\$1,174	\$758	\$665	\$1,477
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$786	\$804	\$402	\$368	\$357	\$704	\$400	\$294	\$1,010
Gas Bill Saving	\$411	\$431	\$354	\$369	\$387	\$470	\$358	\$371	\$466
Electric	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Starting Electric Rate Schedule	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1	E-1
Electric Rate (After, Optimal)	ETOU-C	E-ELEC	E-1	E-1	ETOU-C	E-ELEC	E-1	E-ELEC	E-ELEC
Annual Usage (Before)	6875	6882	7869	7304	4150	7230	8268	5668	8397
Electric Bill (Before)	\$2,216	\$2,239	\$2,557	\$2,364	\$1,331	\$2,418	\$2,704	\$1,864	\$2,756
HPWH Usage	1051	1140	977	1051	1140	1334	977	1075	1591
Electric Bill (add HPWH)	\$2,553	\$2,567	\$2,881	\$2,715	\$1,715	\$2,707	\$3,047	\$2,221	\$3,178
Electric Bill Increase	\$337	\$328	\$324	\$350	\$384	\$289	\$342	\$357	\$422
Annual Net Bill Impact	-\$74	-\$102	-\$30	-\$18	-\$3	-\$181	-\$16	-\$14	-\$44

The results presented in this section, as well as in Sections 2 and 3, were all predicated on the assumption that, prior to installation of the HPWH, the average customer was taking service on Schedule E-1 rather than on the now-current default rate, Schedule E-TOU-C (as PG&E's initial Study did). PG&E agrees that it is worthwhile to study the net bill impacts under this particular assumption since significant number of customers still take service on E-1 even after the default transition has been completed. However, PG&E believes more weight should be attributed to the results from its initial Study which assumed both that customers were initially on Schedule E-TOU-C and (b) that, post-installation of the HPWH, customers could (and should) select a TOU rate if that rate provided a lower electric bill than E-1, consistent with the CPUC's pro-TOU policy enumerated in D. 15-07-001.¹³

Pursuant to the California Public Utilities Commission's (CPUC or Commission) Decision (D.)19-07-004, PG&E just recently concluded its final wave of defaulting eligible residential customers from its tiered Schedule E-1 rate to the default TOU rate, Schedule E-TOU-C.¹⁴ However, not every E-1 customer was part of the TOU default transition, because Ordering Paragraph 27 of that decision eventually resulted in a significant

¹³ See D.15-07-001, Findings of Fact 42, 47, 100, 134 and 135.

¹⁴ PG&E's TOU default transition was conducted in multiple waves between October 2020 and April 2022.

number of E-1 customers (about two million) being excluded.¹⁵ After making these exclusions, about 2.1 million E-1 customers were part of PG&E's default TOU transition efforts. Customer choice outcomes from those eligible for the default TOU transition were as follows:

- Did not opt out, chose E-TOU-C = 1.6 million (76%);
- Opted out of E-TOU-C, chose a different optional TOU rate¹⁶ = 0.1 million (5%);
- Opted out of E-TOU-C, chose to remain on E-1 = 0.4 million (19%).

So, after this group of 2.1 million residential customers had (a) first been educated about TOU rates and then (b) presented with a choice between moving to a TOU rate or remaining on Schedule E-1, a whopping 81 percent selected a TOU rate (either the default E-TOU-C rate or a different optional TOU rate), while just 19 percent remained on E-1.¹⁷ While the promise of a year of bill protection undoubtedly had some influence on customers' receptivity to TOU rates, this is still evidence that the CPUC's pro-TOU policy will continue to result in additional adoption of TOU rates in the future. Consequently, PG&E believes the Commission should not too heavily weigh results that are predicated on the assumptions that E1 is the starting point rate. Today, post-transition, E-1 customers are now the minority compared to those taking service on TOU rates. And this is the case despite the fact that large numbers of E-1 customers were excluded from the initial transition. A large segment of the excluded group consists of customers who did not then have 12 months of billing data as well as low-income customers who live in hot climate zones (due to the concerns about their potential to receive higher electric bills under TOU rates). However, as PG&E's analysis has showed, these very customers in hot climate zones may benefit from new TOU rate options like Schedule E-ELEC (with its fixed charge and lower volumetric rates) that were not available when D.15-07-001 was issued. PG&E believes communications with such customers should take place before automatically assuming they are TOU-averse (since many were never transitioned in the first place). This will best support pro-electrification policy and customer affordability. In addition, the Commission should give lesser weight to the Section 2 and 3 results which were based on a restrictive assumption that customers installing HPWH would not select a TOU rate, even if that rate gave them lower electric bills.

5. Update of Initial Study Results to Show Net Bill Impacts for all Baseline Territories

¹⁵ Customers were excluded from the transition for any of the following reasons: (1) they did not have twelve months of interval usage data before notifications were sent; (2) they were CARE/FERA enrolled or eligible in hot climate zones; (3) they were master-metered; (4) they had opted out or unenrolled from the prior TOU pilot; (5) they had received a medical baseline allowance; (6) they had requested third-party notification; or (7) they were in the group of customers the Commission had ordered could not be disconnected without an in-person visit from a utility representative.

¹⁶ PG&E's other optional TOU rates include Schedules E-TOU-D, EV and EV2.

¹⁷ Prior to the transition, just 15% of residential customers were on TOU rates. With the completion of the TOU default transition, the majority of PG&E's residential customers now take service on TOU rates (including the default Schedule E-TOU-C rate, as well as other optional TOU rate schedules, with a minority remaining on tiered rates.

To make the result more comparable to the filed Study, PG&E used the 2020 rates throughout this section. In its filed Study, PG&E assumed that customers were initially on Schedule E-TOU-C prior to installing their HPWH, and then chose the TOU rate (either E-TOU-C or E-ELEC) that provided the lowest electric bill. That Study, though, only showed net bill impact results for three major baseline territories. In this section, at the request of Energy Division staff, PG&E updates its Study to provide net bill impact result for all baseline territories that have PG&E's gas service. Among the ten baseline territories, Territory Z does not have PG&E's gas services, therefore, is excluded. Like the initial Study, the net bill comparisons in this section are based on PG&E's 2020 rates.¹⁸

Tables 5-1 and 5-2 provide the additional geographical detail requested by Energy Division staff. As the two tables show, the average usage customers in almost every climate zone can achieve net bill savings by adopting PG&E's E-ELEC rate schedule, with the only exceptions being the coastal and the high elevation areas, Territories T and Y (although the average CARE customer in Y could save). But even in these two areas, with a slightly more efficient HPWH (3.55 UEF) operated at a 125°F tank temperature, customers in Territory T (the far more populous of the two) start to achieve net bill savings. See Table 5-3 and Table 5-4 below.

Table 5-1

**Basic Use Non-CARE Net Bill Impact Based on TOU Rates
Switching from 50-Gallon Gas Water Heater to 50-Gallon HPWH**

<i>Basic</i>	P	Q	R	S	T	V	W	X	Y
Gas	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Gas Rate Schedule	G1	G1	G1	G1	G1	G1	G1	G1	G1
Gas Annual Usage	555	579	427	437	457	492	396	490	639
Gas Bill	\$938	\$981	\$714	\$723	\$744	\$807	\$654	\$807	\$1,050
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$607	\$639	\$411	\$412	\$421	\$451	\$361	\$487	\$687
Gas Bill Saving	\$330	\$342	\$303	\$312	\$323	\$356	\$293	\$320	\$363
Electric	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE	Non-CARE
Electric Rate Schedule (Before)	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C
Electric Rate Schedule (After, Optimal)	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC	E-ELEC
Electric Annual Usage (Before)	7139	6410	7989	7884	4215	5475	8063	6306	5436
Electric Bill (Before)	\$1,958	\$1,702	\$2,246	\$2,234	\$1,118	\$1,498	\$2,284	\$1,738	\$1,402
HPWH Usage	1279	1383	1194	1279	1383	1607	1194	1305	1855
Electric Bill (add HPWH)	\$2,239	\$2,008	\$2,485	\$2,470	\$1,495	\$1,829	\$2,524	\$2,019	\$1,904
Electric Bill Increase	\$281	\$305	\$238	\$236	\$377	\$331	\$241	\$281	\$503
Annual Net Bill Impact	-\$49	-\$37	-\$64	-\$76	\$55	-\$25	-\$52	-\$39	\$140

¹⁸ In its initial Study, PG&E provided net bill impacts for Territories W, X and T. The results for those territories are also included here. However, for the reasons described in footnote 2, they differ very slightly from the results in the initial Study due to immaterial updates of average usage in these three areas.

Table 5-2

**Basic Use CARE Net Bill Impact Based on TOU Rates
Switching from 50-Gallon Gas Water Heater to 50-Gallon HPWH**

<i>Basic</i>	P	Q	R	S	T	V	W	X	Y
Gas	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Gas Rate Schedule	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L
Gas Annual Usage	433	543	380	397	393	457	384	396	553
Gas Bill	\$544	\$713	\$485	\$504	\$489	\$577	\$494	\$493	\$691
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$320	\$447	\$264	\$274	\$251	\$309	\$267	\$267	\$432
Gas Bill Saving	\$224	\$266	\$221	\$230	\$238	\$267	\$227	\$226	\$259
Electric	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Electric Rate Schedule (Before)	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L
Electric Rate Schedule (After, Optimal)	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L
Electric Annual Usage (Before)	7552	6418	7999	7705	4147	4828	8029	5671	6879
Electric Bill (Before)	\$1,355	\$1,106	\$1,470	\$1,418	\$713	\$839	\$1,481	\$992	\$1,212
HPWH Usage	1279	1383	1194	1279	1383	1607	1194	1305	1855
Electric Bill (add HPWH)	\$1,514	\$1,304	\$1,628	\$1,583	\$964	\$1,096	\$1,640	\$1,208	\$1,460
Electric Bill Increase	\$159	\$198	\$159	\$165	\$251	\$257	\$158	\$216	\$248
Annual Net Bill Impact	-\$64	-\$68	-\$63	-\$65	\$13	-\$11	-\$69	-\$10	-\$11

Table 5-3

**Basic Use Non-CARE Net Bill Impact Based on TOU Rates
Switching to 50-Gallon HPWH with 3.55 UEF and 125°F Tank Temperature**

<i>Basic</i>	P	Q	R	S	T	V	W	X	Y
Gas	Non-CARE								
Gas Rate Schedule	G1								
Gas Annual Usage	555	579	427	437	457	492	396	490	639
Gas Bill	\$938	\$981	\$714	\$723	\$744	\$807	\$654	\$807	\$1,050
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$607	\$639	\$411	\$412	\$421	\$451	\$361	\$487	\$687
Gas Bill Saving	\$330	\$342	\$303	\$312	\$323	\$356	\$293	\$320	\$363
Electric	Non-CARE								
Electric Rate Schedule (Before)	E-TOU-C								
Electric Rate Schedule (After, Optimal)	E-ELEC								
Electric Annual Usage (Before)	7139	6410	7989	7884	4215	5475	8063	6306	5436
Electric Bill (Before)	\$1,958	\$1,702	\$2,246	\$2,234	\$1,118	\$1,498	\$2,284	\$1,738	\$1,402
HPWH Usage	1051	1140	977	1051	1140	1334	977	1075	1591
Electric Bill (add HPWH)	\$2,187	\$1,952	\$2,436	\$2,418	\$1,439	\$1,766	\$2,475	\$1,966	\$1,844
Electric Bill Increase	\$229	\$249	\$189	\$184	\$321	\$268	\$191	\$228	\$442
Annual Net Bill Impact	-\$101	-\$93	-\$113	-\$128	-\$1	-\$88	-\$101	-\$92	\$79

Table 5-4

**Basic Use CARE Net Bill Impact Based on TOU Rates
Switching to 50-Gallon HPWH with 3.55 UEF and 125°F Tank Temperature**

<i>Basic</i>	P	Q	R	S	T	V	W	X	Y
Gas	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Gas Rate Schedule	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L
Gas Annual Usage	433	543	380	397	393	457	384	396	553
Gas Bill	\$544	\$713	\$485	\$504	\$489	\$577	\$494	\$493	\$691
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$320	\$447	\$264	\$274	\$251	\$309	\$267	\$267	\$432
Gas Bill Saving	\$224	\$266	\$221	\$230	\$238	\$267	\$227	\$226	\$259
Electric	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Electric Rate Schedule (Before)	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L
Electric Rate Schedule (After, Optimal)	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L	E-ELEC-L
Electric Annual Usage (Before)	7552	6418	7999	7705	4147	4828	8029	5671	6879
Electric Bill (Before)	\$1,355	\$1,106	\$1,470	\$1,418	\$713	\$839	\$1,481	\$992	\$1,212
HPWH Usage	1051	1140	977	1051	1140	1334	977	1075	1591
Electric Bill (add HPWH)	\$1,480	\$1,267	\$1,596	\$1,549	\$927	\$1,055	\$1,608	\$1,173	\$1,421
Electric Bill Increase	\$126	\$162	\$126	\$131	\$214	\$216	\$126	\$182	\$209
Annual Net Bill Impact	-\$98	-\$104	-\$95	-\$99	-\$23	-\$52	-\$101	-\$44	-\$50

Similarly, All-Electric customers too can achieve net bill savings by adopting a more efficient HPWH model (3.7 or above) and operate it at the 120°F temperature. See Tables 5-5 and 5-6 below.

Table 5-5

**All-Electric Non-CARE Net Bill Impact Based on TOU Rates
Switching to 50-Gallon HPWH with 3.7 UEF and 120°F Tank Temperature**

<i>All-Electric</i>	P	Q	R	S	T	V	W	X	Y
Gas	Non-CARE								
Gas Rate Schedule	G1								
Gas Annual Usage	536	553	349	343	352	529	349	314	664
Gas Bill	\$898	\$927	\$557	\$541	\$547	\$882	\$560	\$488	\$1,104
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$572	\$588	\$290	\$265	\$259	\$512	\$287	\$213	\$737
Gas Bill Saving	\$326	\$339	\$267	\$276	\$288	\$371	\$273	\$276	\$367
Electric	Non-CARE								
Electric Rate Schedule (Before)	E-TOU-C								
Electric Rate Schedule (After, Optimal)	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C	E-TOU-C	E-ELEC	E-TOU-C	E-TOU-C	E-ELEC
Electric Annual Usage (Before)	6875	6882	7869	7304	4150	7230	8268	5668	8397
Electric Bill (Before)	\$1,724	\$1,701	\$2,034	\$1,867	\$1,000	\$1,854	\$2,183	\$1,441	\$2,128
HPWH Usage	871	949	807	871	949	1117	807	893	1375
Electric Bill (add HPWH)	\$1,942	\$1,944	\$2,233	\$2,085	\$1,277	\$2,120	\$2,396	\$1,711	\$2,491
Electric Bill Increase	\$218	\$243	\$199	\$218	\$277	\$266	\$214	\$270	\$363
Annual Net Bill Impact	-\$108	-\$96	-\$68	-\$58	-\$11	-\$104	-\$59	-\$6	-\$4

Table 5-6

**All-Electric CARE Net Bill Impact Based on TOU Rates
Switching to 50-Gallon HPWH with 3.7 UEF and 120°F Tank Temperature**

All-Electric	P	Q	R	S	T	V	W	X	Y
Gas	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Gas Rate Schedule	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L	G1L
Gas Annual Usage	492	565	315	286	325	481	363	288	626
Gas Bill	\$636	\$751	\$394	\$354	\$396	\$616	\$462	\$352	\$805
Gas Water Heater Usage Saved	171	183	162	171	183	199	162	175	197
Gas Bill (w/o Water Heater)	\$394	\$484	\$186	\$139	\$169	\$340	\$241	\$135	\$525
Gas Bill Saving	\$242	\$267	\$208	\$215	\$227	\$277	\$221	\$217	\$280
Electric	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE	CARE
Electric Rate Schedule (Before)	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L
Electric Rate Schedule (After, Optimal)	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L	E-ELEC-L	E-TOU-C-L	E-TOU-C-L	E-TOU-C-L
Electric Annual Usage (Before)	7405	6500	7838	7113	4153	6669	9147	5452	8206
Electric Bill (Before)	\$1,207	\$1,030	\$1,320	\$1,181	\$652	\$1,088	\$1,603	\$896	\$1,347
HPWH Usage	871	949	807	871	949	1117	807	893	1375
Electric Bill (add HPWH)	\$1,349	\$1,189	\$1,450	\$1,323	\$832	\$1,300	\$1,745	\$1,067	\$1,595
Electric Bill Increase	\$142	\$158	\$130	\$142	\$179	\$213	\$143	\$170	\$248
Annual Net Bill Impact	-\$100	-\$109	-\$79	-\$73	-\$48	-\$64	-\$78	-\$46	-\$32

6. Conclusion

In conclusion, PG&E’s Supplemental Study shows that, on average, E-1 customers who switch from a gas water heater to a typical industry-prevalent HPWH are likely to see a net bill savings by taking service on PG&E’s new pro-electrification rate, Schedule E-ELEC. Even if customers have a strong preference for tiered non-TOU rates and choose to stay on E-1 after switching to a HPWH, an average E-1 customer can still achieve net bill savings by adopting more efficient HPWH models and operate them at a lower tank temperature.

The only exception is for a very small number of average customers in Territory Y, where higher elevation and cooler ambient air temperature and water mains temperature may make the HPWH rely more on the electric resistance elements rather than the more efficient heat pump. Importantly, the population in Territory Y does not even reach one percent of total PG&E’s customer population. This conclusion applies to both Basic and All-Electric baseline customers. Moreover, these customers in Territory Y may potentially gain net bill savings by employing systems that do not have electric resistance elements, such as the upcoming 120V HPWH and certain systems utilizing CO2 as its refrigerant and changing the HPWH operation such as load shifting. Systems using CO2 as its refrigerant will have an advantage in the colder climates since they are able to operate at a lower ambient temperature than other heat pumps. These customers may also see bill savings by employing load shifting to minimize energy consumption during peak hours and loading the water heater during off-peak times.

Although for the most part the Study and the Supplemental Study only look at 2020 prices, the results presented in Section 4 – which do not constrain a customer from selecting a TOU rate like E-ELEC if that would provide a lower bill, and which are based on updated 2022 gas and electric rates that more accurately reflect the current situation -- are even

more promising, with better net bill impact results compared to those obtained based on 2020 rates.¹⁹ In the long run, the net bill savings from moving to an HPWH in PG&E's service territory is expected to grow over time, especially as higher efficiency HPWH models become more dominant in this emerging market and as the gas price continue to grow in a fast speed as the electrification effort progresses.

PG&E will also be submitting a proposal to conduct a formal Measurement and Evaluation (M&E) study to better understand the customers who engage in electrification efforts, and the information collected via the M&E study is intended to be used to inform both programmatic enhancements and rate design.²⁰ PG&E welcomes Energy Division staff to participate in the M&E study and provide guidance on enhancing PG&E's electrification rate design. Based on the M&E study, PG&E would also like to take the opportunity to market these new TOU rates (E-ELEC and EV2-A rates) to existing non-TOU E-1 customers to show them the benefits of electrification under these rates and support the CPUC's pro-TOU and pro-electrification policies before making modifications to the rate plans.

¹⁹ PG&E's Schedule E-ELEC rate is currently planned for Q1 2023 and Schedule EV-2A will be available for HPWH adopters by late 2022.

²⁰ Decision (D.) 21-11-016 approved the Residential Settlement for E-ELEC, but with the added stipulation that PG&E complete its workshop process and then file a Tier 3 advice letter that proposes a M&E plan and budget (Section 7.2.6 "Measurement and Evaluation of E-ELEC" p. 115-116). In compliance with D. 21-11-016, the first required workshop was held on February 16, 2022, with stakeholders being provided an additional review period until March 2022. The Tier 3 advice letter with the M&E proposal and budget is estimated to be submitted by the end of June 2022.

**PG&E Gas and Electric
Advice Submittal List
General Order 96-B, Section IV**

AT&T
Albion Power Company

Alta Power Group, LLC
Anderson & Poole

Atlas ReFuel
BART

Barkovich & Yap, Inc.
Braun Blasing Smith Wynne, P.C.
California Cotton Ginners & Growers Assn
California Energy Commission

California Hub for Energy Efficiency
Financing

California Alternative Energy and
Advanced Transportation Financing
Authority
California Public Utilities Commission
Calpine

Cameron-Daniel, P.C.
Casner, Steve
Center for Biological Diversity

Chevron Pipeline and Power
City of Palo Alto

City of San Jose
Clean Power Research
Coast Economic Consulting
Commercial Energy
Crossborder Energy
Crown Road Energy, LLC
Davis Wright Tremaine LLP
Day Carter Murphy

Dept of General Services
Don Pickett & Associates, Inc.
Douglass & Liddell

East Bay Community Energy Ellison
Schneider & Harris LLP
Engineers and Scientists of California

GenOn Energy, Inc.
Goodin, MacBride, Squeri, Schlotz &
Ritchie
Green Power Institute
Hanna & Morton
ICF
International Power Technology

Intertie

Intestate Gas Services, Inc.
Kelly Group
Ken Bohn Consulting
Keyes & Fox LLP
Leviton Manufacturing Co., Inc.

Los Angeles County Integrated
Waste Management Task Force
MRW & Associates
Manatt Phelps Phillips
Marin Energy Authority
McClintock IP
McKenzie & Associates

Modesto Irrigation District
NLine Energy, Inc.
NRG Solar

OnGrid Solar
Pacific Gas and Electric Company
Peninsula Clean Energy

Pioneer Community Energy

Public Advocates Office

Redwood Coast Energy Authority
Regulatory & Cogeneration Service, Inc.
SCD Energy Solutions
San Diego Gas & Electric Company

SPURR
San Francisco Water Power and Sewer
Sempra Utilities

Sierra Telephone Company, Inc.
Southern California Edison Company
Southern California Gas Company
Spark Energy
Sun Light & Power
Sunshine Design
Tecogen, Inc.
TerraVerde Renewable Partners
Tiger Natural Gas, Inc.

TransCanada
Utility Cost Management
Utility Power Solutions
Uplight
Water and Energy Consulting Wellhead
Electric Company
Western Manufactured Housing
Communities Association (WMA)
Yep Energy