

2022 CODE CYCLE:
**Addendum to the 2022
Cost-Effectiveness Study:
Single Family New Construction
Cost Assumption Adjustments
for Climate Zones 3, 4, and 12**

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Acronym List

ADU – Accessory Dwelling Unit

B/C – Benefit-to-Cost Ratio

CBECC - California Building Energy Code Compliance

CBSC - California Building Standards Commission

CEC - California Energy Commission

CZ – Climate Zone

GHG - Greenhouse Gas

HPWH – Heat pump water heater

IOU – Investor-Owned Utility

PG&E – Pacific Gas & Electric (utility)

kWh – Kilowatt Hour

NEEA – Northwest Energy Efficiency Alliance

NPV – Net Present Value

PV - Solar Photovoltaic

TDV - Time Dependent Valuation

Title 24 – California Code of Regulations Title 24, Part 6

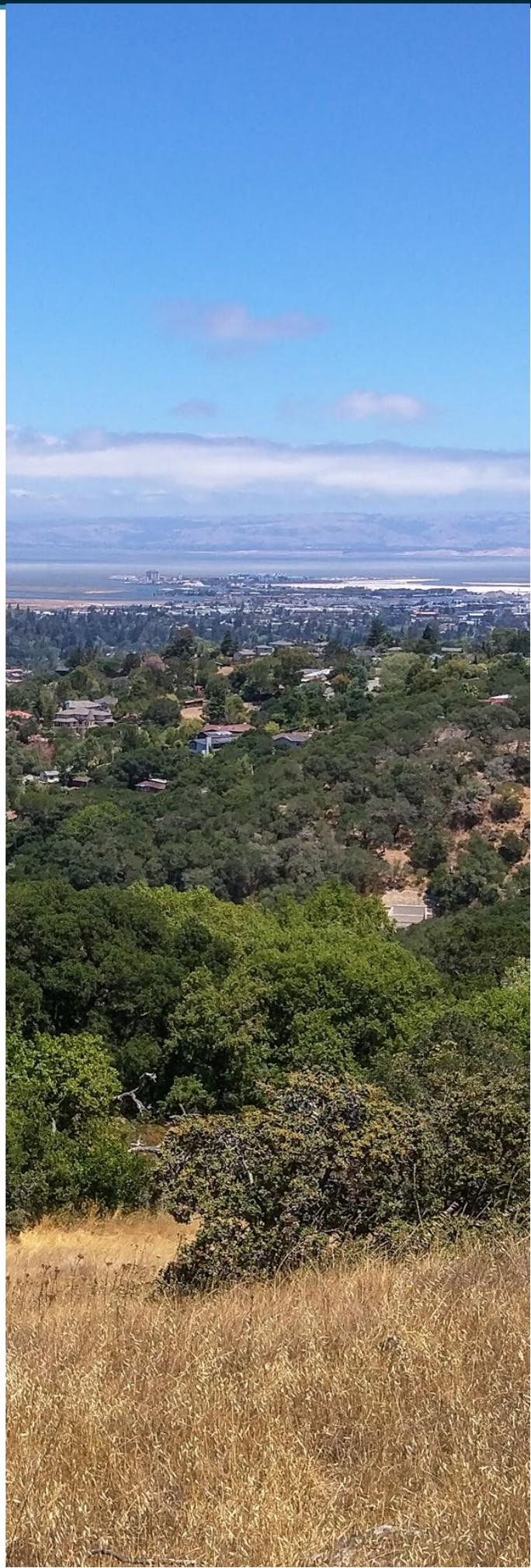


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1 Introduction

The California Codes and Standards (C&S) Reach Codes program provides technical support to local governments considering adopting a local ordinance (reach code) intended to support meeting local and/or statewide energy efficiency and greenhouse gas reduction goals. The program facilitates adoption and implementation of the code when requested by local jurisdictions by providing resources such as cost-effectiveness studies, model language, sample findings, and other supporting documentation.

This addendum to the [2022 Single Family New Construction Cost-effectiveness Study](#) (Statewide Reach Code Team, 2022) includes examining the impact of adjusted residential natural gas prices and additional supplemental analysis requested by the Building Decarbonization Coalition, Natural Resources Defense Council, Peninsula Clean Energy (PCE) and Silicon Valley Clean Energy (SVCE). The addendum analyzes cost-effectiveness of all-electric homes in Climates Zones 3, 4 and 12 that meet or exceed the minimum state requirements, the 2022 Building Energy Efficiency Standards, effective January 1, 2023, in newly constructed buildings.

The prototype building designs analyzed in this study are newly constructed:

- Single Family Home
- Detached Accessory Dwelling Unit (ADU)

The methodology, prototype characteristics, and measure packages are retained from the main study referenced above except this analysis includes updates to incorporate recent PG&E utility rate changes and revised all-electric packages based on conversations with PCE and SVCE staff.

Model ordinance language and other resources are posted on the C&S Reach Codes Program website at [LocalEnergyCodes.com](https://localenergycodes.com). Local jurisdictions that are considering adopting an ordinance may contact the program for further technical support at info@localenergycodes.com.

This addendum was developed in coordination with the California Statewide Investor Owned Utilities (IOUs) Codes and Standards Program, key consultants, and engaged cities — collectively known as the Reach Codes Team.

2 Methodology and Assumptions

All methodology and assumptions are consistent with that from the statewide analysis (Statewide Reach Code Team, 2022) with the following three exceptions. Additional details are provided in the sections below.

1. Revised PG&E gas and electricity rates were used to calculate first year utility bills.
2. Evaluated new packages to consider the impacts of Northwest Energy Efficiency Alliance (NEEA) certified heat pump water heater (HPWH) products.
3. Removed utility subsidies for gas main distribution line extension costs based on the recent California Public Utilities Commission (CPUC) ruling that eliminates these subsidies effective July 1, 2023.

2.1 Utility Rates

PG&E gas and electricity rates were updated to reflect the latest rates as of October 2022. The rates used in the original study were selected in March 2022, prior to subsequent market volatility. The approach to applying monthly gas rates was also updated. See Appendix 6.2 for details.

First-year utility costs were calculated using hourly electricity and natural gas output from CBECC-Res and applying the utility tariffs summarized in Table 1.

Table 1. Utility Tariffs

Electric / Gas Utility	Electricity	Natural Gas
Residential (Single Family and Detached ADU)		
PG&E / PG&E	E-TOU Option C	G-1

Utility rates are assumed to escalate over time, using assumptions detailed in Appendix 6.2.

2.2 Packages

Three packages were considered in this analysis as described below.

1. All-Electric Code Minimum: This package meets all the prescriptive requirements of the 2022 Title 24 Code. In Climate Zone 4 for the ADU prototype the prescriptive minimum package did not comply with code and a compact hot water credit efficiency measure was added to meet minimum compliance requirements.
2. All-Electric Code Minimum & NEEA Tier 3 (Preempted): Two NEEA Tier 3 HPWHs were simulated in CBECC-Res and found to have similar energy use. Single family results are based on a Rheem PROPH80 T2 RH350 DCB HPWH or similar. For the ADU prototype, the same HPWH model was used but with a 50-gal tank.
3. All-Electric Code Minimum & NEEA Tier 4 (Preempted): The market is shifting towards Tier 4 rated HPWHs and this scenario evaluates the impact on energy use with a higher efficiency product that also has load shifting capabilities. Results are based on a Rheem PROPH80 T2 RH375-30 or similar HPWH which qualifies for the Basic load shifting credit per the 2022 Title 24, Part 6 requirement. For the ADU prototype, the same HPWH model was used but with a 50-gal tank.

The incremental cost assumptions are listed in Table 2 below.

Table 2. NEEA HPWH Incremental Costs

Measure	Incremental Cost Relative to Federal Minimum HPWH		
	First Cost	Replacement Cost	Total Lifetime Financed
NEEA Tier 3 HPWH	\$0	\$0	\$0
NEEA Tier 4 HPWH + Load Shifting	\$150	\$0	\$168

2.3 Gas Infrastructure Costs

Utility Gas Main Extensions rules have historically categorized distribution line extensions as “refundable” costs, which are offset or subsidized by all other ratepayers. The CPUC issued a Final Decision¹ in September 2022 that will eliminate the subsidies effective July 1, 2023.² The subsidies that were included in the statewide analysis (Statewide Reach Code Team, 2022) have been removed as part of the results shown in this report. Table 3 presents the resultant total estimated costs for natural gas infrastructure per single family home after the subsidies are removed. This is considered a cost savings for all-electric homes.

Table 3. Single Family Total Natural Gas Infrastructure Costs

	PG&E
Total Cost	\$4,560

The CPUC ruling does not impact the ADU analysis. When developing on an existing lot or in an infill scenario the existing natural gas infrastructure onsite is utilized in most cases without a need for a distribution line extension.

¹ <https://docs.cpuc.ca.gov/SearchRes.aspx?docformat=ALL&docid=496876177>

² <https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-decision-makes-ca-first-state-in-country-to-eliminate-natural-gas-subsidies>

3 Results

Results are presented as per the measure packages described in Section 2. Designation of a ‘benefit’ or a ‘cost’ varies with the scenarios because both energy savings, and incremental construction costs may be negative depending on the package. Typically, utility bill savings are categorized as a ‘benefit’ while incremental construction costs are treated as ‘costs.’ In all-electric new construction cases where both construction costs are negative and utility bill savings are negative, the construction cost savings are treated as the ‘benefit’ while the utility bill negative savings are the ‘cost.’

Table 4, Table 5, and Table 6 show results for the single family and ADU prototypes for Climate Zone 3, 4, and 12, respectively. All packages are cost-effective based on TDV. The single family NEEA Tier 3 and 4 packages are all On-Bill cost-effective; additionally, the code compliant all-electric single family home is On-Bill cost-effective in Climate Zone 12. None of the ADU packages are On-Bill cost effective.

Table 4. Climate Zone 3 Cost-Effectiveness Summary

Case	Efficiency EDR2 Margin	Annual Elec Savings (kWh)	Annual Gas Savings (therms)	Average Annual GHG Reductions (metric tons)	Utility Cost Savings		Incremental Cost		On-Bill		TDV	
					First Year	Lifecycle (2022\$)	First Year	Lifecycle (2022\$)	B/C Ratio	NPV	B/C Ratio	NPV
Single Family All-Electric												
Code Minimum	4.7	-2,413	171	0.7	(\$428)	(\$7,348)	(\$6,156)	(\$6,261)	0.9	(\$1,087)	78.0	\$5,434
NEEA 3	9.2	-2,134	171	0.7	(\$333)	(\$5,086)	(\$6,156)	(\$6,261)	1.2	\$1,175	>1	\$6,966
NEEA 4 + Load Shifting	11.0	-2,058	171	0.7	(\$306)	(\$4,444)	(\$6,006)	(\$6,093)	1.4	\$1,649	>1	\$7,397
ADU All-Electric												
Code Minimum	0.0	-1,665	123	0.5	(\$335)	(\$6,024)	(\$2,457)	(\$2,106)	0.3	(\$3,918)	2.0	\$888
NEEA 3	5.9	-1,481	123	0.5	(\$269)	(\$4,465)	(\$2,457)	(\$2,106)	0.5	(\$2,358)	>1	\$1,812
NEEA 4 + Load Shifting	8.6	-1,427	123	0.6	(\$248)	(\$3,968)	(\$2,307)	(\$1,938)	0.5	(\$2,030)	>1	\$2,081

Table 5. Climate Zone 4 Cost-Effectiveness Summary

Case	Efficiency EDR2 Margin	Annual Elec Savings (kWh)	Annual Gas Savings (therms)	Average Annual GHG Reductions (metric tons)	Utility Cost Savings		Incremental Cost		On-Bill		TDV	
					First Year	Lifecycle (2022\$)	First Year	Lifecycle (2022\$)	B/C Ratio	NPV	B/C Ratio	NPV
Single Family All-Electric												
Code Minimum	3.7	-2,233	163	0.7	(\$378)	(\$6,314)	(\$6,156)	(\$6,261)	1.0	(\$53)	>1	\$5,949
NEEA 3	5.8	-2,017	163	0.7	(\$305)	(\$4,564)	(\$6,156)	(\$6,261)	1.4	\$1,697	>1	\$6,947
NEEA 4 + Load Shifting	6.8	-1,964	163	0.7	(\$285)	(\$4,100)	(\$6,006)	(\$6,093)	1.5	\$1,993	>1	\$7,221
ADU All-Electric												
Code Minimum	0.2	-1,591	118	0.5	(\$300)	(\$5,295)	(\$2,457)	(\$2,106)	0.4	(\$3,188)	11.2	\$1,643
NEEA 3	4.0	-1,436	118	0.5	(\$249)	(\$4,088)	(\$2,457)	(\$2,106)	0.5	(\$1,982)	>1	\$2,393
NEEA 4 + Load Shifting	5.0	-1,404	118	0.5	(\$240)	(\$3,884)	(\$2,307)	(\$1,938)	0.5	(\$1,946)	>1	\$2,434

Table 6. Climate Zone 12 Cost-Effectiveness Summary

Case	Efficiency EDR2 Margin	Annual Elec Savings (kWh)	Annual Gas Savings (therms)	Average Annual GHG Reductions (metric tons)	Utility Cost Savings		Incremental Cost		On-Bill		TDV	
					First Year	Lifecycle (2022\$)	First Year	Lifecycle (2022\$)	B/C Ratio	NPV	B/C Ratio	NPV
Single Family All-Electric												
Code Minimum	4.0	-2,751	213	0.7	(\$373)	(\$5,162)	(\$6,308)	(\$6,380)	1.2	\$1,217	>1	\$6,022
NEEA 3	6.2	-2,492	213	0.8	(\$287)	(\$3,124)	(\$6,308)	(\$6,380)	2.0	\$3,256	>1	\$7,319
NEEA 4 + Load Shifting	7.0	-2,436	213	0.8	(\$267)	(\$2,652)	(\$6,158)	(\$6,211)	2.3	\$3,559	>1	\$7,651
ADU All-Electric												
Code Minimum	0.3	-1,283	69	0.2	(\$267)	(\$5,400)	(\$3,260)	(\$2,957)	0.5	(\$2,443)	1.4	\$716
NEEA 3	4.5	-1,078	69	0.2	(\$205)	(\$3,939)	(\$3,260)	(\$2,957)	0.8	(\$982)	3.3	\$1,776
NEEA 4 + Load Shifting	5.8	-1,028	69	0.2	(\$191)	(\$3,602)	(\$3,110)	(\$2,789)	0.8	(\$813)	5.4	\$1,957

4 Summary

This addendum supplements the statewide reach code report by including updates to the PG&E gas and electricity rates, removal of utility subsidies for gas main distribution line extension costs, and new packages to consider the impacts of NEEA HPWH products.

Table 7 summarizes results for the two prototypes and three packages and depicts the efficiency EDR2 compliance margins achieved for each climate zone and package. Because local reach codes that are intended to extend above the Energy Code must both exceed the Energy Commission performance budget (i.e., have a positive compliance margin) and be cost-effective, the Reach Codes Team highlighted cells meeting these two requirements to help clarify the upper boundary for potential reach code policies. All results presented in this study have a positive compliance margin.

- Cells highlighted in **green** depict a positive compliance margin and cost-effective results using both On-Bill and TDV approaches.
- Cells highlighted in **yellow** depict a positive compliance and cost-effective results using either the On-Bill or TDV approach.
- Cells **not highlighted** depict a package that was not cost effective using either the On-Bill or TDV approach.

The Reach Codes Team found all-electric code compliant new construction to be feasible and cost effective based on TDV under all scenarios and based on utility cost for the single family home in most cases. While the code compliant all-electric building had higher first year utility costs, the cost savings from not installing gas infrastructure was enough to offset this. Combining higher capacity PV systems and all-electric construction does reduce utility costs.

Table 7: Summary of All-Electric Efficiency EDR2 Margins and Cost-Effectiveness

Climate Zone	Single Family			ADU		
	Code Min	Tier 3	Tier 4	Code Min	Tier 3	Tier 4
CZ03	4.7	9.2	11.0	0.0	5.9	8.6
CZ04	3.7	5.8	6.8	0.2	4.0	5.0
CZ12	4.0	6.2	7.0	0.3	4.5	5.8

5 References

California Public Utilities Commission. (2021a). *Utility Costs and Affordability of the Grid of the Future: An Evaluation of Electric Costs, Rates, and Equity Issues Pursuant to P.U. Code Section 913.1*. Retrieved from https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2021/senate-bill-695-report-2021-and-en-banc-whitepaper_final_04302021.pdf

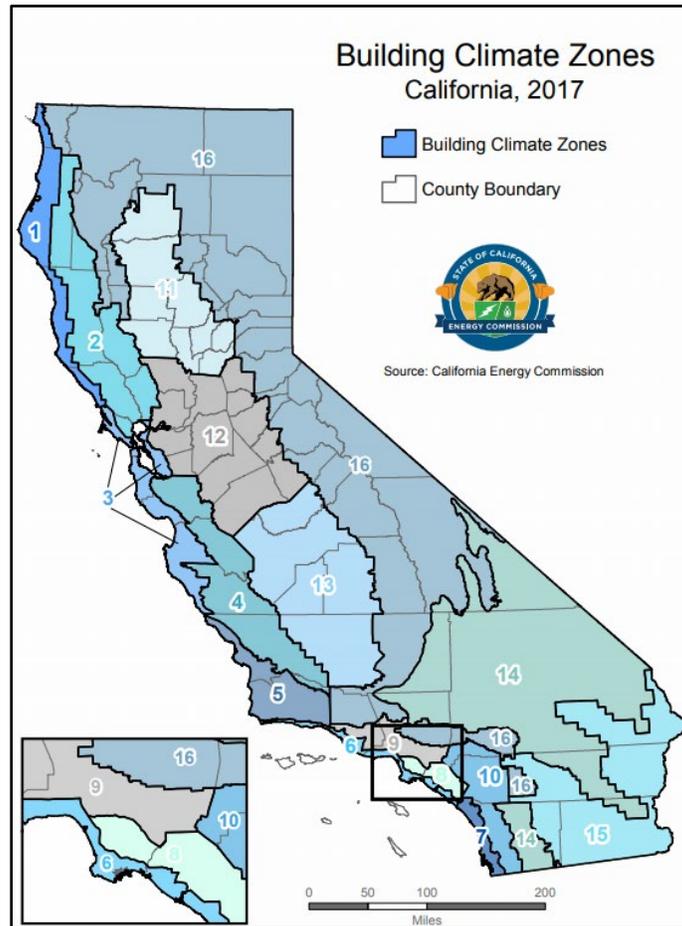
Statewide Reach Code Team. (2022, September). *2022 Cost-Effectiveness Study: Single Family New Construction*. Prepared for Pacific Gas and Electric Company. Prepared by Frontier Energy. Retrieved from https://localenergycodes.com/download/1240/file_path/fieldList/2022%20Single%20Family%20NewCon%20Cost-eff%20Study.docx

6 Appendices

6.1 Map of California Climate Zones

Climate zone geographical boundaries are depicted in Figure 1. The map in Figure 1 along with a zip-code search directory is available at: https://ww2.energy.ca.gov/maps/renewable/building_climate_zones.html

Figure 1. Map of California climate zones.



6.2 Utility Rate Schedules

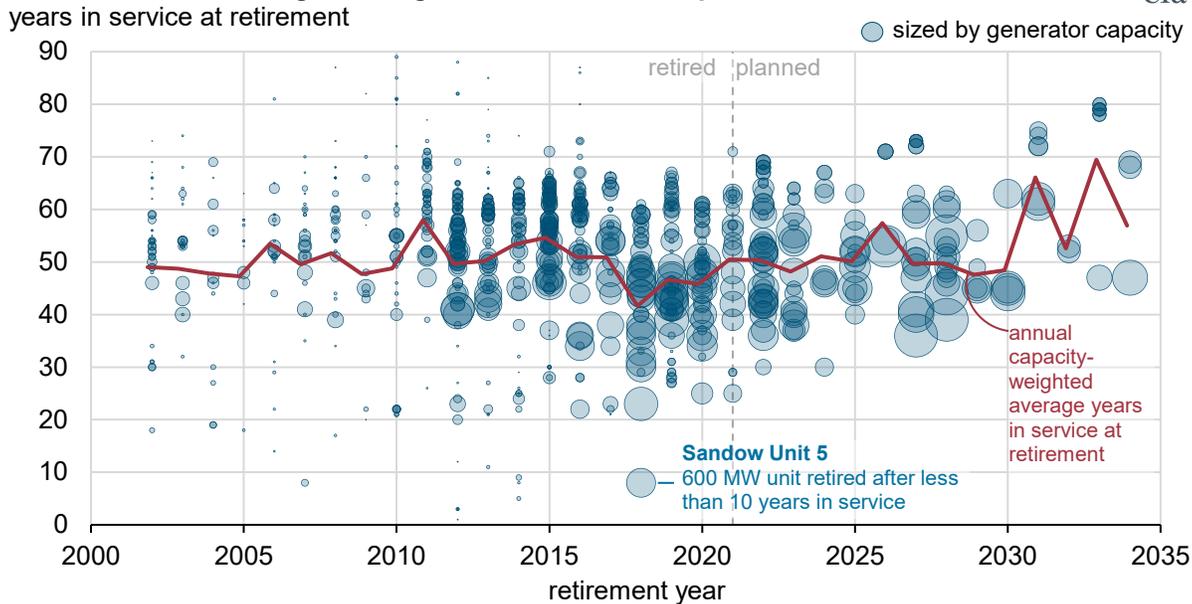
The Reach Codes Team used PG&E tariffs detailed below to determine the On-Bill savings for each package.

6.2.1 Demand Pressure in US Natural Gas Markets

US natural gas markets have experienced record price volatility in 2022, reaching its highest level in 20 years in Q1, primarily driven by both domestic and global demand. While geopolitical uncertainty and weather-driven demand will continue to affect both short-term demand and production, shifts in long-term demand will continue to apply pressure to US natural gas prices.

The US electric power sector uses more natural gas than any other US end-use sector; and despite high prices through Q3 2022, natural gas consumption has increased 7%.³ The continued retirement of coal-fired power plants have provided stable and growing demand and price support. The average age of the US coal fleet (45 years), political and regulatory pressure on coal generation to reduce CO₂ emissions, and improving technologies have all combined to accelerate the shift towards cleaner electricity production; even despite the disparity in current and forecasted delivered utility fuel pricing (\$2.10/MMBtu versus \$6.25/MMBtu)⁴. With nearly one-third of the US coal fleet retiring between 2010-2020 and a quarter of the remaining capacity announcing plans to retire by 2035,⁵ the electric power sector’s demand for natural gas will continue to grow until cheaper (namely renewable energy sources) are brought to market.

U.S. coal-fired electric generating unit retirements and planned retirements



In addition to growing domestic natural gas demand, global natural gas demand has continued a steady climb and is increasingly affecting US domestic supply markets. Global natural gas demand in 2021 reached a new all-time high, surpassing the previous record set in 2019 by 3.3%.⁷ Historically, the US domestic natural gas market had been

³ U.S. Energy Information Administration, [Short-Term Energy Outlook](#) (STEO), September 2022

⁴ U.S. Energy Information Administration, 2022-2023 Winter Fuels Outlook, July 2022

⁵ [Environmental and Energy Policy and the Economy, volume 3](#) PUBLISHER: [University of Chicago Press](#)

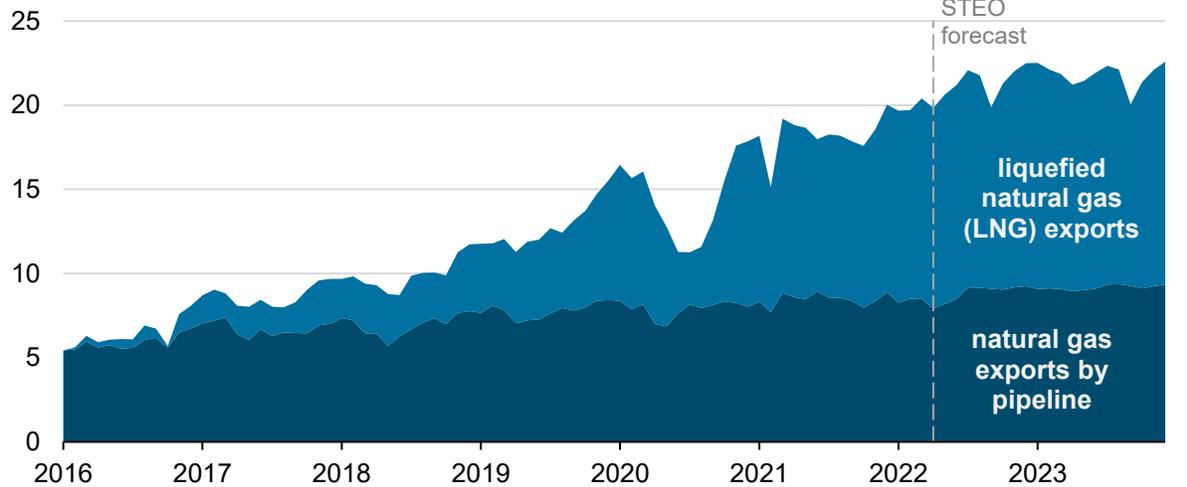
⁶ U.S. Energy Information Administration, [Preliminary Monthly Electric Generator Inventory](#), September 2021

⁷ BP Statistical Review of World Energy - 2022

isolated from global markets; consuming most of the gas it produced with some imports. [insert production/consumption data]. But with US natural gas production reaching all-time highs for the last 10 years, the US has become a net exporter of natural gas primarily through liquefied natural gas (LNG) production. Historically large price dislocations between the US and European/Asian natural gas markets have spurred investments in many LNG terminals, and over the past decade the U.S. has become the world’s fastest-growing LNG exporter and is on a pace to become the world’s largest LNG exporter by the end of 2022. The rush to export LNG has absorbed the excess production within the US and fundamentally shifted the dynamics of pricing in the domestic marketplace. With US natural gas production now exposed to global markets, domestic pricing will continue to feel the tailwind of global demand.

Monthly U.S. natural gas exports (Jan 2016–Dec 2023)

billion cubic feet per day



6.2.2 Pacific Gas and Electric

The following provide details on the PG&E electricity and natural gas tariffs applied in this study. Table 8 describes the baseline territories that were assumed for each climate zone. The California Climate Credit was applied for both electricity and natural gas service using the 2022 credits of \$78.60 for electricity and \$47.83 for natural gas. The credits were applied to reduce the total calculated annual bill, including any fixed fees or minimum bill amounts.

Table 8: PG&E Baseline Territory by Climate Zone

	Baseline Territory
CZ03	T
CZ04	X
CZ12	S

⁸ U.S. Energy Information Administration, [Short-Term Energy Outlook](#) (STEO) April 2022

6.2.2.1 Gas Rates

The PG&E monthly gas rate in \$/therm applied in this analysis is shown in Table 9.

Table 9: PG&E Monthly Gas Rate (\$/therm)

Month	Total Charge	
	Baseline	Excess
Jan	\$2.25	\$2.68
Feb	\$2.29	\$2.72
Mar	\$2.17	\$2.61
Apr	\$2.14	\$2.59
May	\$2.12	\$2.58
June	\$2.13	\$2.59
July	\$2.14	\$2.60
Aug	\$2.20	\$2.66
Sept	\$2.22	\$2.69
Oct	\$2.26	\$2.73
Nov	\$2.36	\$2.80
Dec	\$2.38	\$2.82

The gas rates for this addendum were developed based on the latest available gas rate for October 2022 and a curve to reflect how natural gas prices fluctuate with seasonal supply and demand. The seasonal curve was estimated from PG&E’s monthly residential tariffs between 2012 and 2021. 12-month curves were created from monthly gas rates for each of the ten years. The 10 annual curves were then averaged to arrive at an average normalized annual curve. This was conducted separately for baseline and excess energy rates. The resultant curves are shown in Figure 2. The costs presented in Table 8 were then derived by establishing the October baseline and excess rates from the latest 2022 tariff as a reference point, and then using the normalized curve to estimate the cost for the remaining months relative to the October rates.

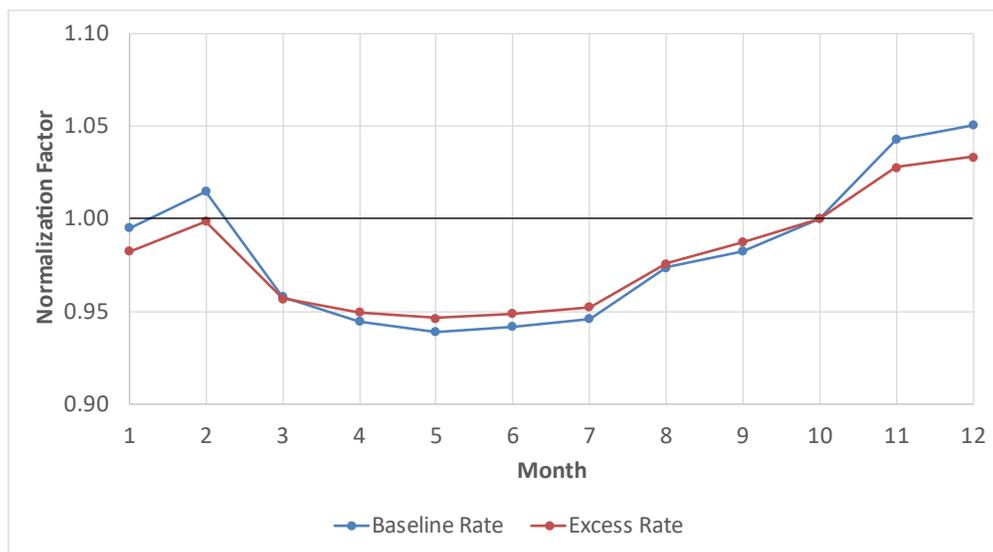


Figure 2: Seasonal curve based on 10-years of historical PG&E gas rates.

GAS SCHEDULE G-1
RESIDENTIAL SERVICE

Sheet 1

APPLICABILITY: This rate schedule¹ applies to natural gas service to Core End-Use Customers on PG&E's Transmission and/or Distribution Systems. To qualify, service must be to individually-metered single family premises for residential use, including those in a multifamily complex, and to separately-metered common areas in a multifamily complex where Schedules GM, GS, or GT are not applicable. Common area accounts that are separately metered by PG&E have an option of switching to a core commercial rate schedule. Common area accounts are those accounts that provide gas service to common use areas as defined in Rule 1.

Per D.15-10-032 and D.18-03-017, transportation rates include GHG Compliance Cost for non-covered entities. Customers who are directly billed by the Air Resources Board (ARB), i.e., covered entities, are exempt from paying AB 32 GHG Compliance Costs through PG&E's rates.² A "Cap-and-Trade Cost Exemption" credit for these costs will be shown as a line item on exempt customers' bills.^{3,4}

TERRITORY: Schedule G-1 applies everywhere within PG&E's natural gas Service Territory.

RATES: Customers on this schedule pay a Procurement Charge and a Transportation Charge, per meter, as shown below. The Transportation Charge will be no less than the Minimum Transportation Charge, as follows:

<u>Minimum Transportation Charge:</u> ⁵		<u>Per Day</u>	
		\$0.13151	
		<u>Per Therm</u>	
	<u>Baseline</u>		<u>Excess</u>
<u>Procurement:</u>	\$0.90008 (l)		\$0.90008 (l)
<u>Transportation Charge:</u>	<u>\$1.36083</u>		<u>\$1.82882</u>
Total:	\$2.26091 (l)		\$2.72890 (l)
California Natural Gas Climate Credit (per Household, annual payment occurring in the April bill cycle)	(\$47.83)		

Public Purpose Program Surcharge:

Customers served under this schedule are subject to a gas Public Purpose Program (PPP) Surcharge under Schedule G-PPPS.

See Preliminary Statement, Part B for the Default Tariff Rate Components.

The Procurement Charge on this schedule is equivalent to the rate shown on informational Schedule G-CP—Gas Procurement Service to Core End-Use Customers.

- ¹ PG&E's gas tariffs are available online at www.pge.com.
- ² Covered entities are not exempt from paying costs associated with LUAF Gas and Gas used by Company Facilities.
- ³ The exemption credit will be equal to the effective non-exempt AB 32 GHG Compliance Cost Rate (\$ per therm) included in Preliminary Statement – Part B, multiplied by the customer's billed volumes (therms) for each billing period.
- ⁴ PG&E will update its billing system annually to reflect newly exempt or newly excluded customers to conform with lists of Directly Billed Customers provided annually by the ARB.
- ⁵ The Minimum Transportation charge does not apply to submetered tenants of master-metered customers served under gas rate Schedules GS and GT.

(Continued)

<i>Advice</i>	4659-G	<i>Issued by</i>	<i>Submitted</i>	<u>September 26, 2022</u>
<i>Decision</i>	D.97-10-065 and D. 98-07-025	Meredith Allen <i>Vice President, Regulatory Affairs</i>	<i>Effective</i>	<u>October 1, 2022</u>
			<i>Resolution</i>	



Pacific Gas and Electric Company
U 39 San Francisco, California

Revised Cal. P.U.C. Sheet No. 37762-G
Cancelling Revised Cal. P.U.C. Sheet No. 35436-G

GAS SCHEDULE G-1
RESIDENTIAL SERVICE

Sheet 2

BASELINE QUANTITIES: The delivered quantities of gas shown below are billed at the rates for baseline use.

Baseline Territories	BASELINE QUANTITIES (Therms Per Day Per Dwelling Unit)			(T)
	Summer (April-October)	Winter Off-Peak (Nov, Feb, Mar)	Winter On-Peak (Dec, Jan)	
	Effective Apr. 1, 2022	Effective Nov. 1, 2022	Effective Dec. 1, 2022	

P	0.39	1.88	2.19	(I)
Q	0.56 (R)	1.48 (R)	2.00 (R)	
R	0.36	1.24 (R)	1.81 (R)	
S	0.39	1.38	1.94 (R)	
T	0.56 (R)	1.31 (R)	1.68 (R)	
V	0.59 (R)	1.51	1.71 (R)	
W	0.39	1.14 (R)	1.68 (R)	
X	0.49	1.48 (R)	2.00 (R)	
Y	0.72 (I)	2.22 (I)	2.58 (R)	

SEASONAL CHANGES: The summer season is April-October, the winter off-peak season is November, February and March, and the winter on-peak season is December and January. Baseline quantities for bills that include the April 1, November 1 and December 1 seasonal changeover dates will be calculated by multiplying the applicable daily baseline quantity for each season by the number of days in each season for the billing period.

STANDARD MEDICAL QUANTITIES: Additional medical quantities (Code M) are available as provided in Rule 19.

SURCHARGES: Customers served under this schedule in conjunction with Schedule G-CT, or in conjunction with noncore service, are subject to a franchise fee surcharge under Schedule G-SUR for gas volumes purchased from parties other than PG&E and transported by PG&E.

Customers served under this schedule are subject to a gas Public Purpose Program (PPP) Surcharge under Schedule G-PPPS.

ALTERNATIVE PROCUREMENT OPTIONS: Customers may procure gas supply from a party other than PG&E by taking this schedule in conjunction with Schedule G-CT—Core Gas Aggregation Service. Customers who procure their own gas supply will not pay the Procurement Charge component of this rate schedule shown above and will be subject to the applicable rates specified in Schedule G-CT.

*** The applicable baseline territory is described in Preliminary Statement, Part A.

<i>Advice</i>	4589-G	<i>Issued by</i>	<i>Submitted</i>	March 25, 2022
<i>Decision</i>	97-10-065 and D. 98-07-025	Robert S. Kenney Vice President, Regulatory Affairs	<i>Effective</i>	April 1, 2022
			<i>Resolution</i>	

6.2.2.2 Electricity Rates



Cancelling Revised Cal. P.U.C. Sheet No. 53472-E
 Revised Cal. P.U.C. Sheet No. 52702-E

ELECTRIC SCHEDULE E-TOU-C Sheet 2
 RESIDENTIAL TIME-OF-USE (PEAK PRICING 4 - 9 p.m. EVERY DAY)

RATES: **E-TOU-C TOTAL BUNDLED RATES** (T)
 (Cont'd.)

Total Energy Rates (\$ per kWh)	PEAK		OFF-PEAK	
<i>Summer</i>				
Total Usage	\$0.48902	(I)	\$0.42558	(I)
Baseline Credit (Applied to Baseline Usage Only)	(\$0.09054)	(R)	(\$0.09054)	(R)
<i>Winter</i>				
Total Usage	\$0.39193	(I)	\$0.37460	(I)
Baseline Credit (Applied to Baseline Usage Only)	(\$0.09054)	(R)	(\$0.09054)	(R)
Delivery Minimum Bill Amount (\$ per meter per day)	\$0.34810			
California Climate Credit (per household, per semi-annual payment occurring in the April and October bill cycles)	(\$39.30)			

Total bundled service charges shown on customer's bills are unbundled according to the component rates shown below. Where the delivery minimum bill amount applies, the customer's bill will equal the sum of (1) the delivery minimum bill amount plus (2) for bundled service, the generation rate times the number of kWh used. For revenue accounting purposes, the revenues from the delivery minimum bill amount will be assigned to the Transmission, Transmission Rate Adjustments, Reliability Services, Public Purpose Programs, Nuclear Decommissioning, Competition Transition Charges, Energy Cost Recovery Amount, Wildfire Fund Charge, and New System Generation Charges based on kWh usage times the corresponding unbundled rate component per kWh, with any residual revenue assigned to Distribution.

(Continued)

Advice Decision	6603-E-A	Issued by Robert S. Kenney Vice President, Regulatory Affairs	Submitted Effective Resolution	<u>May 31, 2022</u> <u>June 1, 2022</u> <hr/>
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Pacific Gas and Electric Company

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San Francisco, California

Cancelling Revised

Revised Revised

Cal. P.U.C. Sheet No. 53474-E
Cal. P.U.C. Sheet No. 50175-E

ELECTRIC SCHEDULE E-TOU-C Sheet 4
RESIDENTIAL TIME-OF-USE (PEAK PRICING 4 - 9 p.m. EVERY DAY)

SPECIAL CONDITIONS: 1. **BASELINE (TIER 1) QUANTITIES:** The following quantities of electricity are to be used to define usage eligible for the baseline credit:

Baseline Territory*	BASELINE QUANTITIES (kWh PER DAY)							
	Code B - Basic Quantities				Code H - All-Electric Quantities			
	Summer		Winter		Summer		Winter	
	Tier 1		Tier 1		Tier 1		Tier 1	
P	13.5	(R)	11.0	(R)	15.2	(R)	26.0	(R)
Q	9.8	(R)	11.0	(R)	8.5	(R)	26.0	(R)
R	17.7	(R)	10.4	(R)	19.9	(R)	26.7	(R)
S	15.0	(R)	10.2	(R)	17.8	(R)	23.7	(R)
T	6.5	(R)	7.5	(R)	7.1	(R)	12.9	(R)
V	7.1	(R)	8.1	(R)	10.4	(R)	19.1	(I)
W	19.2	(R)	9.8	(R)	22.4	(R)	19.0	(R)
X	9.8	(R)	9.7	(R)	8.5	(R)	14.6	(R)
Y	10.5	(R)	11.1	(R)	12.0	(R)	24.0	(R)
Z	5.9	(R)	7.8	(R)	6.7	(R)	15.7	(R)

2. **TIME PERIODS FOR E-TOU-C:** Times of the year and times of the day are defined as follows:

Summer (service from June 1 through September 30):

Peak: 4:00 p.m. to 9:00 p.m. All days

Off-Peak: All other times

Winter (service from October 1 through May 31):

Peak: 4:00 p.m. to 9:00 p.m. All days

Off-Peak: All other times

* The applicable baseline territory is described in Part A of the Preliminary Statement

(Continued)

Advice Decision	6603-E-A	Issued by Robert S. Kenney Vice President, Regulatory Affairs	Submitted Effective Resolution	May 31, 2022 June 1, 2022
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6.2.3 Fuel Escalation Rates

The average annual escalation rates in Table 10 were used in this study. The electricity and natural gas rates are based on assumptions from the CPUC 2021 En Banc hearings on utility costs through 2030 (California Public Utilities Commission, 2021a). Escalation rates through the remainder of the 30-year evaluation period are based on the escalation rate assumptions within the 2022 TDV factors.

Table 10: Real Utility Rate Escalation Rate Assumptions

Year	Statewide Natural Gas Average Rate (%/year, real)	PG&E Electric Average Rate (%/year, real)
2023	4.6%	1.8%
2024	4.6%	1.8%
2025	4.6%	1.8%
2026	4.6%	1.8%
2027	4.6%	1.8%
2028	4.6%	1.8%
2029	4.6%	1.8%
2030	4.6%	1.8%
2031	2.0%	0.6%
2032	2.4%	0.6%
2033	2.1%	0.6%
2034	1.9%	0.6%
2035	1.9%	0.6%
2036	1.8%	0.6%
2037	1.7%	0.6%
2038	1.6%	0.6%
2039	2.1%	0.6%
2040	1.6%	0.6%
2041	2.2%	0.6%
2042	2.2%	0.6%
2043	2.3%	0.6%
2044	2.4%	0.6%
2045	2.5%	0.6%
2046	1.5%	0.6%
2047	1.3%	0.6%
2048	1.6%	0.6%
2049	1.3%	0.6%
2050	1.5%	0.6%
2051	1.8%	0.6%
2052	1.8%	0.6%

6.2.4 Monthly Energy Use

Table 11: Climate Zone 3: 2,100 sqft Single Family Prototype

Month	2022 Base			NEEA Tier 3		NEEA Tier 4	
	Total Gas (therms)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)
1	13	778	597	959	778	954	773
2	13	586	335	763	511	756	505
3	15	389	50	577	238	571	232
4	14	369	-25	551	156	544	150
5	14	315	-135	475	25	470	20
6	13	293	-135	444	16	440	12
7	13	312	-102	470	56	467	53
8	13	320	-96	472	56	467	51
9	12	323	-41	469	106	463	100
10	13	358	52	519	213	513	207
11	14	426	177	607	358	602	354
12	15	713	498	924	708	914	699
Grand Total	162	5,184	1,177	7,229	3,221	7,163	3,155
Annual Cost	\$329		\$349		\$1,005		\$981

Total Elec: Total electricity use without any solar PV
 Net Elec: Net electricity use after solar PV is included

Table 12: Climate Zone 3: 2,700 sqft Single Family Prototype

Month	2022 Base			NEEA Tier 3		NEEA Tier 4	
	Total Gas (therms)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)
1	17	834	622	1,048	837	1,038	827
2	14	618	324	796	502	787	493
3	16	417	20	610	213	605	209
4	15	398	-63	584	122	575	113
5	17	373	-153	578	52	566	40
6	15	348	-153	519	18	515	14
7	15	365	-119	541	57	535	50
8	15	380	-106	551	64	544	57
9	13	377	-47	540	115	534	109
10	15	420	63	605	248	597	240
11	15	469	178	669	379	663	372
12	15	763	511	947	695	944	692
Grand Total	181	5,762	1,078	7,988	3,304	7,901	3,217
Annual Cost	\$ 372		\$ 336		\$ 1,046		\$ 1,015

Total Elec: Total electricity use without any solar PV
 Net Elec: Net electricity use after solar PV is included

Table 13: Climate Zone 4: 2,100 sqft Single Family Prototype

Month	2022 Base			NEEA Tier 3		NEEA Tier 4	
	Total Gas (therms)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)
1	13	672	480	848	655	843	650
2	13	543	290	714	461	707	455
3	15	375	34	556	215	551	210
4	14	375	-27	548	145	544	141
5	13	315	-134	467	18	462	13
6	12	335	-106	470	29	468	28
7	12	371	-103	507	33	506	32
8	12	401	-56	530	73	530	73
9	11	329	-69	457	59	456	58
10	12	353	34	503	184	501	182
11	13	404	153	576	325	573	322
12	14	641	423	845	626	837	619
Grand Total	155	5,113	918	7,019	2,825	6,978	2,784
Annual Cost	\$ 312		\$ 262		\$ 861		\$ 845

Total Elec: Total electricity use without any solar PV
 Net Elec: Net electricity use after solar PV is included

Table 14: Climate Zone 4: 2,700 sqft Single Family Prototype

Month	2022 Base			NEEA Tier 3		NEEA Tier 4	
	Total Gas (therms)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)	Total Elec (kWh)	Net Elec (kWh)
1	16	778	549	1,004	774	994	765
2	14	613	312	798	496	790	488
3	15	424	17	612	205	608	201
4	15	425	-55	605	125	598	117
5	16	375	-162	567	31	557	20
6	14	421	-105	578	52	574	48
7	14	456	-109	609	44	606	40
8	13	507	-38	651	106	650	105
9	12	387	-88	530	55	529	54
10	14	419	38	591	210	584	204
11	14	477	178	671	373	667	368
12	15	750	490	944	684	940	680
Grand Total	172	6,032	1,027	8,160	3,155	8,096	3,091
Annual Cost	\$ 353		\$ 321		\$ 995		\$ 972

Total Elec: Total electricity use without any solar PV
 Net Elec: Net electricity use after solar PV is included

Get In Touch

The adoption of reach codes can differentiate jurisdictions as efficiency leaders and help accelerate the adoption of new equipment, technologies, code compliance, and energy savings strategies.

As part of the Statewide Codes & Standards Program, the Reach Codes Subprogram is a resource available to any local jurisdiction located throughout the state of California.

Our experts develop robust toolkits as well as provide specific technical assistance to local jurisdictions (cities and counties) considering adopting energy reach codes. These include cost-effectiveness research and analysis, model ordinance language and other code development and implementation tools, and specific technical assistance throughout the code adoption process.

If you are interested in finding out more about local energy reach codes, the Reach Codes Team stands ready to assist jurisdictions at any stage of a reach code project.



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