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CALIFORNIA ENERGY CODES & STANDARDS
A STATEWIDE UTILITY PROGRAM

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2022 CODE CYCLE:

Custom Cost Effectiveness Analysis: City of Glendale - Single Family

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SDGE A Sempra Energy utility
SOUTHERN CALIFORNIA EDISON Energy for What's Ahead
PG&E Pacific Gas and Electric Company

Legal Notice

Acronym List

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

GWP – Glendale Water and Power

IOU – Investor-Owned Utility

POU – Publicly Owned Utility

PG&E – Pacific Gas & Electric (utility)

SCE – Southern California Edison (utility)

SCG – Southern California Gas (utility)

SDG&E – San Diego Gas & Electric (utility)

CPAU – City of Palo Alto Utilities

LADWP – Los Angeles Department of Water and Power

kWh – Kilowatt Hour

NPV – Net Present Value

PV - Solar Photovoltaic

TDV - Time Dependent Valuation

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

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

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.

The California Building Energy Efficiency Standards Title 24, Part 6 (Title 24) (CEC, 2019) is maintained and updated every three years by two state agencies: the California Energy Commission (the Energy Commission) and the Building Standards Commission (BSC). In addition to enforcing the code, local jurisdictions have the authority to adopt local energy efficiency ordinances—or reach codes—that exceed the minimum standards defined by Title 24 (as established by Public Resources Code Section 25402.1(h)2 and Section 10-106 of the Building Energy Efficiency Standards). Local jurisdictions must demonstrate that the requirements of the proposed ordinance are cost-effective and do not result in buildings consuming more energy than is permitted by Title 24. In addition, the jurisdiction must obtain approval from the Energy Commission and file the ordinance with the BSC for the ordinance to be legally enforceable.

This report is an addendum to the *2022 Single Family New Construction Cost-effectiveness Study* modified to accurately represent the City of Glendale, California. The study analyzes cost-effectiveness of measures and measure packages that exceed the minimum state requirements, the 2022 Building Energy Efficiency Standards, effective January 1, 2023, in newly constructed buildings. This report 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.

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 studies referenced above except for the energy costs are calculated using local Glendale Water and Power (GWP) utility rates. Measure packages include combinations of energy efficiency, electrification, solar photovoltaics (PV), and battery storage with results evaluated for California Climate Zones 9 and 16.

This report presents measures or measure packages that local jurisdictions may consider adopting to achieve energy savings and emissions reductions beyond what will be accomplished by enforcing minimum state requirements, the 2022 Building Energy Efficiency Standards (Title 24, Part 6), effective January 1, 2023.

Local jurisdictions may also adopt ordinances that amend different Parts of the California Building Standards Code or may elect to amend other state or municipal codes. The decision regarding which code to amend will determine the specific requirements that must be followed for an ordinance to be legally enforceable. Although a cost-effectiveness study is only required to amend Part 6 of the CA Building Code, it is important to understand the economic impacts of any policy decision. This study documents the estimated costs, benefits, energy impacts and greenhouse gas emission reductions that may result from implementing an ordinance based on the results to help residents, local leadership, and other stakeholders make informed policy decisions.

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

2 Methodology and Assumptions

The Reach Codes Team analyzed two residential prototype designs to represent a variety of common building types using the cost-effectiveness methodology detailed in this section below. The general methodology is consistent with analyses of other prototypes, whereas some specifics such as utility rate selection are customized for the City of Glendale rates.

2.1 Reach Codes

This section describes the approach to calculating cost-effectiveness including benefits, costs, metrics, and utility rate selection.

2.1.1 Benefits

This analysis used both on-bill and time dependent valuation (TDV) of energy-based approaches to evaluate cost-effectiveness. Both on-bill and TDV require estimating and quantifying the energy savings and costs associated with energy measures. The primary difference between on-bill and TDV is how energy is valued:

- On-Bill: Customer-based lifecycle cost approach that values energy based upon estimated site energy usage and customer on-bill savings using electricity and natural gas utility rate schedules over a 30-year duration for residential and 15 years for nonresidential designs, accounting for a three percent discount rate and energy cost inflation per Appendix 7.2.3.
- TDV: TDV was developed by the Energy Commission to reflect the time dependent value of energy including long-term projected costs of energy such as the cost of providing energy during peak periods of demand and other societal costs including projected costs for carbon emissions and grid transmission impacts. This metric values energy use differently depending on the fuel source (gas, electricity, and propane), time of day, and season. Electricity used (or saved) during peak periods has a much higher value than electricity used (or saved) during off-peak periods.

The Reach Codes Team performed energy simulations using the most recent software available for 2022 Title 24 code compliance analysis, CBECC-Res v1.0.

2.1.2 Costs

The Reach Codes Team assessed the incremental costs and savings of the energy packages over the lifecycle of 30 years for the single family and ADU buildings. Incremental costs represent the equipment, installation, replacements, and maintenance costs of the proposed measure relative to the 2019 Title 24 Standards minimum requirements or standard industry practices. The Reach Codes Team obtained measure costs from manufacturer distributors, contractors, literature review, and online sources such as Home Depot and RS Means. Taxes and contractor markups were added as appropriate. Maintenance and replacement costs are included.

2.1.3 Metrics

Cost-effectiveness is presented using net present value (NPV) and benefit-to-cost (B/C) ratio metrics.

- NPV: The Reach Codes Team uses net savings (NPV benefits minus NPV costs) as the cost-effectiveness metric. If the net savings of a measure or package is positive, it is considered cost effective. Negative net savings represent net costs to the consumer. A measure that has negative energy cost benefits (energy cost increase) can still be cost effective if the costs to implement the measure are even more negative (i.e., construction and maintenance cost savings).
- B/C Ratio: Ratio of the present value of all benefits to the present value of all costs over 30 years (NPV benefits divided by NPV costs). The criteria for cost-effectiveness is a B/C greater than 1.0. A value of one

indicates the savings over the life of the measure are equivalent to the incremental cost of that measure. A value greater than one represents a positive return on investment.

Improving the energy performance of a building often requires an initial investment. In most cases the benefit is represented by annual on-bill utility or TDV savings, and the cost by incremental first cost and replacement costs. However, some packages result in initial construction cost savings (negative incremental cost), and either energy cost savings (positive benefits), or increased energy costs (negative benefits). In cases where both construction costs and energy-related savings are negative, the construction cost savings are treated as the benefit while the increased energy costs are the cost. In cases where a measure or package is cost-effective immediately (i.e., upfront construction cost savings and lifetime energy cost savings), B/C ratio cost-effectiveness is represented by ">1". Because of these situations, NPV savings are also reported, which, in these cases, are positive values.

2.1.4 Utility Rates

In coordination with the City of Glendale, the Reach Codes Team determined appropriate tariffs for each package, summarized in Table 1, based on the annual load profile of the prototype and the corresponding package, and the most prevalent rate for each building type.

For a more detailed breakdown of the rates selected refer to Appendix 7.2 Utility Rate Schedules.

Table 1. Utility Tariffs in City of Glendale

Electric / Gas Utility	Electricity	Natural Gas
Residential (Single Family and Detached ADU)		
GWP / SoCalGas	L-1-A	GR

Utility rates are assumed to escalate over time, using assumptions detailed in Appendix 7.2. Please see the main *2022 Single Family New Construction Reach Code Cost Effectiveness Studies* for further details on methodology.

2.2 Greenhouse Gas Emissions

The analysis uses the greenhouse gas (GHG) emissions estimates built-in to CBECC-Res. There are 8760 hourly multipliers accounting for time dependent energy use and carbon emissions based on source emissions, including renewable portfolio standard projections. Natural gas fugitive emissions, which are shown to be substantial, are not included. There are two strings of multipliers—one for Northern California climate zones, and another for Southern California climate zones.[1].

[1] CBECC-Res multipliers are the same for CZs 1-5 and 11-13 (presumed to be Northern California), while there is another set of multipliers for CZs 6-10 and 14-16 (assumed to be Southern California).

3 Prototype Designs and Measure Packages

3.1 Residential Occupancies

Table 2 describes the basic characteristics of each residential prototype design. The prototypes have equal geometry on all walls, windows and roof to be orientation neutral.

Table 2: Residential Prototype Characteristics

Characteristic	Single Family One-Story	Single Family Two-Story	ADU
Conditioned Floor Area	2,100 ft^2	2,700 ft^2	625 ft^2
Num. of Stories	1	2	1
Num. of Bedrooms	3	3	1
Window-to-Floor Area Ratio	20%	20%	20%

The Reach Codes Team evaluated three packages for mixed fuel homes and five packages for all-electric homes for each prototype and climate zone, as described below.

1. All-Electric Code Minimum: This package meets all the prescriptive requirements of the 2022 Title 24 Code.
2. Efficiency Only: This package uses only efficiency measures that don't trigger federal preemption issues including envelope and water heating or duct distribution efficiency measures.
3. Efficiency + NEEA (Preempted): This package was evaluated for the all-electric homes only and shows an alternative design that applies water heating equipment that is more efficient than federal standards meeting the NEEA Tier 3 rating. The Reach Codes Team considers this more reflective of how builders meet above code requirements in practice.
4. Efficiency + PV: Using the Efficiency Package as a starting point, PV capacity was added to offset most of the estimated electricity use.
5. Efficiency + PV + Battery: Using the Efficiency & PV Package as a starting point, a battery system was added. For mixed-fuel homes the package of efficiency measures differed from the Efficiency Package in some climate zones to arrive at a cost effective solution.

4 Results

Results are presented as per the prototype-specific Measure Packages described in Section 4. Overarching factors impacting the results include:

- 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 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.'
- All-electric packages will have lower **GHG emissions** than equivalent mixed-fuel packages in all cases, due to the clean power sources currently available from California's power providers.
- The Reach Codes Team coordinated with the City of Glendale to select the most prevalent tariffs for each prototype given the annual energy demand profile. The Reach Codes Team **did not compare a variety of tariffs** to determine their impact on cost-effectiveness although utility rate changes or updates can effect on-bill cost-effectiveness results.

4.1 Residential Occupancies

Table 3 and Table 4 show results for the single family and ADU prototypes, respectively, for Climate Zone 9. Table 5 and Table 6 show results for the single family and ADU prototypes, respectively, for Climate Zone 16. Results are shown for all the evaluated packages. All packages are cost-effective based on TDV except for the mixed fuel Efficiency package in Climate Zone 9. All of the all-electric packages are On-Bill cost-effective with the exception of most of the Efficiency + PV + Battery cases.

Table 3. Climate Zone 9 Single Family 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
All-Electric												
Code Minimum	1.2	-1,513	85	0.3	($83)	($766)	($5,288)	($5,234)	6.8	$4,468	3.3	$3,179
Efficiency Only	4.6	-1,336	85	0.3	($55)	($109)	($4,093)	($3,893)	35.8	$3,784	102.1	$3,357
Efficiency + NEEA	6.3	-1,198	85	0.3	($34)	$387	($4,093)	($3,893)	>1	$4,280	>1	$4,073
Efficiency + PV	4.6	922	85	0.4	$284	$7,820	($478)	$942	8.3	$6,879	8.7	$6,238
Efficiency + PV + Battery	9.9	791	85	0.9	$265	$7,367	$5,011	$12,487	0.6	($5,120)	1.9	$10,710
Mixed Fuel												
Efficiency Only	3.6	147	4	0.0	$28	$695	$1,194	$1,341	0.5	($646)	1.2	$250
Efficiency + PV	3.6	922	4	0.1	$142	$3,376	$2,435	$3,001	1.1	$375	1.5	$1,229
Efficiency + PV + Battery	8.6	839	3	0.5	$129	$3,052	$7,509	$14,094	0.2	($11,043)	1.5	$5,914

Table 4. Climate Zone 9 ADU 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
All-Electric												
Code Minimum	0.6	-901	38	0.1	($84)	($1,383)	($3,216)	($2,908)	2.1	$1,525	1.6	$896
Efficiency Only	3.7	-837	38	0.1	($72)	($1,093)	($3,003)	($1,455)	1.3	$362	1.1	$53
Efficiency + NEEA	5.4	-747	38	0.1	($56)	($721)	($3,003)	($1,455)	2.0	$735	1.5	$367
Efficiency + PV	3.7	3,506	38	0.3	$596	$14,510	$3,949	$7,842	1.9	$6,668	1.9	$6,334
Efficiency + PV + Battery	8.8	3,490	38	0.7	$593	$14,454	$9,510	$19,483	0.7	($5,029)	1.5	$9,406
Mixed Fuel												
Efficiency Only	3.7	36	3	0.0	$13	$341	$256	$1,502	0.2	($1,160)	0.5	($780)
Efficiency + PV	3.7	922	3	0.2	$528	$12,384	$5,810	$8,929	1.4	$3,454	1.5	$4,195
Efficiency + PV + Battery	8.9	929	3	0.5	$530	$12,411	$11,361	$20,556	0.6	($8,145)	1.4	$6,682

Table 5. Climate Zone 16 Single Family 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
All-Electric												
Code Minimum	6.0	-4,314	404	1.5	($87)	$3,598	($3,257)	($2,954)	>1	$6,552	>1	$3,139
Efficiency Only	9.7	-4,027	404	1.6	($30)	$4,949	($1,943)	($1,479)	>1	$6,428	>1	$3,675
Efficiency + NEEA	10.9	-3,825	404	1.6	$8	$5,815	($1,943)	($1,479)	>1	$7,294	>1	$4,277
Efficiency + PV	9.7	1,331	404	1.8	$863	$25,810	$7,051	$10,549	2.4	$15,261	1.9	$8,576
Efficiency + PV + Battery	18.1	1,183	404	2.3	$839	$25,234	$12,497	$22,036	1.1	$3,198	1.6	$11,922
Mixed Fuel												
Efficiency Only	14.9	-106	119	0.7	$203	$6,564	$3,344	$3,755	1.7	$2,809	2.2	$4,123
Efficiency + PV	14.9	1,331	119	0.8	$420	$11,634	$5,756	$6,981	1.7	$4,653	1.9	$5,419
Efficiency + PV + Battery	22.6	1,235	115	1.2	$398	$11,066	$10,780	$18,007	0.6	($6,942)	1.5	$8,024

Table 6. Climate Zone 16 ADU 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
All-Electric												
Code Minimum	0.1	-1,807	122	0.4	($117)	($1,101)	($2,640)	($2,261)	2.1	$1,160	1.0	$22
Efficiency Only	8.8	-1,508	122	0.5	($63)	$157	($2,749)	($1,170)	>1	$1,328	9.9	$748
Efficiency + NEEA	12.8	-1,400	122	0.5	($44)	$605	($2,749)	($1,170)	>1	$1,776	>1	$1,580
Efficiency + PV	8.8	3,669	122	0.7	$760	$19,406	$5,941	$10,452	1.9	$8,954	1.7	$6,200
Efficiency + PV + Battery	16.4	3,629	122	1.0	$754	$19,266	$11,453	$22,027	0.9	($2,762)	1.4	$7,321
Mixed Fuel												
Efficiency Only	8.7	-2,966	87	0.4	$25	$1,673	$510	$1,787	0.9	($114)	1.0	$52
Efficiency + PV	8.7	1,331	87	0.5	$692	$17,251	$7,723	$11,433	1.5	$5,818	1.4	$4,505
Efficiency + PV + Battery	16.2	1,313	87	0.8	$689	$17,197	$13,234	$23,007	0.7	($5,809)	1.2	$4,937

5 Summary

The Reach Codes Team developed packages of energy efficiency measures as well as packages combining energy efficiency with solar PV generation, simulated them in building modeling software, and gathered costs to determine the cost-effectiveness of multiple scenarios. The Reach Codes Team coordinated with multiple utilities, cities, and building community experts to develop a set of assumptions considered reasonable in the current market. Changing assumptions, such as the period of analysis, measure selection, cost assumptions, energy escalation rates, or utility tariffs are likely to change results.

Table 7 (all-electric) and Table 8 (mixed fuel) summarize results for each prototype and depict the efficiency EDR2 compliance margins achieved for each climate zone and package. Because local reach codes 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 and Glendale electricity rates for both the single family and ADU prototypes. While the code compliant all-electric building had higher first year utility costs, the additional cost was small. Combining higher capacity PV systems and all-electric construction does reduce utility costs.

For a reach code that allows for mixed fuel buildings the mixed fuel efficiency, PV, and battery package was found to be cost effective based on TDV for both prototypes with EDR2 margins between 8.6 and 8.9 for Climate Zone 9 and 16.2 and 22.6 for Climate Zone 16.

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

Climate Zone	Single Family				ADU			
	Code Min	EE	EE+PV	EE+PV/Batt	Code Min	EE	EE+PV	EE+PV/Batt
CZ09	1.2	4.6	4.6	9.9	0.6	3.7	3.7	8.8
CZ16	6.0	9.7	9.7	18.1	0.1	8.8	8.8	16.4

Table 8: Summary of Mixed Fuel Efficiency EDR2 Margins and Cost-Effectiveness

Climate Zone	Single Family			ADU		
	EE	EE+PV	EE+PV/Batt	EE	EE+PV	EE+PV/Batt
CZ09	3.6	3.6	8.6	3.7	3.7	8.9
CZ16	14.9	14.9	22.6	8.7	8.7	16.2

6 References

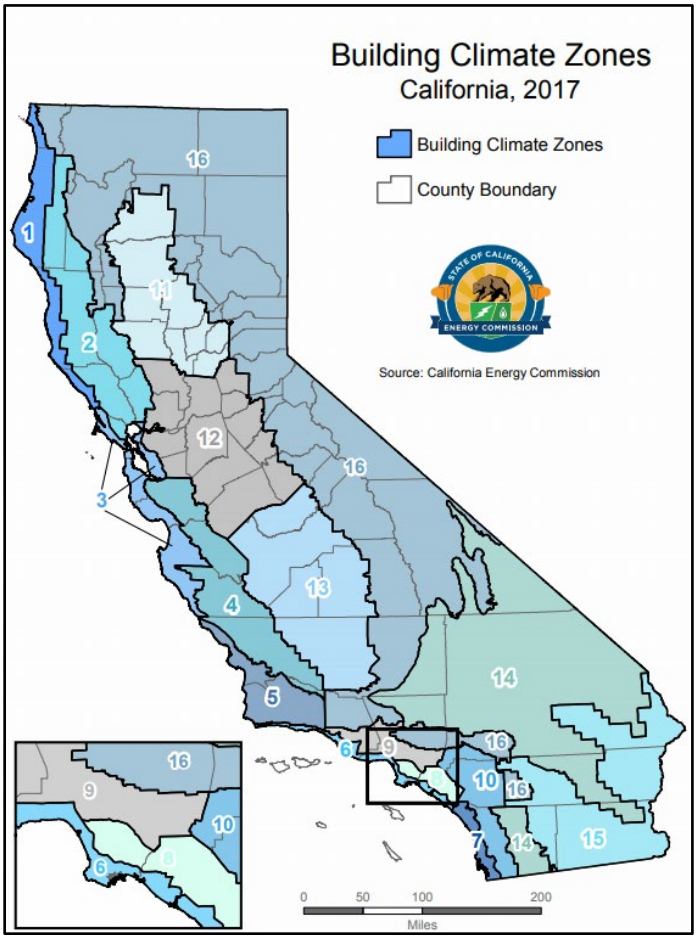
California Public Utilities Commission. (2021a). *Utility Costs and Affordability of the Grid of the Future: An Evaluation of Electric Costs, Rates, and Equity Issues Pursuant to P.U. Code Section 913.1.* Retrieved from https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/office-of-governmental-affairs-division/reports/2021/senate-bill-695-report-2021-and-en-b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

7 Appendices

7.1 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.



7.2 Utility Rate Schedules

The Reach Codes Team used the City of Glendale tariffs detailed below to determine the On-Bill savings for each package.

7.2.1 Glendale Water and Power

7.2.1.1 Residential

Following in Table 9 are the City of Glendale electricity tariffs applied in this study. L-1-D was applied to most of the scenarios which included on-site solar generation. L-1-A was applied to the ADU baseline and efficiency packages which did not include solar PV.

Table 9. L-1-A Standard Service Rate and L-1-D Customer Owned Generation Standard2

Customer Charge - per meter per day	$0.57
Energy Charges - per kWh	
July through October (High Season)	
First 10kWh per day	$0.1648
Next 10kWh per day	$0.2042
Remaining kWh	$0.2439
November through June (Low Season)	
First 10kWh per day	$0.1381
Next 10kWh per day	$0.1711
Remaining kWh	$0.2111

The following reflects the details for the net energy metering (NEM) arrangement applied in this analysis per Resolution No. 18-183. A NEM compensation rate of $0.0991/kWh was applied based on information provided by City of Glendale staff.

[2] https://www.glendaleca.gov/government/departments/glendale-water-and-power/rates/residential-electric-rates

GWP offers a Net Energy Metering (NEM) program for eligible renewable energy customers (primarily solar) within the City of Glendale. Participants in the net energy metering program generate renewable energy on their property and use a portion of that energy onsite for their energy needs. If the customer's renewable facility generates more power than the customer can use onsite during a one-year term, then that customer may annually elect to receive either payment or a credit (i.e., kWh) on his or her utility bill for the excess energy that he or she generates.

California law provides that Glendale must accept NEM customers until the total combined rated generating capacity of renewable electrical generating facilities reaches five percent of GWP's aggregate customer peak demand. At this time, GWP has reached its NEM cap and is no longer obligated by law to offer NEM. However, due to the popularity of the NEM program and its potential for offering reductions in demand, GWP does not recommend discontinuing the NEM program at this time.

Based upon feedback from customers during the last annual election period, GWP recommends amending to the NEM Regulations to make it easier for customers to claim excess credits or compensation. Currently, and consistent with California law, the City's NEM Regulations require customers that are net generators to annually elect whether they wish to receive compensation in the form of a kWh credit or a payment. GWP recommends amending this requirement to allow customers to make the election to receive a kWh credit or compensation one time, rather than needing to do so every year. This will reduce the administrative burden on GWP staff and will make it easier for customers as well. Per California law, and as is the current policy, customers that fail to make an election will forfeit the right to receive a kWh credit or compensation.

GWP continues to review its distributed generation policies and programs and will continue to bring additional amendments and regulatory changes to the City Council as appropriate in order to facilitate GWP's clean energy strategy.

Annualized Payment/ Settlement Method

a) **Eligible Net Energy Metering Customers Receiving Residential Electric Service (L-1), Small Commercial Electric Service (L-2) and Small Commercial Demand Service (LD-2) Customers Under a Customer-Owned Generation Rate Schedule**

1) The annual Net Energy Metering calculation shall be made by measuring the difference between the energy supplied to the Customer and the energy generated by the Customer and fed back to GWP's grid over a Twelve-Month Period. At the end of each Twelve-Month Period, GWP shall determine if the Customer was a net consumer or a net generator of energy during the Twelve-Month Period. In the event that the energy supplied by GWP during the Twelve-Month Period exceeds the energy generated by the Customer during that same period, the Customer is a net energy consumer.

2) If a Customer is a net energy consumer, GWP will bill the Customer for the net energy consumed during the Twelve-Month Period based on the Customer's rate schedule and Customer shall pay for such net energy consumed, and other applicable charges in accordance with the Customer regular billing statement and the Glendale Municipal Code, 1995.

7.2.2 SCG

Refer to the statewide study 2022 Single Family New Construction Cost-effectiveness Study for details on the gas rates applied. The SoCalGas baseline territory of 1 was applied in both Climate Zones 9 and 16.

7.2.3 Fuel Escalation Rates

7.2.3.1 Residential Occupancies

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. No data was available to estimate electricity escalation rates for GWP, therefore electricity escalation rates for SCE and statewide natural gas escalation rates were applied.

Table 10: Real Utility Rate Escalation Rate Assumptions

Year	Statewide Natural Gas Average Rate (%/year, real)	SCE Electric Average Rate (%/year, real)
2023	4.6%	1.6%
2024	4.6%	1.6%
2025	4.6%	1.6%
2026	4.6%	1.6%
2027	4.6%	1.6%
2028	4.6%	1.6%
2029	4.6%	1.6%
2030	4.6%	1.6%
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%

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.

Visit LocalEnergyCodes.com to access our resources and sign up for newsletters

Contact info@localenergycodes.com for no-charge assistance from expert Reach Code advisors

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